The duty biochemist can be contacted via switchboard (243 4343)

Hypercalcaemia in adults
Adj. Calcium >2.56 mmol/L

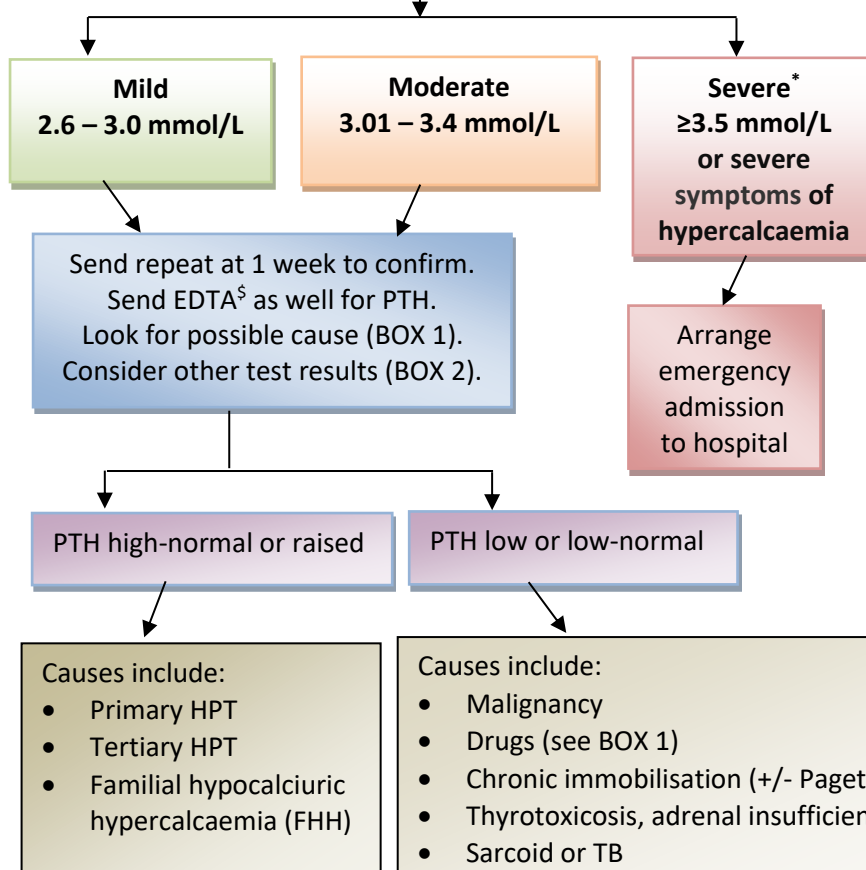*Results ≥3.5 mmol/L will be phoned to the GP surgery or collaborative

BOX 1
Possible causes include:
1. PHPT: May have history of renal stones or #.
2. Malignancy: Bone mets (e.g. breast, prostate), lung ca and myeloma.
3. Drugs: See below
4. ESRF or transplant: Suggesting tertiary HPT.
5. Chronic immobilisation (particularly in Paget's).
6. Dehydration (may be a cause or a symptom).
7. Thyrotoxicosis (rare cause)
8. Addison's (v. rare cause)
9. Sarcoidosis or TB (both rare).

Drugs: These include
1. Calcium supplements.
2. Thiazide diuretics.
3. Vitamin D analogues e.g. alfacalcidol, calcitriol.
4. Vitamin A toxicity.
5. Lithium$^\Delta$.
6. Calcium-containing antacids (or calcium supplements co-prescribed with antacids).
7. Vitamin D replacement with ergo- or cole- calciferol (**rare cause**)

Mild
2.6 – 3.0 mmol/L

Moderate
3.01 – 3.4 mmol/L

**Severe*
≥3.5 mmol/L
or severe symptoms of hypercalcaemia**

Send repeat at 1 week to confirm.
Send EDTA$^\$$ as well for PTH.
Look for possible cause (BOX 1).
Consider other test results (BOX 2).

Arrange emergency admission to hospital

BOX 2
1. Raised ALP
Can occur in bone mets, PHPT, Paget's.
2. Raised globulin
Can occur in myeloma[+].
3. Raised ESR
May suggest myeloma[+].
4. Anaemia
Chronic disease.
5. Low phosphate
May suggest PHPT.
6. TFT
Exclude thyrotoxicosis.

PTH high-normal or raised

PTH low or low-normal

Causes include:
- Primary HPT
- Tertiary HPT
- Familial hypocalciuric hypercalcaemia (FHH)

Causes include:
- Malignancy
- Drugs (see BOX 1)
- Chronic immobilisation (+/- Paget's)
- Thyrotoxicosis, adrenal insufficiency
- Sarcoid or TB

MANAGEMENT OF SEVERE OR SYMPTOMATIC HYPERCALCAEMIA (>3.40 mmol/L):
Admit immediately to hospital.
MANAGEMENT OF ASYMPTOMATIC, MILD OR MODERATE HYPERCALCAEMIA (≤3.40 mmol/L):
Suggested management by suspected cause:
- **Primary hyperparathyroidism or FHH**: Refer to an endocrinologist.
- **Malignancy**: Refer urgently under 2ww to the appropriate specialist.
- **Known CKD STAGE 4/5**: Refer to their renal specialist.
- **New renal failure** (?secondary to hypercalcaemia)**:** Consider admitting to hospital or referring them urgently to a renal specialist (depending on the symptoms and likely speed of onset).
- **Drugs**: Reduce or stop any causative or contributory drugs if appropriate and recheck the serum calcium at least 3 weeks after
  - **If the person is taking ergo- or colecalciferol,** check their vitamin D level. An elevated result suggests toxicity (a **rare** cause of hypercalcaemia). In such cases, it may take many weeks for the serum calcium to return to normal after discontinuing. If the vitamin D level is normal, look for another cause.
  - **If the person is taking lithium,** contact their mental health specialist to discuss whether to stop the lithium, monitor the serum calcium, or refer to an endocrinologist.
  - **If the adjusted serum calcium remains high after discontinuation of the drug,** look for another underlying cause or refer to an endocrinologist or other appropriate specialist.
- **Non-parathyroid endocrine disease:** Refer to an endocrinologist.
- **Immobilisation in Paget's disease:** Refer to a specialist in metabolic bone disease.
- **Sarcoidosis:** Refer to a respiratory specialist (or other specialist depending on disease manifestation).
- **Tuberculosis:** Refer to infectious diseases.
- **If a cause is not clear:** Refer the person to an endocrinologist.

$^\$$EDTA = Purple top tube
HPT = Hyperparathyroidism
PHPT = Primary hyperparathyroidism

$^\Delta$Lithium can induce PHPT or cause reduced renal calcium excretion
[+]If myeloma is suspected, arrange for serum and urine protein electrophoresis and BJPs (Immunology, NGH)