



Memo No. 2022-003
Date: 28-Feb-2022
Memo To: Clients
Re: *Test Revisions – Random Urine Trace Metals at LHSC*

New creatinine-adjusted reference ranges for trace elements in random urine will be implemented effective March 1, 2022, for tests performed at the PaLM Trace Elements Laboratory at London Health Sciences Centre. (Please note that these revisions are not applicable to trace element analysis offered by the Hamilton Regional Laboratory Medicine Program).

New Reference Ranges

The new reference ranges were developed based on 124 healthy individuals (3-79 years, both female and male). Urinary trace elements were analyzed with high resolution ICP-MS and creatinine measured by an enzymatic method. Increasing the number of reference individuals and measuring trace elements and creatinine in parallel have improved the reliability and accuracy of the reference range.

Age and gender related reference ranges will no longer be reported as the reference population was heterogenous in nature and because the sample sizes required for partitioning by age and sex were not large enough for statistical analysis.

Urinary concentrations of trace elements will be reported as element/creatinine ratio. Reporting unit per litre, e.g., $\mu\text{mol/L}$ and $\mu\text{g/L}$ will no longer be reported because urinary concentrations of trace elements are largely influenced by variations in urine dilution.

Interfaces and ICL Test Catalogue

These revisions will be reflected in the ICL online catalogue effective March 1, 2022.

The Result Codes for reporting unit per litre, e.g., $\mu\text{mol/L}$ and $\mu\text{g/L}$ will no longer be reported. The interface Order Codes will not change. Result Codes for reporting Creatinine results and element/creatinine ratio will not change.

If you have further questions, please contact Client Care at (416) 422-3000 Ext. 300 or info@ICLabs.ca

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**New Reference Ranges for Trace Elements Random Urine At LHSC
(Effective 1 March 2022)**

Element	SI Units		Conventional	
			Units	Unit
Aluminum	<68	µmol/mol Cre	<16	µg/g Cre
Antimony	<108	nmol/mol Cre	<116	ng/g Cre
Arsenic Total	<93	µmol/mol Cre	<62	µg/g Cre
Arsenic Inorganic	<21	µmol/mol Cre	<14	µg/g Cre
Barium	<7.8	µmol/mol Cre	<9.5	µg/g Cre
Beryllium	<2.4	µmol/mol Cre	<191	ng/g Cre
Bismuth	<32	nmol/mol Cre	<59	ng/g Cre
Boron	5 - 51	mmol/mol Cre	0.5 – 4.9	mg/g Cre
Cadmium	<1.4	µmol/mol Cre	<1.4	µg/g Cre
Chromium	0.09 - 1.75	µmol/mol Cre	0.04 - 0.80	µg/g Cre
Cobalt	0.16 - 3.46	µmol/mol Cre	0.08 - 1.80	µg/g Cre
Copper	9 - 79	µmol/mol Cre	5 - 44	µg/g Cre
Iron	5 - 38	µmol/mol Cre	2 - 19	µg/g Cre
Lead	<1.0	µmol/mol Cre	<1.8	µg/g Cre
Manganese	0.05 - 1.42	µmol/mol Cre	0.02 - 0.69	µg/g Cre
Mercury	<1.2	µmol/mol Cre	<2.1	µg/g Cre
Molybdenum	18 - 176	µmol/mol Cre	15 - 149	µg/g Cre
Nickel	<10	µmol/mol Cre	<5.2	µg/g Cre
Selenium	34 - 159	µmol/mol Cre	23 - 111	µg/g Cre
Silver	<49	nmol/mol Cre	<47	ng/g Cre
Strontium	78 - 483	µmol/mol Cre	60 - 374	µg/g Cre
Sulfur	1.4-3.6	mol/mol Cre	397-1021	mg/g Cre
Thallium	<356	nmol/mol Cre	<643	ng/g Cre
Tin	<1.8	µmol/mol Cre	<1.9	µg/g Cre
Uranium	<7.1	nmol/mol Cre	<15	ng/g Cre
Vanadium	21 - 176	nmol/mol Cre	10 - 79	ng/g Cre
Zinc	70- 1285	µmol/mol Cre	40 - 743	µg/g Cre

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