PHOSPHORUS

- Essential mineral.
    - 85% hydroxyapatite
    - 10-15% intracellular constituent.
    - ~1% in ECF → serum levels reflect poorly on total body stores.
- Essential for a variety of biochemical reactions (esp. formation of ATP).
- Serum Ca^{2+} & phosphate are ***inversely proportional.***
- Plasma phosphate levels demonstrate *diurnal variation*.
- Excreted predominately by urine.
    - Regulated by PTH (lowers phosphate by ↑ renal excretion).
    - ↑ resorption at proximal tubule with hypoparathyroidism, volume-depletion, hypocalcaemia & ↑GH.

HYPOPHOSPHATAEMIA.

- Unusual.
- Alkalosis (esp. 2* to hyperventilation) can cause significant hypophosphataemia.
- Also caused by:
    - Hyperparathyroidism
    - Malignancy (w/ hypercalcaemia)
    - Renal tubular defects
    - Phosphate-binder use.
    - Re-feeding syndrome.
    - Severe burns.

Symptoms & signs.

- Unlikely to occur until levels are quite low.
- Neuromuscular (weakness, tremor, paraesthesias, ↓DTR).
- Impaired myocardial function
- Haematological (↓PLT & WCC survival)

Treatment.

- Easily reversible by *correcting the underlying disorder & replacement phosphate.*
- Orally: milk !! and tablets.
- Intravenously (NaH2PO3 vs K2HPO3)
    - Slow replacement for people w/ renal impairment and hypercalcaemia,

HYPERPHOSPHATAEMIA.

- Likely due to reduced renal excretion or ↑PO3 movement *out of* cells.
- Symptoms generally result from the renal impairment or from hypocalcaemia or hypomagnesaemia.
- Treated by;
    - Addressing the underlying cause.
    - IV fluids
    - Acetazolamide
    - Phosphate binders.
    - Haemodialysis in severe cases.