

# Biolab Medical Unit

9 Weymouth Street, London W1W 6DB, UK Tel: (+44) 020-7636-5959/5905 Fax: (+44) 020-7580-3910  
E-mail: [info@biolab.co.uk](mailto:info@biolab.co.uk) Internet: [www.biolab.co.uk](http://www.biolab.co.uk)

Biolab Reference: XXXX/XXXX/G19

Patient: **Sample Report**

Date: **17-09-2019**

DOB: **01-09-1984**

Clinician: **Sample Report**

## **OSTEOPOROSIS PROFILE URINE ELEMENTS**

(Reported as the molar ratio to creatinine to compensate for variations in urine dilution)

**Urine creatinine = 7.34 mmol/L Early morning, second void, random urine (e.m.u.)**

Element	Result	Reference range
Calcium(Ca)	<b>0.95</b>	0.25 – 0.60 mol Ca /mol creatinine
Magnesium (Mg)	<b>0.81</b>	0.50 – 0.85 mol Mg /mol creatinine
Phosphorus (P)	<b>4.49</b>	1.46 – 4.75 mol PO <sub>4</sub> /mol creatinine
Zinc (Zn)	<b>856</b>	17 - 1624 umol Zn/mol creatinine

Although a 24-hour collection is more representative of excretion levels, measurements on early morning, second void urine samples can also be used, with the result normalised and expressed as the molar ratio to creatinine. The above reference ranges are for adults, not children, whose high urine output of calcium and phosphorus reflects normal bone growth.

Urine calcium can be used in the assessment of vitamin D status; if the serum vitamin 25-hydroxy cholecalciferol is > 200 nmol/L and the UCa/Cr is > 0.60, that is evidence for vitamin D toxicity. An increase in osteoclastic bone resorption will also raise the UCa/Cr. Vitamin D deficiency, or a calcium-restricted diet, may reduce the UCa/Cr ratio to < 0.25. Low sodium diets tend to decrease UCa/Cr, while a high sodium intake and excretion increases UCa/Cr.

Urine phosphate is more influenced by diet than is urine calcium because of the greater proportion of dietary PO<sub>4</sub> absorbed from the gut. High circulating vitamin D and PTH cause phosphaturia by increasing the renal clearance of phosphate.

Phosphaturia also causes loss of magnesium in the urine. A low Mg value in an e.m.u. suggests magnesium deficiency, but a normal result does not exclude magnesium deficiency, which can be checked by measuring red cell magnesium.

The wide reference interval for urine zinc reflects the poor intake of zinc in many subjects. Zinc is required for both osteoblastic and osteoclastic activity.

### References:

1. Endres DB, Rude RK. Mineral and bone metabolism. In: Burtis CA, Ashwood ER, Bruns DE. Tietz Textbook of Clinical Chemistry and Molecular Diagnostics 4<sup>th</sup> Ed. Elsevier-Saunders pubs, St. Louis Mis, 2006, pp 1891-1965.
2. Giannini S, Nobile M, Dalla Carbonare L, et al. Hypercalciuria is a common and important finding in postmenopausal women with osteoporosis. *Eur J Endocrinol.* 2003;149:209–213.
3. Nguyen TV, Eisman JA, Kelly PJ, et al. Risk factors for osteoporotic fractures in elderly men. *Am J Epidemiol.* 1996;144:255–263.
4. Ghazali S, Barratt TM. Urinary excretion of calcium and magnesium in children. *Arch Dis Child.* 1974;49:97–101.