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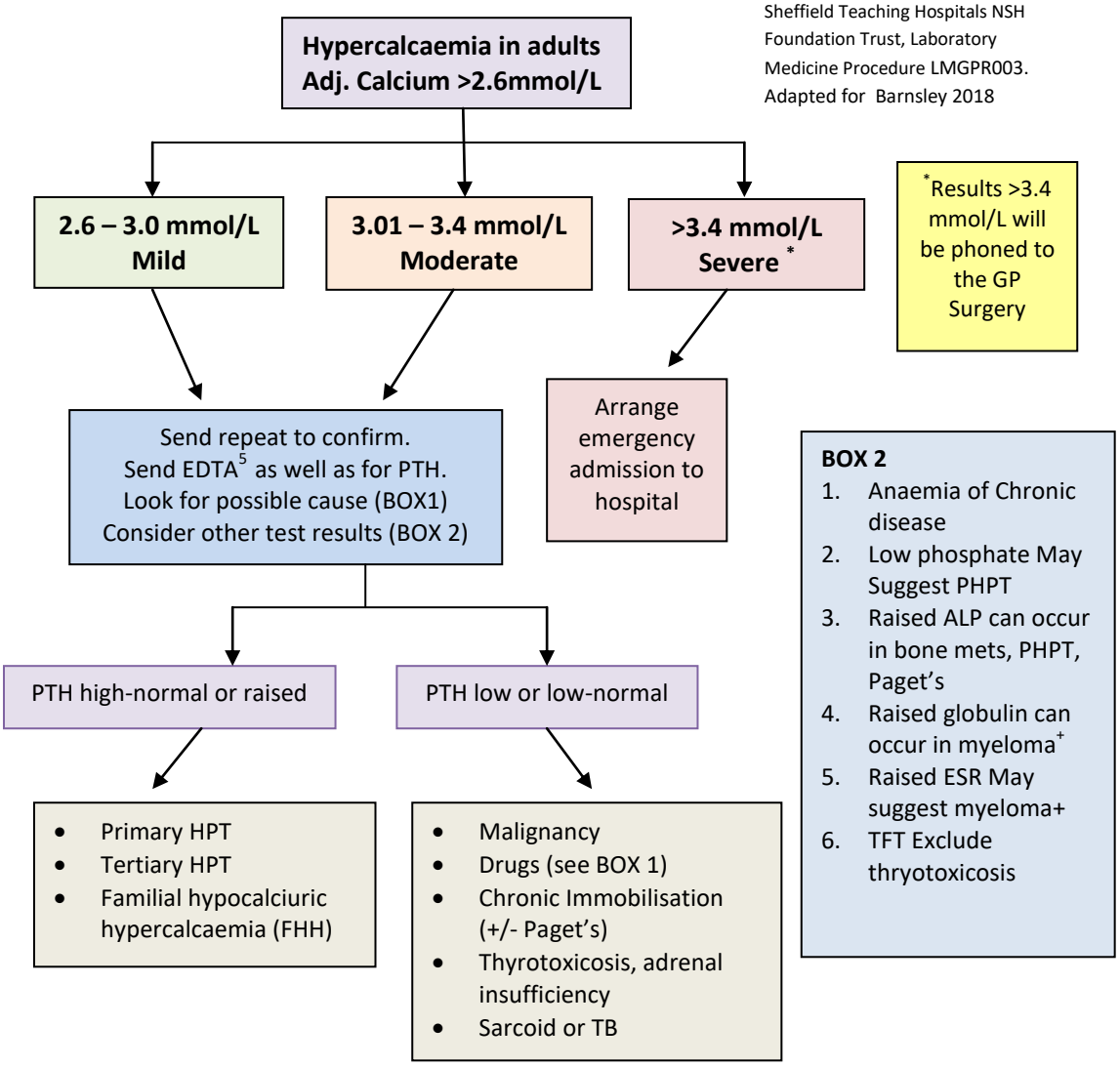
BOX 1
Possible causes:

1. Addison's (v.rare cause)
2. Chromic immobilisation (particularly in Paget's)
3. Dehydration (may be a cause or a symptom)
4. ESRF or transplant: Suggesting tertiary HPT
5. Malignancy; Bone mets (eg breast, prostate, lung ca and myeloma)
6. PHPT: May have history of renal stones or #
7. Sarcoidosis or TB (both rare)
8. Thyrotoxicosis (rare cause)

Drugs: These include

1. Calcium supplements
2. Calcium- containing antacids (or calcium supplements co-prescribed with antacids)
3. Lithium [Δ]
4. Thiazide diuretics
5. Vitamin A toxicity
6. Vitamin D analogues eg alfacalcidol, calcitriol
7. Vitamin D replacement with egro-or calciferol **(rare cause)**



BOX 2

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

MANAGEMENT OF SEVERE OR SYMPTOMATIC HYPERCALCAEMIA (>3.40mmol/L):

Admit immediately to hospital

MANAGEMENT OF ASYMPTOMATIC, MILD OR MODERATE HYPERCALCEMIA (≤3.40mmol/l):

Suggested management by suspected cause:

- **Primary hyperparathyroidism or FHH:** Refer to an endocrinologist
- **Malignancy:** Refer urgently to the appropriate specialist
- **Known CKD STAGE 4/5:** Refer to their renal specialist
- **New renal failure** (?secondary or hypercalcaemia); Consider admitting to hospital or referring them urgently to a renal specialist (depending on the symptoms and likely speed of onset)
- **Drugs:** Stop them if appropriate and recheck the serum calcium
    - **If the person is taking ergo-or cholecalciferol**, check their vitamin 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

Advice for Barnsley patients is available via contacting Biochemistry on 01226 432772 or 01226 435749

[5]EDTA = Purple top tube
HPT = Hyperparathyroidism
PHPT -= Primary Hyperparathyroidism

[Δ] Lithium can induce PHPT or cause reduced renal calcium excretion
[+]If Myeloma is suspected, arrange for serum and urine protein electrophoreses (immunology, NGH)