

**OBJECTIVE**

Alberta clinicians optimize laboratory testing for suspected hypercalcemia

**TARGET POPULATION**

Patients with signs or symptoms of hypercalcemia

**EXCLUSIONS**

Children <1 month of age

## RECOMMENDATIONS

- ✓ Measure serum albumin with serum calcium, i.e., for each 10g/L decrease of albumin from 40g/L, correct calcium by adding 0.20 mmol/L
- X Do not apply a tourniquet during the specimen collection for calcium analysis
- ✓ Consider discontinuing thiazides for one month, then repeat serum calcium. Thiazide diuretics can mildly elevate calcium levels
- ✓ Interpret a parathyroid hormone (PTH) level in relation to calcium concentration with mild hypercalcemia
- ✓ Treat hypercalcemia – mild to moderate elevations of calcium with no need for a detailed investigation in patients with known malignancy, i.e., myeloma or carcinoma of bronchus
- ✓ Refer to algortighm (see [Appendix A](#)) for diagnostic options

### PRACTICE POINT

*Symptoms of hypercalcemia include polyuria, altered mentation, nausea/vomiting and constipation*

## BACKGROUND

The estimated incidence of hypercalcemia due to primary hyperparathyroidism and to malignancy are 250 cases per million and 150 cases per million respectively. Overall, the incidence of hypercalcemia is about 0.6%.<sup>1-5</sup> In the outpatient-ambulatory setting, hypercalcemia is usually mild and asymptomatic.

Primary hyperparathyroidism is the probable cause i.e. over 90%, in asymptomatic people over age 50 with long-standing mild hypercalcemia.<sup>1,2,6</sup> In contrast, a high proportion of hospitalized patients with hypercalcemia will have an underlying malignancy. Symptoms of hypercalcemia (i.e., polyuria, altered mentation, nausea/vomiting and constipation) tend to be proportional to how rapidly serum calcium rises, as well as to the absolute level of serum calcium.

The life threatening complications of hypercalcemia are primarily arrhythmia and profound volume depletion due to polyuria. Chronic mild hyperparathyroidism increases the risk of renal calculi, nephrocalcinosis and osteopenia.<sup>7</sup>

## REFERENCES

1. Dent DM, Miller LJ, Klaff L, et al. The incidence and causes of hypercalcemia. *Postgrad Med J.* 1987;63:745-50.
2. Pakmer M, Jakobsson S, Akerstrom G, et al. Prevalence of hypercalcemia in a health survey: a 14 year follow-up on serum calcium values. *Eur J Clin Invest.* 1989;18:39-46.
3. Harvey H. Disorders of the thyroid and parathyroid I. *The Otolaryngol Clin N Am.* 1990;23:175-231,291-303,339- 57.
4. Marcus R. Hypercalcemia. *Endocrinol Metab Clin N Am.* 1989;647-58.
5. National Cancer Institute. Hypercalcemia. 1996.
6. Heath H III, Hodgson SF, Kennedy MA. Primary hyperparathyroidism: changes in the pattern of clinical presentation. *Lancet.* 1980.1:1317-20.
7. Auerbach CD, Marx SJ, Spiegel AM. Parathyroid hormone, calcium and the calciferols. In: Wilson JD, Foster DW (eds). *Williams Textbook of endocrinology*, WB Saunders. 1992;1449.

### ***SUGGESTED CITATION***

Toward Optimized Practice (TOP) Endocrine Working Group. 2008 January. Laboratory endocrine testing: hypercalcemia: clinical practice guideline. Edmonton, AB: Toward Optimized Practice.

For more information see [www.topalbertadoctors.org](http://www.topalbertadoctors.org)

### ***GUIDELINE COMMITTEE***

The committee consisted of representatives of family medicine, general medicine, medical biochemistry, pathology, internal medicine, endocrinology, laboratory technologists and the public.

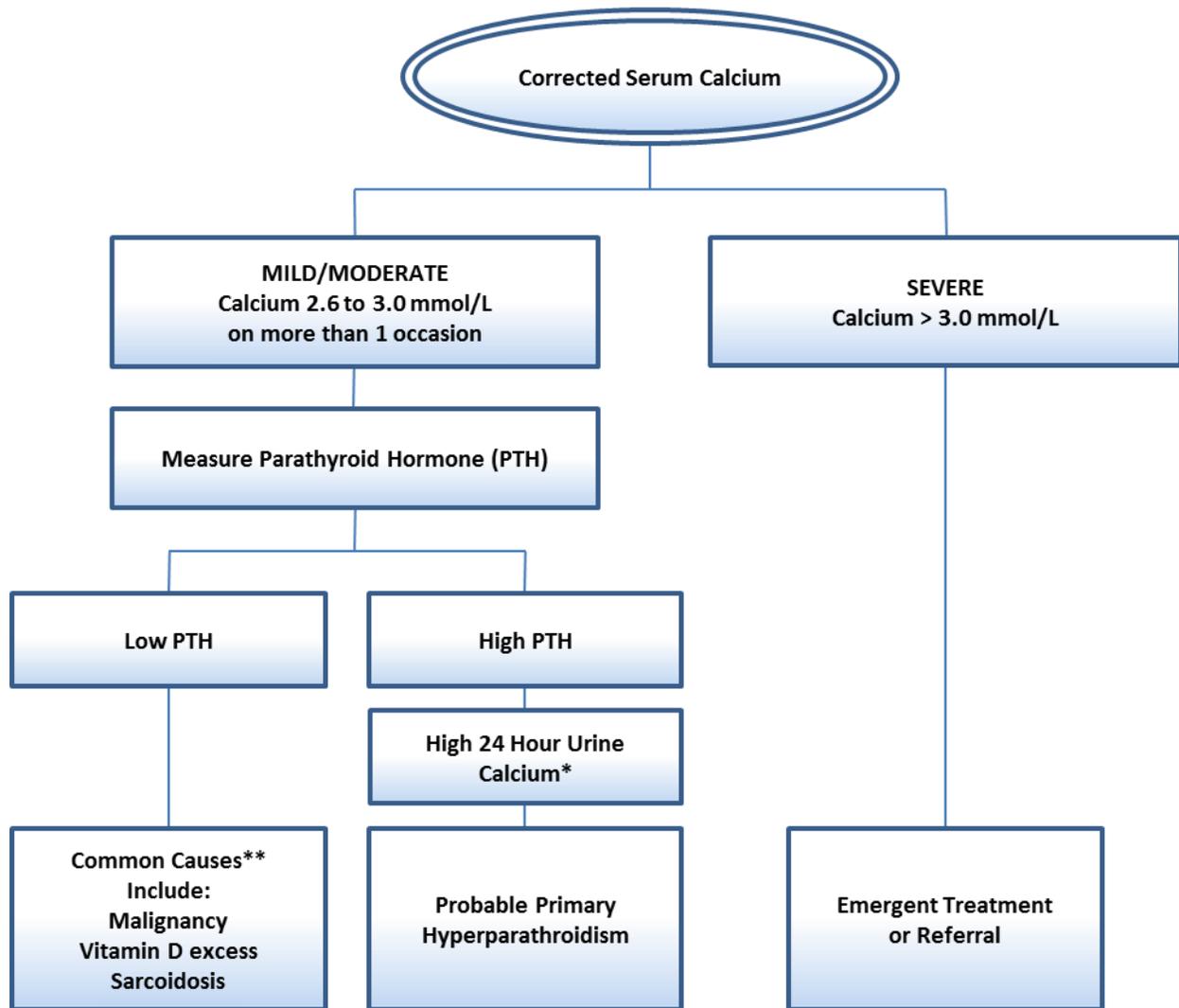
April 1998

Reviewed January 2008

Reviewed May 2014

## APPENDIX A

# Algorithm for Investigation of Hypercalcemia



**Note:** The urgency of addressing an elevated calcium level depends on the degree of elevation of calcium, the rapidity of rise of serum calcium, and the clinical status of the patient.

\* A patient with a low, or low normal, 24 hour urine calcium may have familial hypocalciuric hypercalcemia and referral is warranted. These patients do not require parathyroid surgery.

\* Other causes include: granulomatous disease, milk alkali syndrome, Thiazide diurectics, hyperthyroidism, lithium, immobilization familial hypocalciuric hypercalcemia.