Interpretation & Management of Hypercalcaemia & Hypocalcaemia

• PTH (or parathyroid hormone) is the main regulator of calcium homeostasis & is secreted by the parathyroid glands in response to low calcium levels
• Normal serum calcium ranges from 2.15-2.60mmol/L
• Abnormal calcium levels can be a medical emergency; if calcium >3.5mmol/L or <1.9mmol/L or severe symptoms consider hospital admission

Hypercalcaemia

Hypercalcaemia is common in primary care – the well-known adage “bones, stones, moans & abdominal groans” summarises the classical signs & symptoms of hypercalcaemia:
• Bone-related pain & complications e.g. osteomalacia
• Kidney stones
• Lethargy, fatigue, depression, cognitive impairment & ataxia
• Constipation, dyspepsia, nausea & vomiting

Causes:
• Primary hyperparathyroidism & malignancy account for around 90% of all cases
• Thyrotoxicosis
• Adrenal insufficiency
• Vitamin D intoxication
• Iatrogenic – thiazide diuretics & lithium
• Granulomatous disorders e.g. sarcoidosis

Hypocalcaemia

Chronic hypocalcaemia is often due to hypoparathyroidism or vitamin D deficiency but can also be iatrogenic e.g. bisphosphonate or denosumab therapy or due to low magnesium levels.

Hypocalcaemia is frequently asymptomatic, but symptoms & signs can include:
• Mood change, muscle spasm (e.g. carpo-pedal spasm) & tingling or numbness

If PTH low or undetectable:
exclude malignancy (including myeloma), thyrotoxicosis, Addison’s disease & Paget’s disease

If PTH normal or raised: likely hyperparathyroidism

Persistent hypercalcaemia >2.7mmol/L off any offending drugs or vitamin D preparations

Check serum PTH, U&Es

If PTH low or undetectable: exclude malignancy (including myeloma), thyrotoxicosis, Addison’s disease & Paget’s disease

If PTH normal with raised PTH & phosphate, likely pseudohypoparathyroidism (genetic PTH resistance)

If ALP normal with low/normal PTH & raised phosphate, likely hypoparathyroidism

If ALP normal with raised phosphate, check vitamin D levels & consider x-rays to exclude osteomalacia

Persistent hypocalcaemia <2.1mmol/L off any offending drugs

Check serum PTH, U&Es, LFTs, phosphate & magnesium