GROUP & INDIVIDUAL LEARNING

BDS2 Semester 1 Exam Review

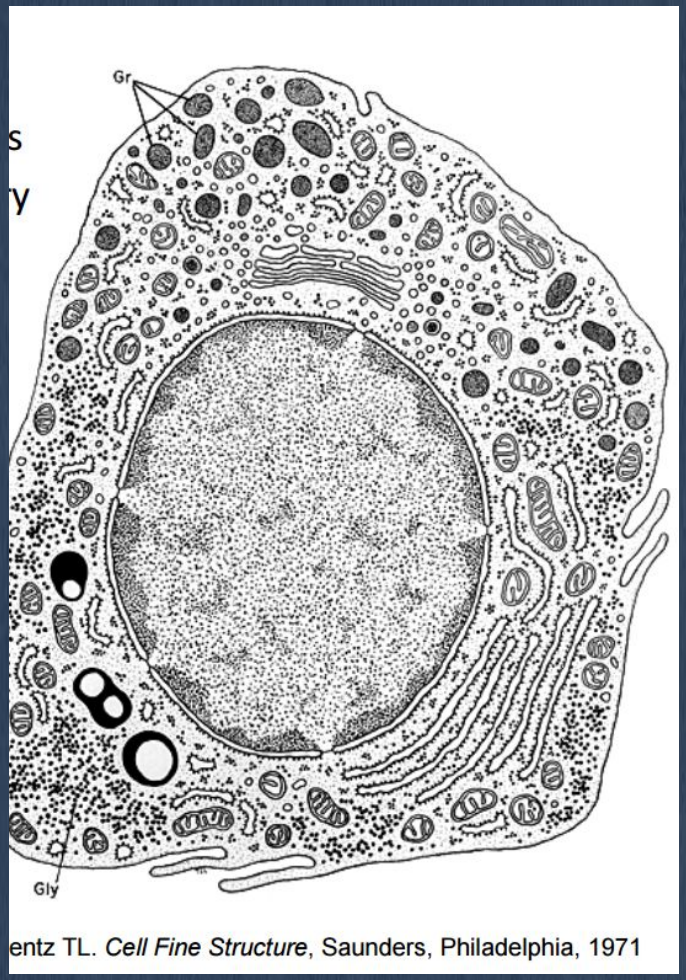
audss
ADELAIDE UNIVERSITY DENTAL STUDENTS' SOCIETY

BOQ SPECIALIST

Endocrinology

- Endocrine cells release hormones that regulate activity of target cells.
- Types of hormones: proteins + glycoproteins, small peptides, amino acids/amines, steroids.

Hydrophilic Hormones → typically doesn't secrete a large amount.



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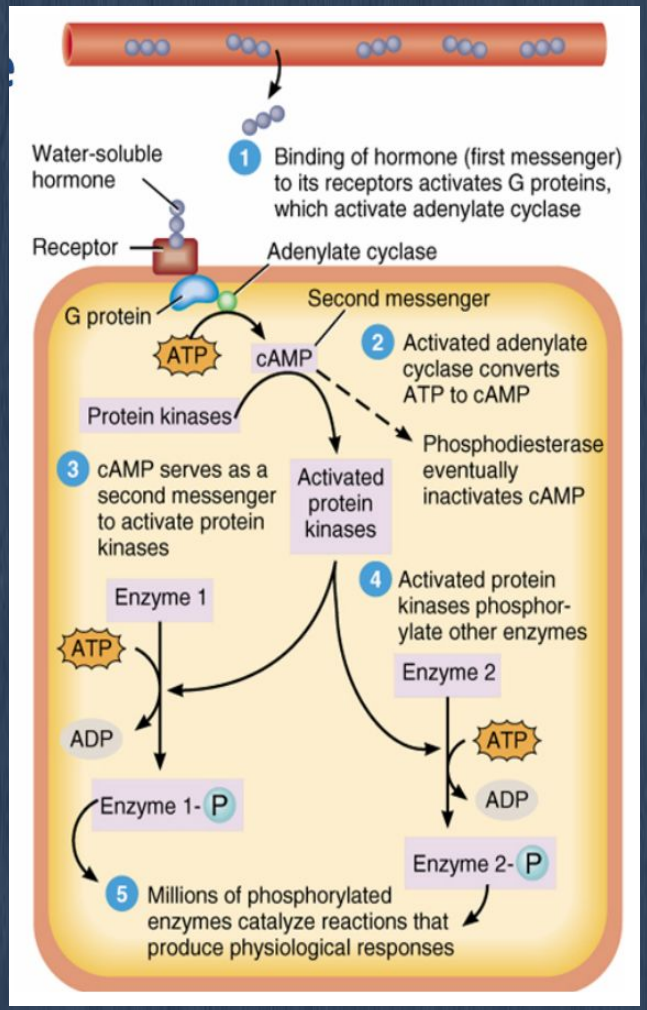
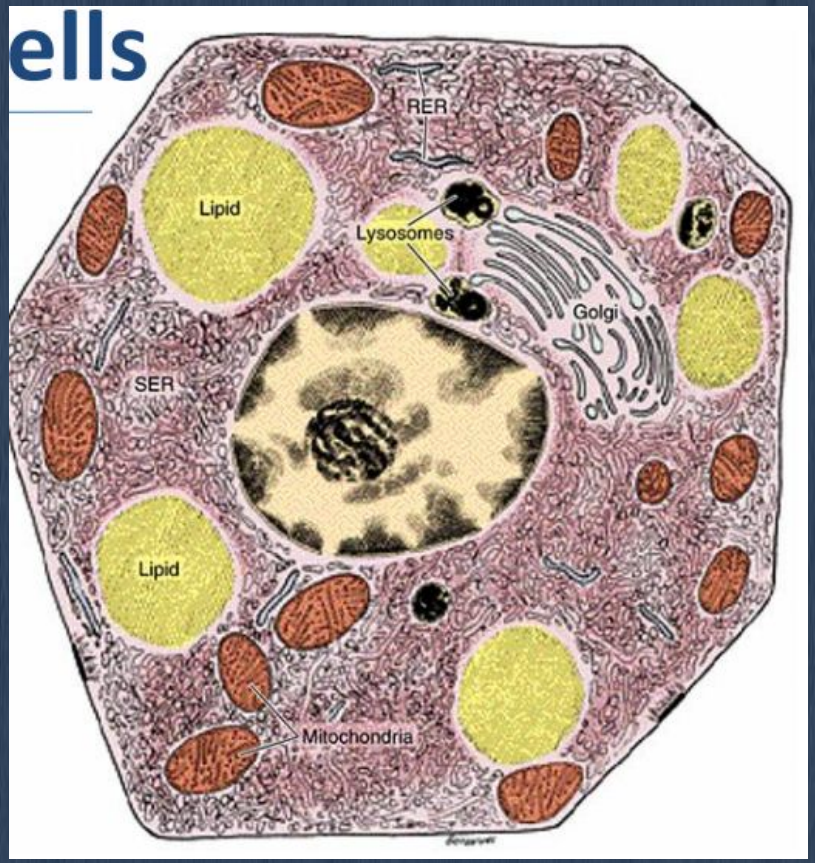


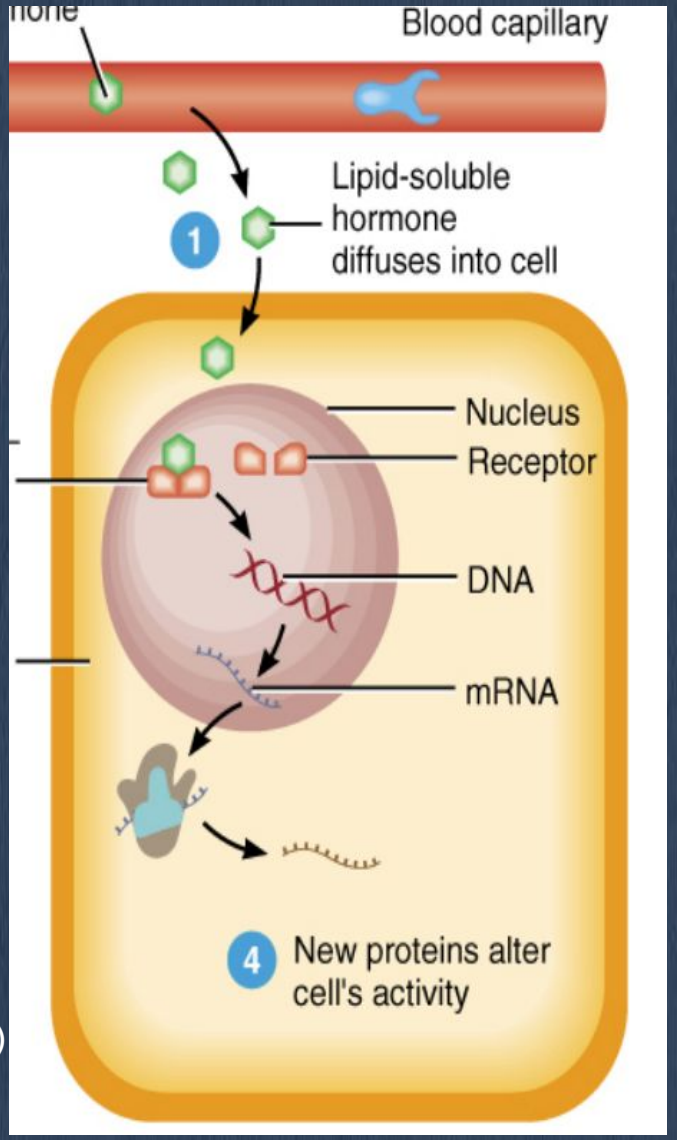
(Beckett, 2015)

Hormones

Lipophilic hormones: steroid and thyroid hormones

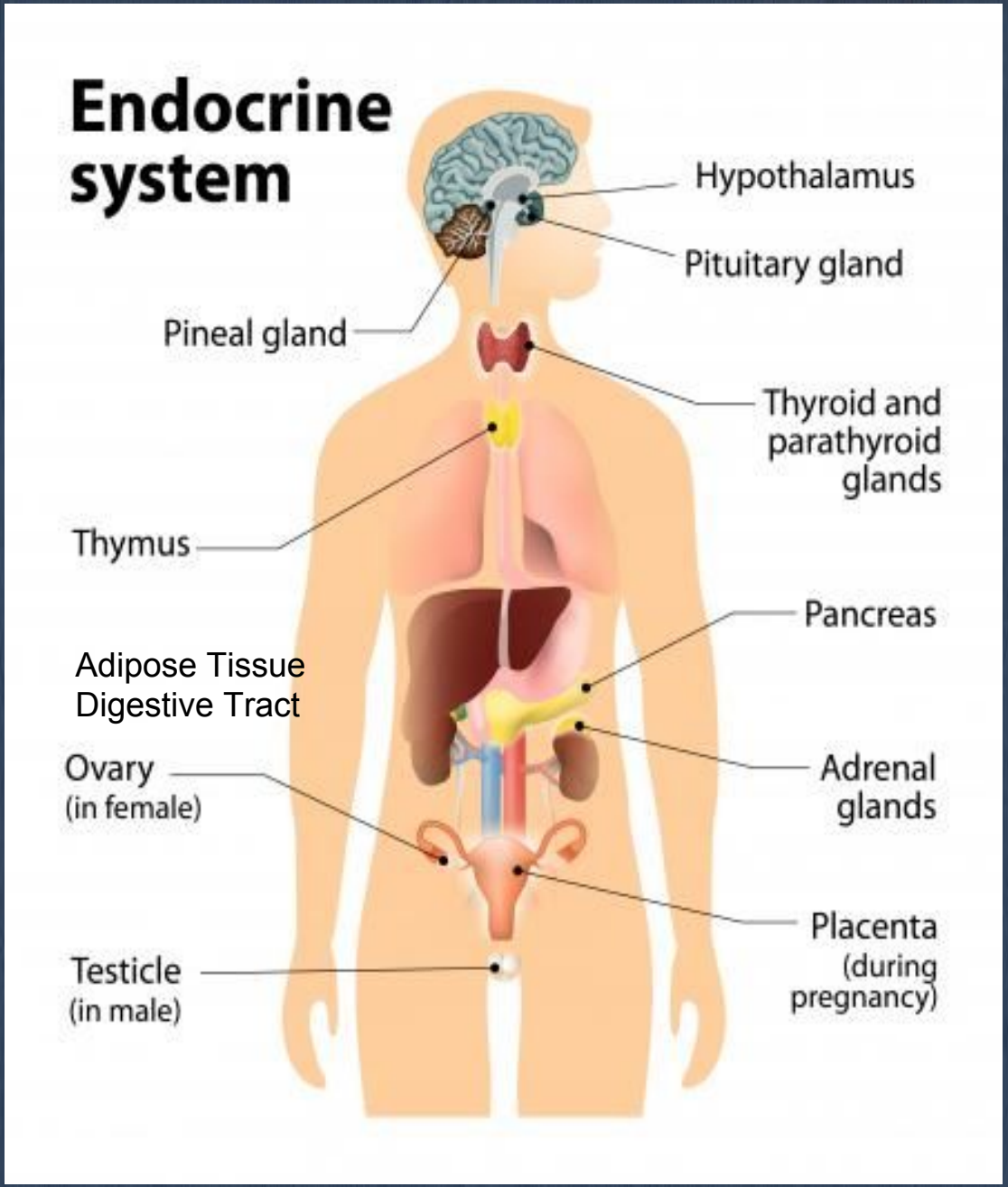


(Beckett, 2015)



Which produces what?

Refer to Sherwood for detailed table of hormones.



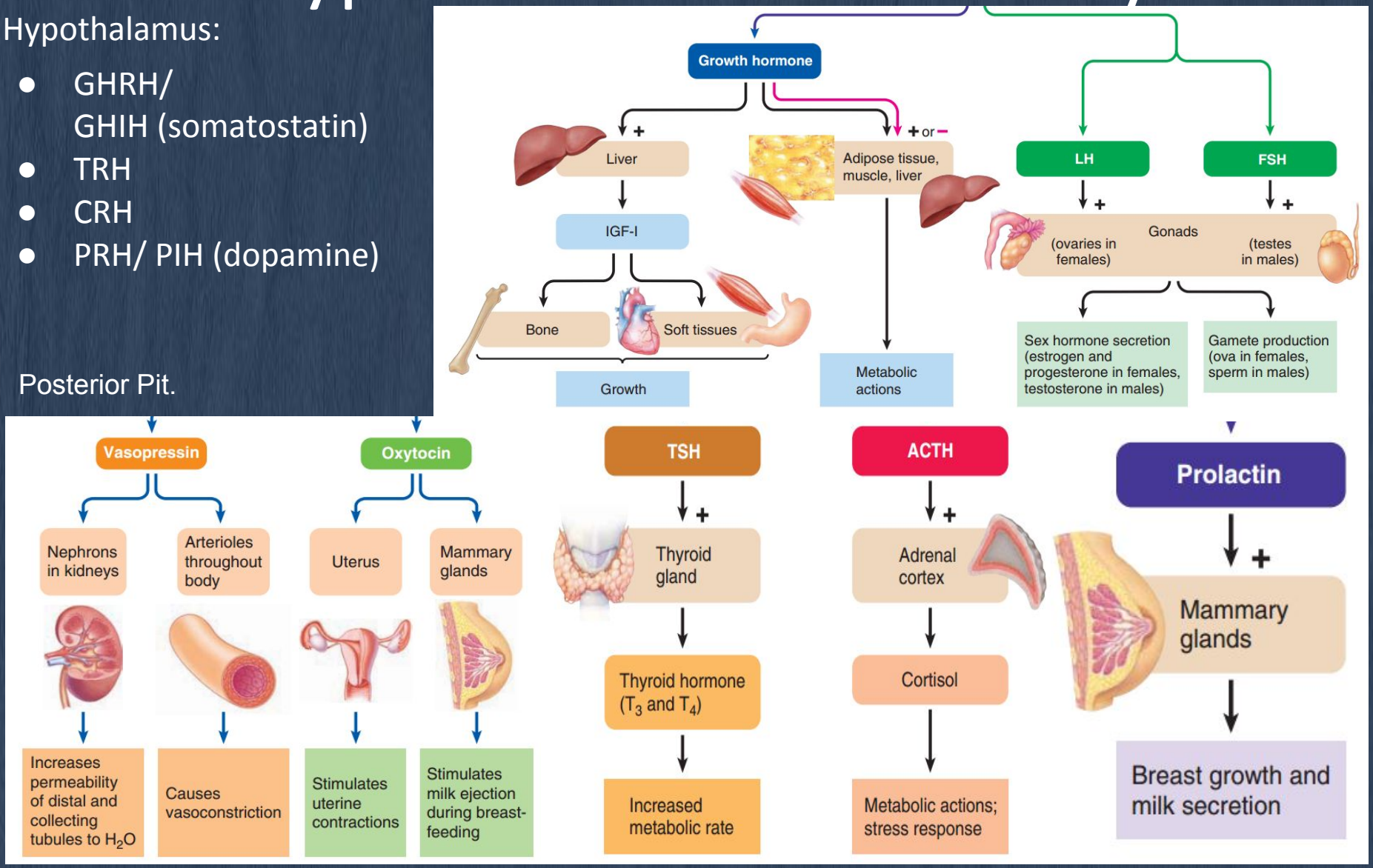
https://www.epa.gov/sites/production/files/styles/medium/public/2015-08/endocrine-system.jpg

Hypothalamus & Pituitary

Hypothalamus:

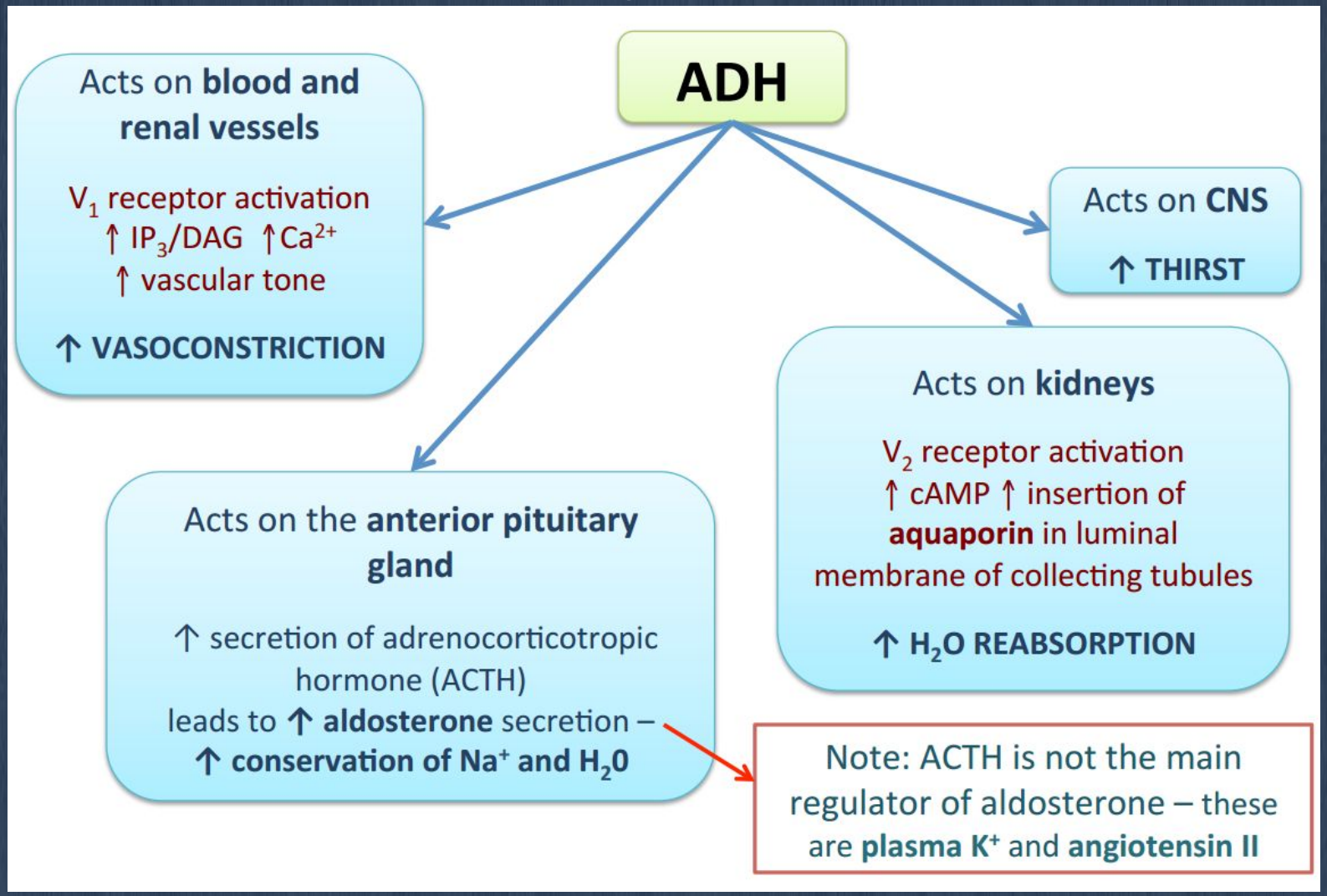
- GHRH/
  GHIH (somatostatin)
- TRH
- CRH
- PRH/ PIH (dopamine)

Posterior Pit.



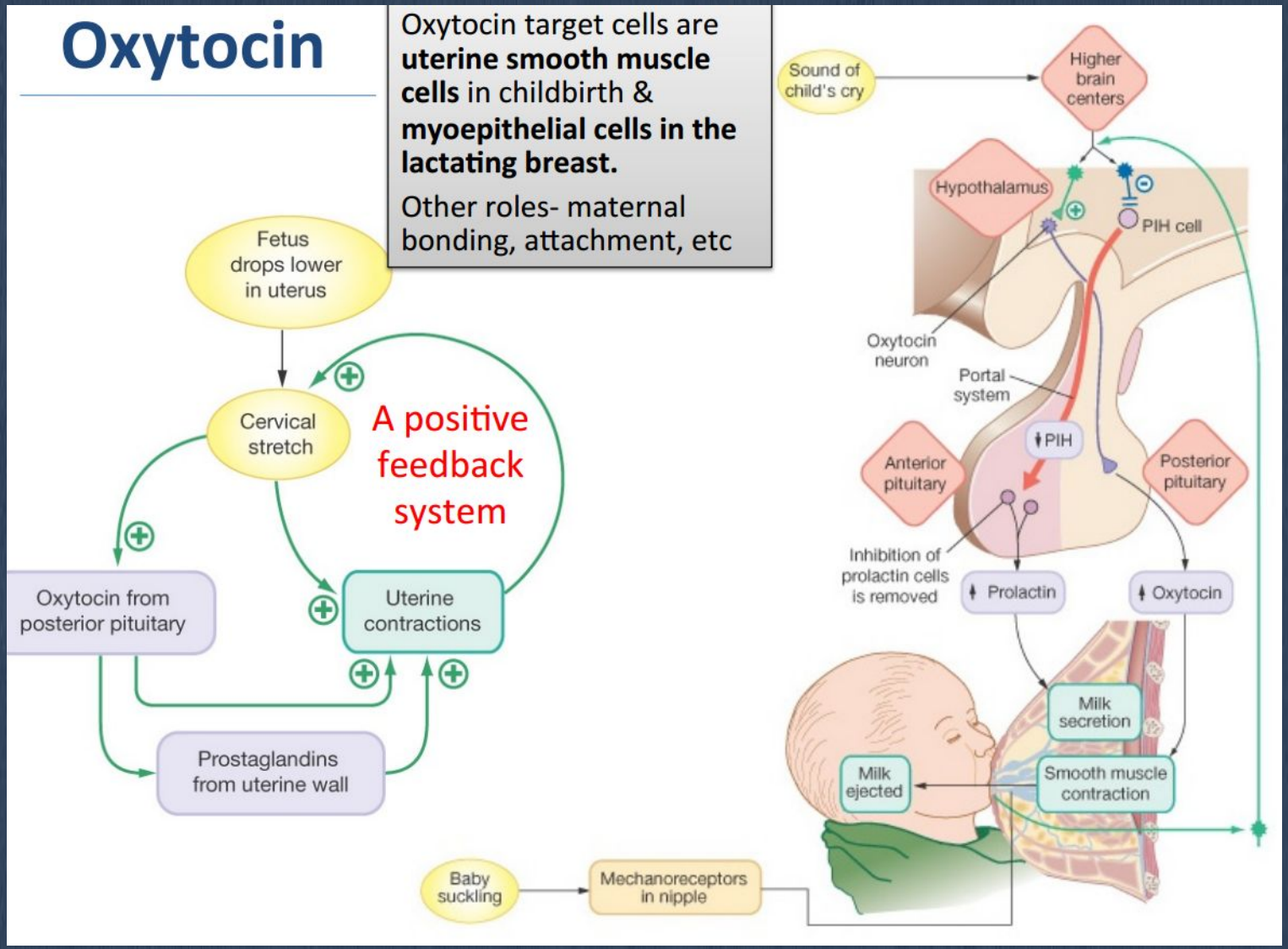
(Beckett, 2015)

Vasopressin



(Beckett, 2015)

Oxytocin - +ve feedback loop



(Beckett, 2015)

Metabolism

Metabolic Process	Reaction	Consequence
Glycogenesis	Glucose → glycogen	↓ Blood glucose
Glycogenolysis	Glycogen → glucose	↑ Blood glucose
Gluconeogenesis	Amino acids → glucose	↑ Blood glucose
Protein synthesis	Amino acids → protein	↓ Blood amino acids
Protein degradation	Protein → amino acids	↑ Blood amino acids
Fat synthesis (lipogenesis)	Fatty acids & glycerol → triglycerides	↓ Blood fatty acids
Fat degradation (lipolysis)	Triglycerides → fatty acids & glycerol	↑ Blood fatty acids

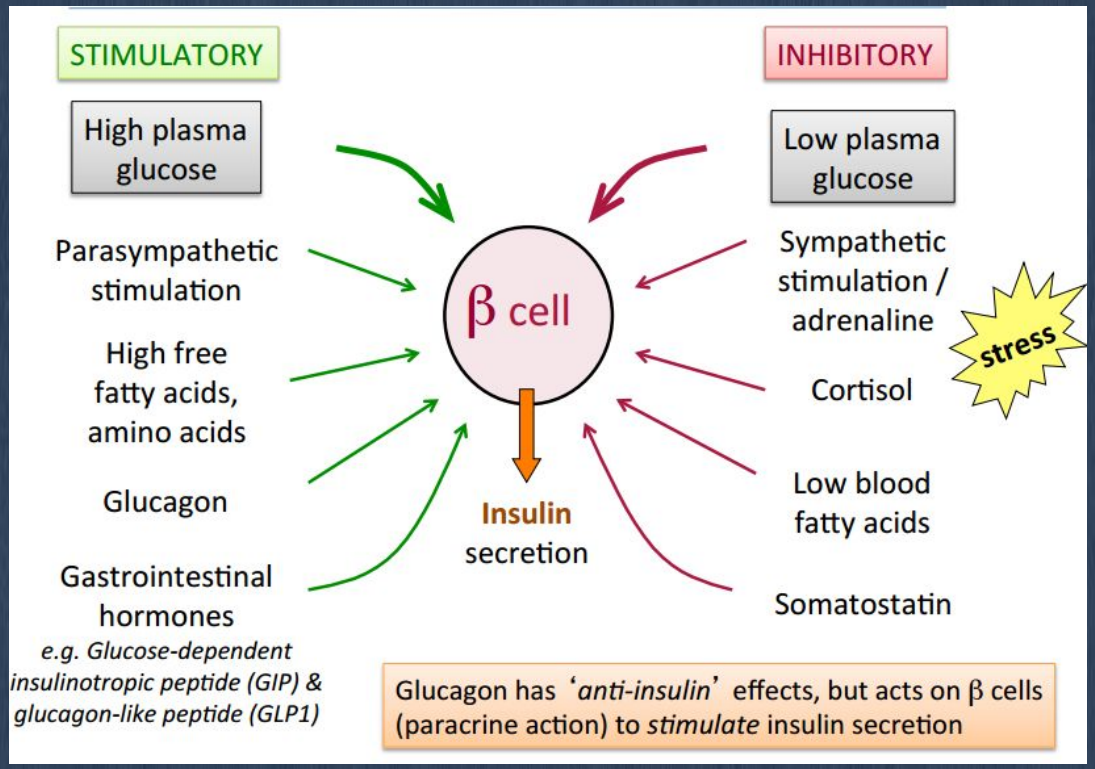
(Beckett, 2015)

Absorptive state: glucose main energy source

Post-Absorptive state

Insulin - Decreased Blood glucose in A.S Glucagon - Increase blood glucose in P.S

Insulin and Glucagon



(Beckett, 2015)

The effect of the hormone e.g. Insulin promotes uptake of glucose, ^metabolic use of glucose.

Know what stimulates and inhibits hormone secretion

Action of inhibiting hormone will just be the opposite effects: e.g. Glucagon - decreases glycogen synthesis and promotes breakdown of stored glycogen, stimulates gluconeogenesis etc.

Diabetes Mellitus

- Know diff btw the 2 types of DM
- Systemic complications of DM
  - ^ risk of heart attack, stroke, kidney disease, retinopathy, ischemia, gangrene of the limbs, Hypertensino, Artherosclerosis .
- Oral complications of DM
  - ^ risk of caries
  - Slow/impaire healing
  - Salivary gland dysfunction
  - ^ prev of perio
  - ^ bone loss
  - Opportunistic infections
- Dental management of DM pt

Feature	Type 1	Type 2
Usual age at onset	< 20 years	> 40 years
Onset	rapid	slow
Body mass	low (wasted)	obese
Plasma insulin	low or absent	variable
Plasma glucagon	high, can be suppressed	high, resistant to suppression
Plasma glucose	increased	increased
Insulin sensitivity	normal	reduced
Therapy	insulin	weight loss, drugs, insulin

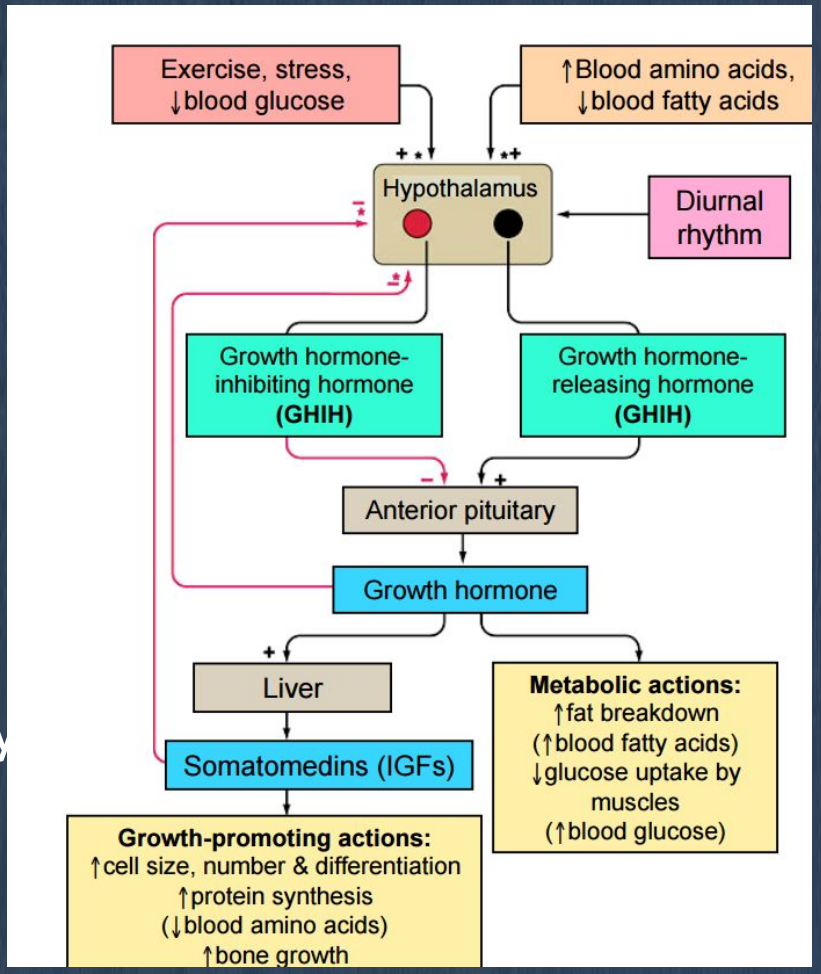
(Beckett, 2015)

Growth Hormone

IGF-1

IGF-2

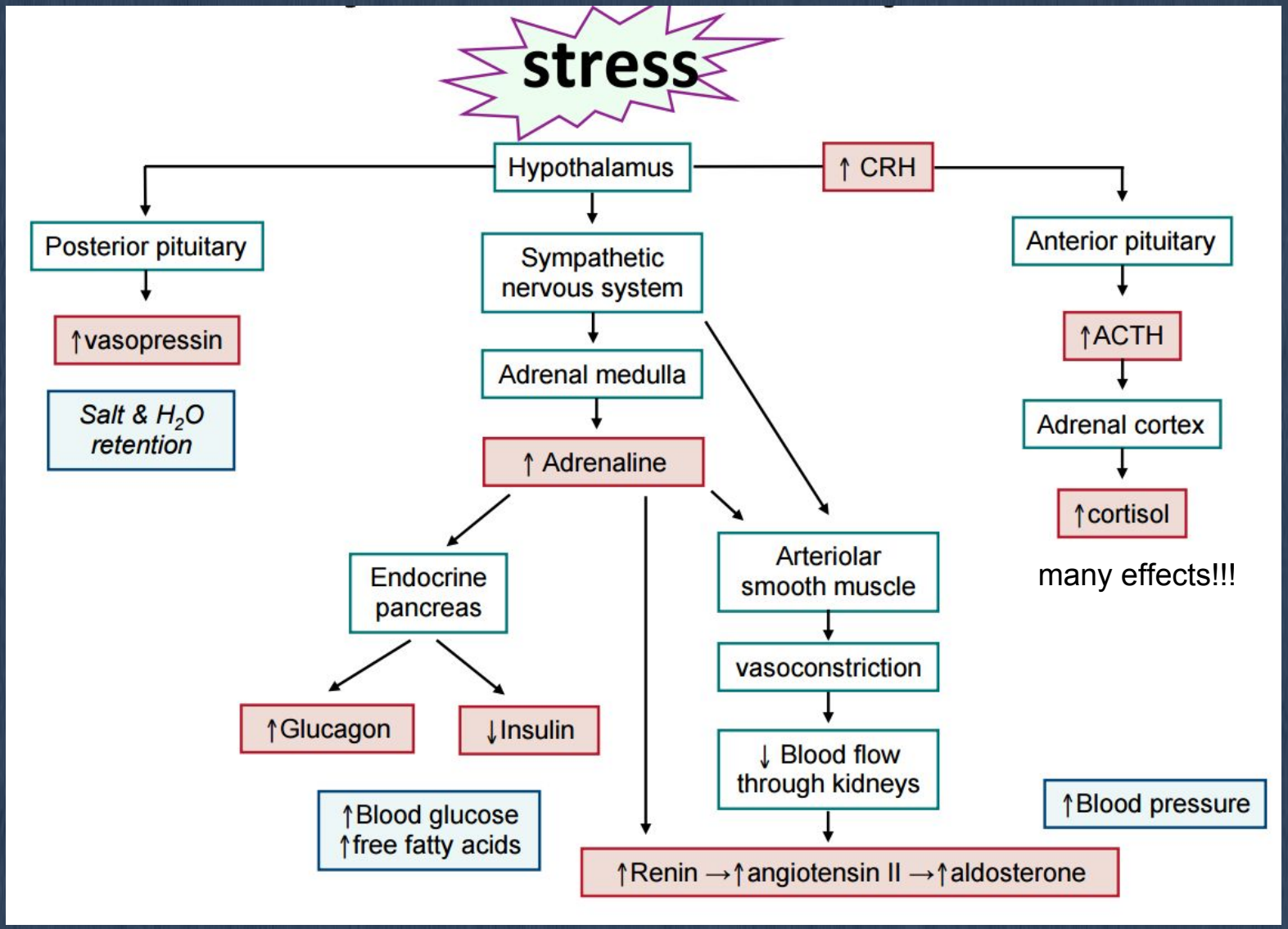
- Effects: Hyperplasia, hypertrophy, ^ protein synthesis, ^ bone growth ^ fat breakdown (^ amino acid), ^ glucose from liver
- Hormones influencing growth (TH, insulin, androgens, glucocorticoids)
- Excess GH → gigantism or acromegaly
- Deficient GH → pituitary dwarfism



(Beckett, 2015)

Stress

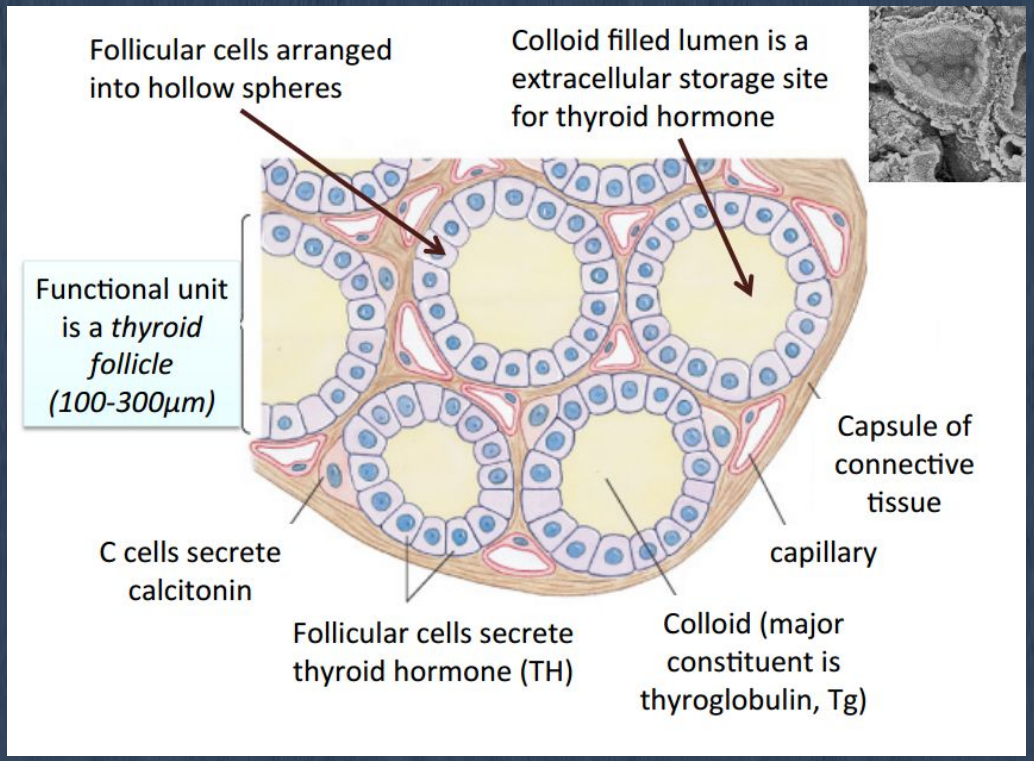
- Alarm reaction, resistance stage, exhaustion → short term and longer term responses



(Beckett, 2015)

Thyroid Hormones

- Acts on most cells in the body, ^ boost energy metabolism
- Understand process of TH synthesis
- Many effects of TH
- Hypothyroidism, and hyperthyroidism
  - Oral manifestations of both
  - Dental management: prior, during and after treatment



(Beckett, 2015)

Calcium regulation

Regulated by:

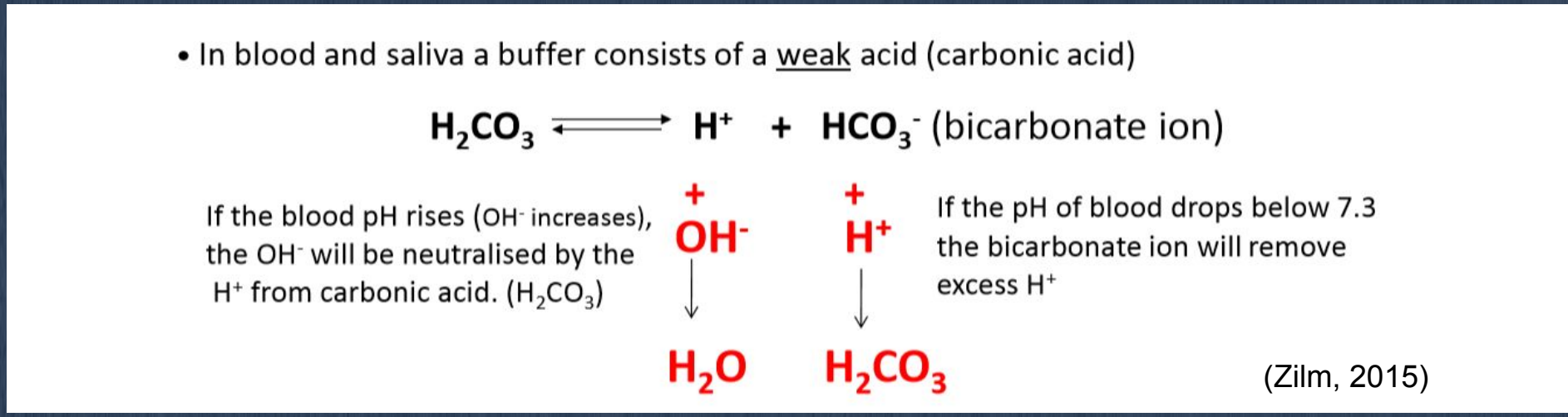
- PTH:
  - Promotes bone dissolution,^ reabsorption of Ca in kidney, ^ absorption of Ca in intestines ⇒ ^ Ca in circulation
  - Enhance activation of Vit D
  - Indirectly stimulates osteoclast activity
- Calcitonin:
  - Decreases plasma Ca - inhibit osteoclastic activity, decrease reabsorption in kidney
- Vit D:
  - promotes intestinal absorption of Ca and PO4
- Hyperparathyroidism
- Hypoparathyroidism
- Vit D Deficiency

Pregnancy

- Hormonal changes
- Effect on:
  - blood - ^RBC, ^clotting factors, ^fibrinogen,
  - heart - ^ CO, ^ HR, ^ SV, decrease vascular resistance
  - renal - ^ GFR
  - respiratory - ^ O2, decrease pCO2
  - GI - taste altered, reduced gastric secretion, nausea & vomiting
  - Insomnia, hyperpigmentation,
  - Oral health:
    - Erosion,^ caries risk - grazing, pregnancy gingivitis (2nd trim)
    - Delay tx til 2nd trimester, semi-supine
    - Supine hypotensive syndrome (constriction of vena cava)

Saliva

- **Buffering**



(Zilm, 2015)

- Phosphates
- Proteins
- Carbonic anhydrase
- What happens if pH was high/low?

Specific & non-specific host defence factors of the mouth

Non-specific Defence Factor	Main Function
Saliva flow, mucins/agglutinins	Physical removal of micobes
Lysozyme	Bacterial cell lysis
Lactoferrin	Iron sequestration
Apo-lactoferrin	Cell killing
Sialoperoxidase system	Hypothiocyanite, or Hypocyanous acid (HOSCN)
Histatins	Antifungal (Some anti-bacterial) activity
Defensins (α & β)	Antimicrobial & immuno-modulatory activity
Cystatins, SLPI	Cysteine, serine & metallo-protease inhibitors
Chitinase & chromogranin	Antifungal
Cathelicidin & Calprotectin	Antimicrobial
Specific Defence Factor	
Intra-epithelial lymophocytes & Langerhans cells	Cellular barrier to penetrating bacteria and antigens
sIgA	Prevent microbial adhesion
IgG, IgA & IgM	Prevent microbial adhesion, opsonins, activators
Complement	Activates neutrophils
Neutrophils/Macrophages	Phagocytosis

(Gully, 2015)

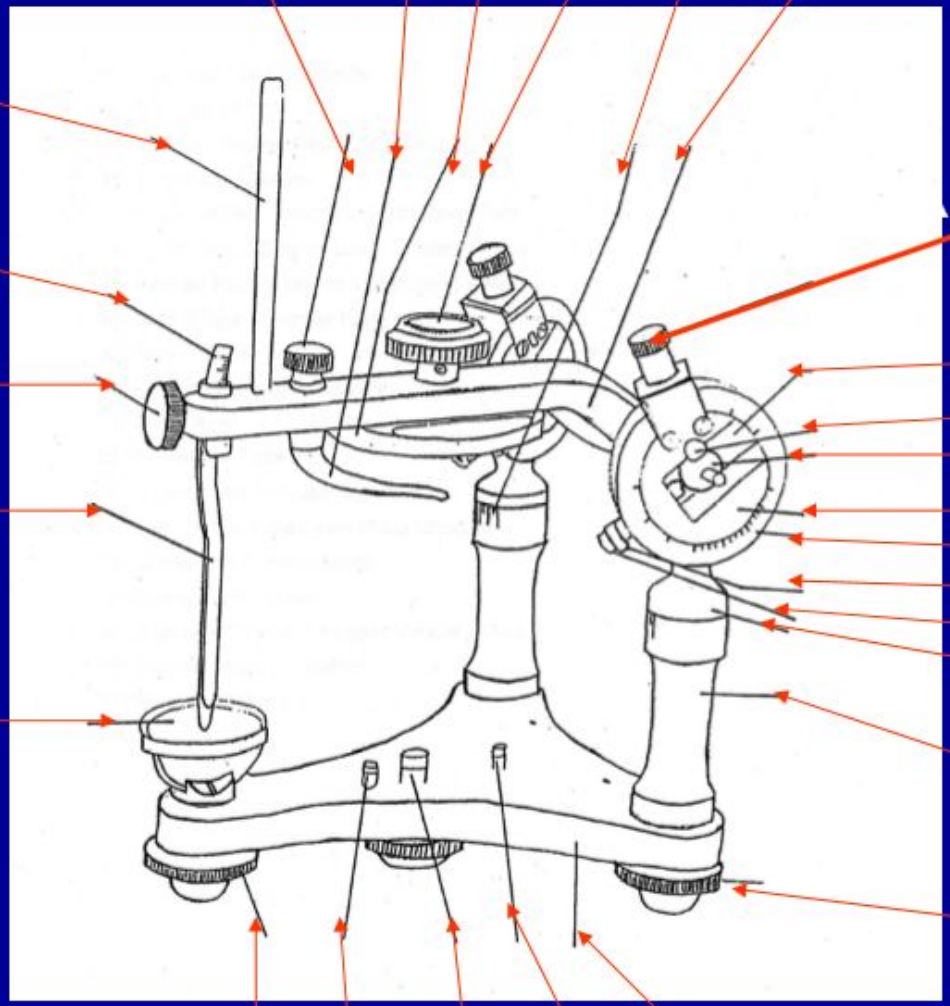
Genetics

- Cell Cycle
- Mitosis, meiosis
- Population genetics
- p+q=1
- P^2+2pq+q^2=1
- Terminologies in lectures
  - pleiotropy, epistasis

Occlusion

- Know your facebows and articulators
- Definitions from the glossary
- Angle's Molar Classifications
- Variations in the bite - crossbites, scissor, open bite.
- midline shifts, arch shape etc
- Tooth contacts

Get to know the appropriate parts



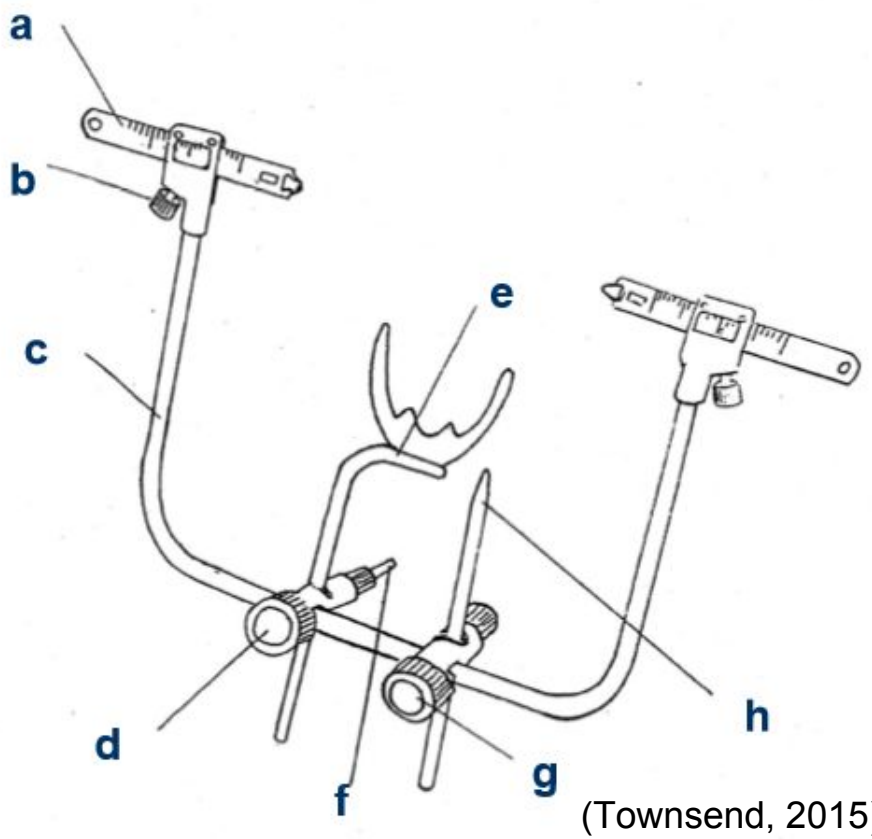
See sheet

On My Uni

(Townsend, 2015)

1 Set Screws for Horizontal Condylar Inclination (HCI)
2 Condylar Track
3 Lock Screw for Condylar Sphere
4 Condylar Sphere
5 Condylar Track Assembly
6 HCI Calibration (see 1)
7 Larger Anterior Stop Screw for Condylar Sphere
8 Smaller Anterior Stop Screw for Condylar Sphere
9 Condylar Assembly Holder
10 Condylar Post
11 Lock Nut for Bennett-Angle Setting
12 Lower Jaw Member
13 Posterior Positioning Pin for Mounting Plate
14 Attachment Screw for Lower Mounting Plate
15 Anterior Positioning Pin for Mounting Plate
16 Lock Screw for Incisal Table
17 Incisal Table
18 Calibrated Curved Incisal Pin
19 Lock Screw for Incisal Pin
20 Incisal Pin Calibration
21 Support Rod for Upper Jaw Member
22 Lock Nut for Orbital Axis Plane Indicator
23 Orbital Axis Plane Indicator
24 Zinc Mounting Plate
25 Attachment Screw for Upper Mounting Plate
26 Bennett-Angle Calibration
27 Upper Jaw Member

Facebow



(Townsend, 2015)

Main Components of Face-bows

a	Calibrated condylar rod
b	Set screw for calibrated condylar rod
c	Face-bow frame
d	Locking clamp for bite fork
e	Bite fork
f	Anterior jack screw
g	Locking clamp for orbital pointer pin
h	Orbital pointer pin

Gingivitis

- Cardinal signs of inflammation⟶ Link signs and symptoms to physiological change
  - Redness: prolif of BV in inflammation
  - Oedema: due to ^ permeability of BV
  - Heat
  - Pain
  - Loss of function
  - BOP - ulceration of JE
  - Retracability of gingiva: destruction of collagen fibres.
- Gingival biotypes (
- Recession - types of recession (Stilman's cleft & McCall's festoon)
- Treatment planning - always include preventive and periodontal care! (unless not indicated somehow…)

Radiology

Given a radiograph

- Critique the radiograph
  - film position
  - cone position
  - cone cut
  - horizontal/vertical angulation
  - Quality
  - Diagnostic value
- Interpretation of radiograph
  - teeth present
  - restorations
  - decay, anomalies, bone loss etc
- OPGs - dental age

BDS2 LEVEL

- Teeth
- Caries
- Periodontal assessment
- Assessment of roots
- Assessment of unerupted teeth
- Alveolar bone and other bony structures

https://i.ytimg.com/vi/PU3hrmEjOfI/hqdefault.jpg

(Ranjitkar *et al.,* 2002)

What do you see?

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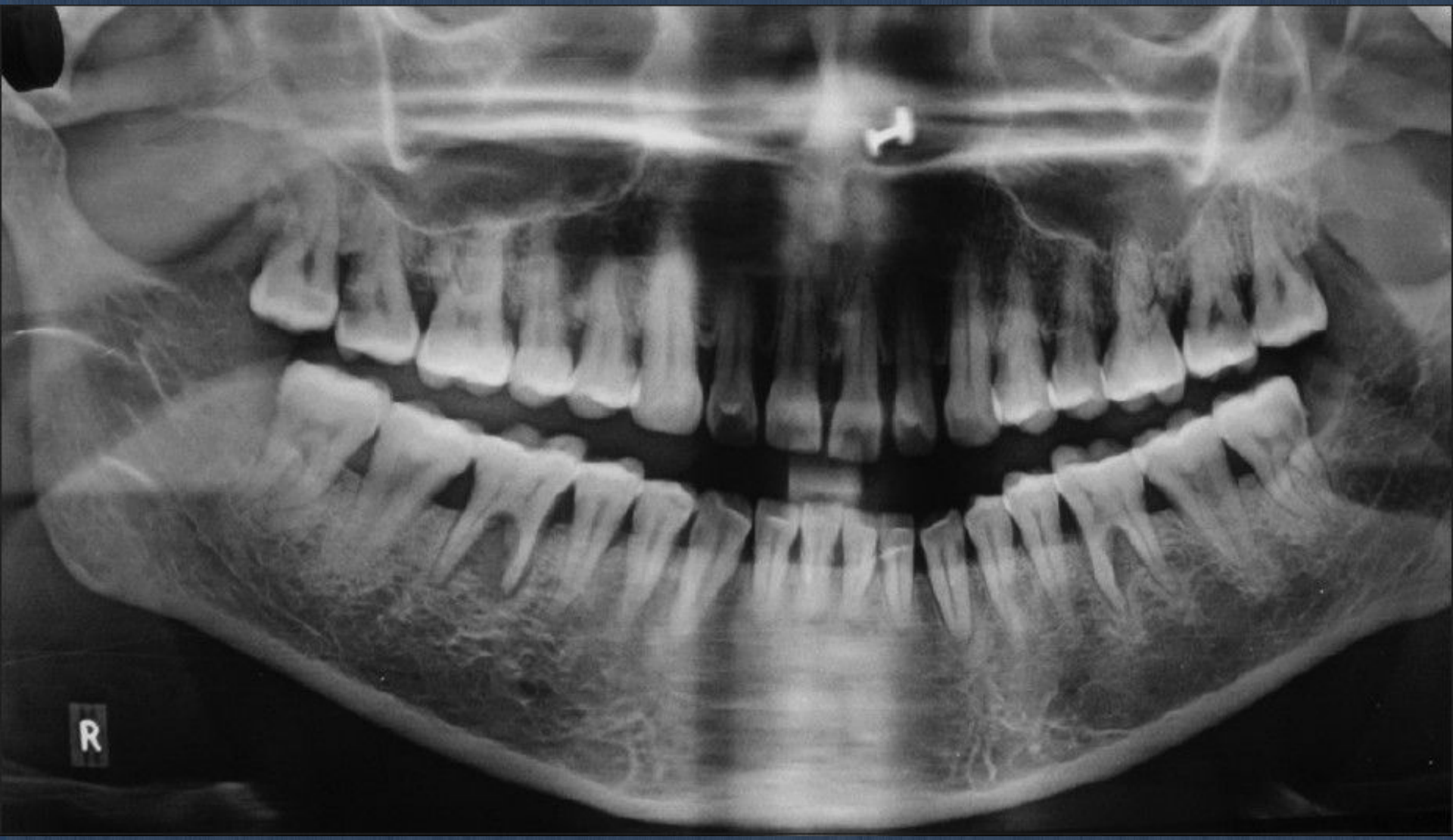

http://medind.nic.in/jay/t13/i1/JIndianSocPeriodontol_2013_17_1_128_107489_f3.jpg

EBD

- Type 1 error
  - false positive
- Type 2 error
  - false negative
- Relative risk
- odds ratio
- Confidence intervals
- Statistical significance ($P<0.05$)
- sensitivity vs specificity

Hierarchy of study designs

Researcher's role in study	Study design	...provides evidence about
Observation	Case report/series	New/unusual conditions
	Cross-sectional survey	Disease frequency
	Case-control study	Etiology
	Cohort study	Etiology and risk
Intervention	Non-experimental	Prognosis
	Experimental (randomized controlled trial = RCT)	Efficacy of therapy/ prevention

Strength of evidence for making treatment recommendations

Dental Anxiety & Fear Management

- Planning gradual treatment increments (simplest tx first)
- Relaxation:
  - progressive muscle relaxation
  - Controlled breathing/diaphragmatic breathing
- Tell-show-do
- Behavioural modelling (for children)
- Control enhancement
  - Predictability
  - Controllability
- Guided imagery (consider time mgmt)
- Distraction
- Positive reinforcement
- Systematic desensitisation

ILA Scenarios

ILA 2.1- Mr. Ivanovski, diabetes

ILA 2.2- Geoff Tritton, CLP

ILA 2.3- Keith Benham, AI

ILA 2.4- Mrs. Stevenson, medications, white lesion, menopause

Other topics not covered

- Metals in dentistry
  - Types of corrosion, clinical significance, electrical conductivity of metallic restorations
- Harford and Skinner lectures -
  - Diff btw anxiety and fear, acute vs chronic stress, whether these can be managed immediately.
  - PCC - Hx taking, explaining findings, OH advice
  - Social history and social deteminant of health
- Kaidonis lectures on caries, MI, materials.
- Tooth wear
- Embryology - link to CLP
- Tooth Development + Dental Anomalies

Dental Anomalies to Google later….

- Amelogenesis Imperfecta (3 types: hypoplastic, hypomaturation, hypocalcification)
  - Differential diagnosis consider fluorosis and chronological hypoplasia
- Dentine defects:
  - Dentinogenesis Imperfecta
  - Shell teeth
  - Dentinal dysplasia
  - Regional Odontodysplasia
- Disturbances to tooth no.
  - Decrease: hypodontia, anodontia
  - Increase: supernummerary teeth, supplemental teeth, odontomes
- Morphological abnormalities
  - Fusion, gemination, concrescence
  - dilaceration
  - Dens in dente, dens evaginatis.