

| Adj Ca <sup>2+</sup><br>(mmol/L) | Interpretation | Action  |   |
|----------------------------------|----------------|---|---|
| 2.60 – 2.99                      | Mild           | Repeat calcium level in 1 week with a paired EDTA sample for PTH    |   |
| >2.99 – 3.50                     | Moderate       | Asymptomatic  | Repeat calcium level in 1 week with a paired EDTA sample for PTH                                      |
|                                  |                | Symptomatic (mild)/known malignancy                                 | Arrange <b>urgent repeat</b> with a paired EDTA sample for PTH, consider assessment at secondary care |
|                                  |                | Severely symptomatic  | <b>Urgent assessment at secondary care/medical urgent care unit</b>                                   |
| >3.50                            | Severe         | <b>Urgent assessment at secondary care/medical urgent care unit</b> |   |

## Critical results



Critical results will be communicated urgently by laboratory staff. Telephone limits are available at: <https://www.uhnm.nhs.uk/our-services/pathology/departments/biochemistry/>

**Hypercalcaemia (>3.5 mmol/L) can potentiate cardiac arrhythmias and can be a medical emergency.**

Consider hospital admission in cases of severe hypercalcaemia or in patients with severe symptoms, regardless of the calcium concentration.

## Symptoms ‘bones, stones, moans, groans’

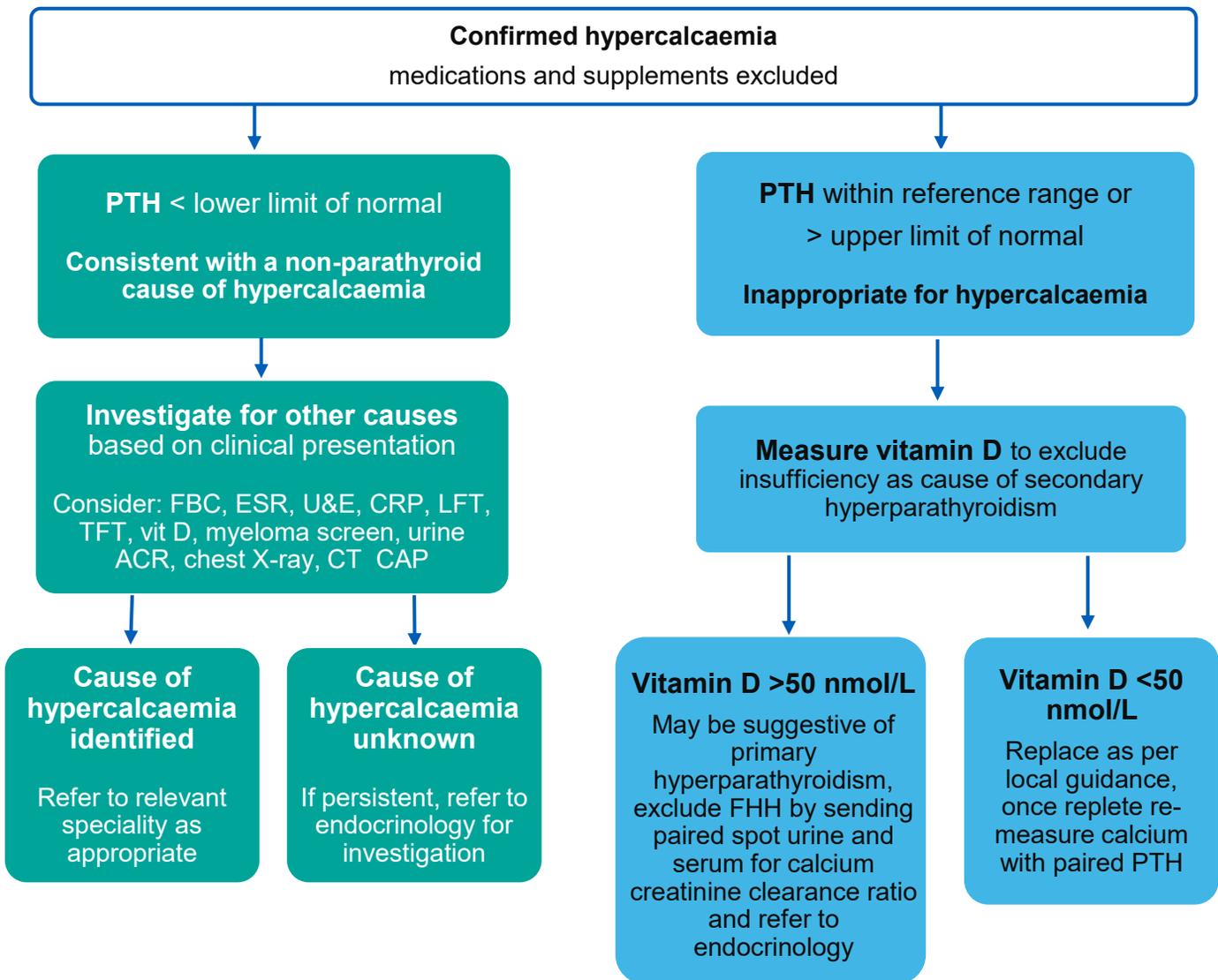
Polyuria, polydipsia, dehydration, nausea, vomiting, constipation, fatigue, muscle weakness, depression, impaired memory concentration and confusion, bone pain, renal stones, drowsiness, insomnia, anxiety, anorexia, hypertension.

Note: mild/moderate hypercalcaemia is often asymptomatic, acute onset is more likely to be symptomatic than chronic.

## Causes

- **Primary hyperparathyroidism**
- **Malignancy** e.g. breast/lung/kidney/prostate cancer or haematological malignancies including multiple myeloma and lymphoma
- **Endocrine disorders** e.g. thyrotoxicosis, adrenal insufficiency/Addisons disease, acromegaly, pheochromocytoma
- **Granulomatous disease** e.g. sarcoidosis, tuberculosis
- **Vitamin D intoxication**
- **Medications** e.g. lithium, thiazide diuretics, calcium supplements, vitamin A intoxication, calcium alkali syndrome
- **Familial hypocalciuric hypercalcaemia**
- **Tertiary hyperparathyroidism** in CKD patients
- **Immobility**

} **90% of cases**



### Further investigations

| Investigation                    | Rationale  |
|----------------------------------|--|
| FBC                              | To diagnose or exclude anaemia of chronic disease or haematologic malignancy   |
| ESR/CRP                          | May be increased in malignancy or other inflammatory or granulomatous conditions   |
| U&E, eGFR                        | To assess hydration status, for AKI and CKD  |
| LFT                              | To exclude liver metastases or chronic liver failure; alkaline phosphatase may be increased in primary hyperparathyroidism, Paget's disease with immobilization, myeloma, or bone metastases |
| Myeloma screen                   | To exclude multiple myeloma  |
| TFT                              | To exclude thyrotoxicosis  |
| Vitamin D                        | If vitamin D toxicity is suspected (rare)  |
| Urine ACR (early morning sample) | If CKD is suspected  |
| Chest x-ray/CT CAP               | To exclude lung cancer or metastases, lymphoma, sarcoidosis, or tuberculosis   |
| 8-9am cortisol*                  | If hypoadrenalism is suspected   |

\* Not routinely required in primary care.