

Hypercalcemia

Definition: Above normal levels of calcium (Ca^{2+}) in the blood

Risk factors & causes: Hyperparathyroidism or malignancy

Signs & symptoms:

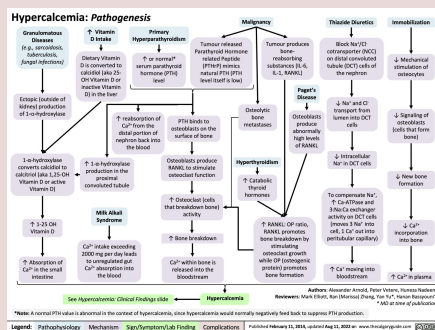
- Cognitive dysfunction
- Fatigue
- Muscle weakness
- Constipation
- Decreased appetite
- Polyuria (↑ urination)
- Polydipsia (excessive thirst)

Pathophysiology & mechanism: Changes in Ca^{2+} concentration in the blood cause alterations in the balance of electrical charges of cell membranes leading to sluggish neuronal activity $\rightarrow \downarrow \text{Ca}^{2+}$ causes a $\downarrow$ in the permeability of collecting duct membrane in the nephrons $\rightarrow \downarrow \text{Ca}^{2+}$ leads to increase in Na/Cl into tubule lumen (nephrons) with osmotic effects $\rightarrow$ leads to less water reabsorbed into the blood; & more water eliminated in the urine

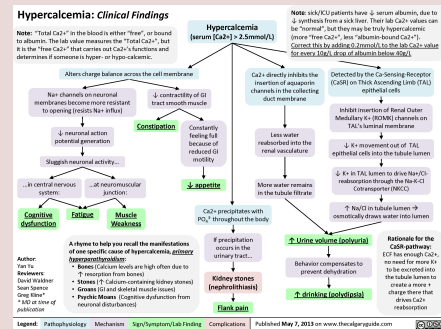
Complications: Ca deposition in different parts of the body causing stones (urolithiasis), flank pain (not specific)

Treatment: Medication & surgery

Hypercalcemia



Hypercalcemia (contnd)



Osteoporosis

Definition: Imbalance of bones formation & reabsorption leading to brittle bones

Risk factors & causes:

- Females more likely
- Age
- White or Asian
- FHx
- Small body frames

Pathophysiology & mechanism: In osteoporosis imbalance in bone reabsorption vs bone formation leading to a ↓ in bone density & bone mass → ↓ serum concentrations of vitamin D lead to a decrease in Ca²⁺ available for the mineralisation of bone

Signs & symptoms:

- Pain (from fractures & other conditions associated with osteoporosis)
- Postural changes
- Fractures
- Loss of height

Complications: Bone fractures (mainly spine & hips)

Treatment: Prevention - Supplements & weight bearing exercise

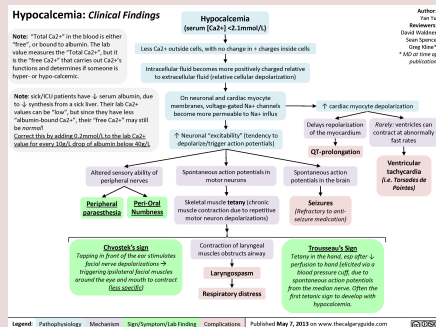
Hypocalcemia (cont)

Complications:

- Ventricular tachycardia
- Seizures
- Respiratory disease

Treatment: Iv infusion & medication

Hypocalcemia



Diabetes mellitus (cont)

Signs & symptoms: Depend on the specific body system affected

- Frequent urination
- Excessive thirst
- Unexplained weight loss
- Extreme hunger
- Sudden vision changes
- Tingling or numbness in the hands or feet
- Feeling very tired much of the time
- Very dry skin

Complications:

- Cardiovascular disease
- Nerve damage
- Kidney damage
- Eye damage
- Foot damage
- Skin & mouth conditions
- Hearing impairment

Treatment: Prevention - Healthy diet & exercise

Diabetes mellitus

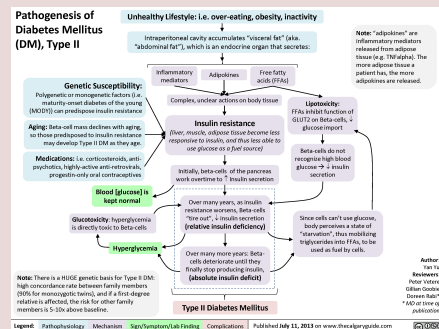
Definition: Body can't produce enough insulin (high blood sugar levels)

Risk factors & causes: Unhealthy lifestyle → intraperitoneal cavity accumulates visceral fat (endocrine organ that secretes 'bad' hormones)

Pathophysiology & mechanism: Manifested by a state of resistance to the effects of insulin, consequently →

- various organs are less able to use glucose as a source of energy
- There's hyperglycaemia leading to glucotoxicity, i.e. damage to pancreatic cell that produce insulin
- Deficient insulin causes diabetes

Diabetes mellitus



Hyperthyroidism

Definition: Thyroid creates excessive thyroid hormones → speeding up the body's metabolism

Risk factors & causes:

- Graves' diseases (attacks thyroid)
- Overactive thyroid nodules (toxic adenoma)
- Thyroiditis (inflamed thyroid)
- FHx
- Recent pregnancy

Hyperthyroidism (cont)

Pathophysiology & mechanism: ↑ in production of thyroid hormone → abnormal ↑ in its endocrine effects over various organs & systems
=> Includes ↑ cardiac output, gut hypermotility, CNS overstimulation, increased thermogenesis, ↑ in osmotic pressure behind the eyes & changes in the dermis & subcutaneous tissues

Signs & symptoms: May occur in various body systems → eyes / systemic signs / heart / nervous system / GI system / nutritional state / thermoregulation

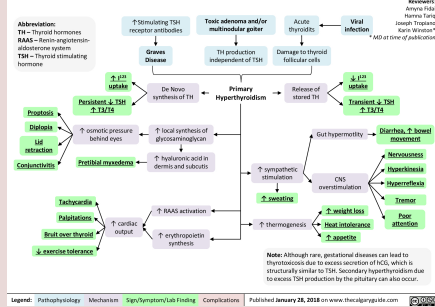
Complications:

- Cardiac problems
- Brittle bones
- Discoloured / swollen skin
- Vision problems

Treatment: Medicine, therapy &/or surgery

Hyperthyroidism

Primary Hyperthyroidism: Pathogenesis and clinical findings



Hypocortisolemia

Definition: Abnormal ↓ of cortisol in the blood → ↓ in the effects of cortisol on various systems of the body

Risk factors & causes: Cortisol is normally released in the blood in response to stress

Pathophysiology & mechanism: ↓ in circulating cortisol → generalised catabolic state, i.e. the body breaks down / burns tissues & reserves in order to release energy → most systems are affected

Signs & symptoms:

- Easy bruising
- Supraclavicular & dorsal fat pads
- Central obesity
- Round face
- Proximal muscle weakness
- Purple striae
- Hypertension
- Arrhythmia, paralysis, cramps
- Hirsutism, acne

Complications: Affects all the systems

Hypocortisolemia

