

Memo no.: 2023-017
Date: 3-Jun-2024
Memo to: Clients
Re: Trace Metals Analysis at LHSC

The Trace Elements Laboratory at London Health Sciences Centre (LHSC) is transitioning from High Resolution ICP-MS to a state-of-the-art Triple Quad ICP-MS platform (Agilent 8900) for trace metals analysis.

Note: Specimens received at ICL up to and including Thursday June 6, 2024, will be analyzed using the current technology. Specimens received on or after Friday June 7, 2024, will be analyzed using the new technology and a report comment will be added to indicate the change.

- Linearity, accuracy, and precision have been assessed for all matrices.
- Method comparisons and reference interval validations have been assessed.
- Some reference intervals will be revised and are attached with this memo. The ICL online catalogue will be revised on Monday June 10, 2024.
- Alert and Action Levels are unaffected.
- Specimen requirements and handling instructions are unaffected by this change.
- Interface codes are unaffected.
- Test prices are unaffected.

We apologize for the short notice.

If you have further questions, please contact Client Care at 416-422-3000 ext. 300 or info@iclabs.ca

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Revised Trace Metals Reference Intervals

Method: Triple quadrupole ICP-MS/MS; Platform: Agilent 8900

Testing Laboratory: Trace Elements Lab, London Health Sciences Centre

Erythrocytes, plasma, random urine and whole blood: All reference intervals have been validated for subjects 18 years and older unless displayed with an age stratification. All reference intervals are applicable to both male and female subjects unless displayed with sex stratification.

Reports will include the reference interval applicable by age or sex for the submitted specimen, but the sex or age category will not be indicated with the reference interval.

Urine, 24-hour collection: Reference intervals have been adopted with no change.

ERYTHROCYTES				
Element	Non-SI Reference Interval	Non-SI Units	SI Reference Interval	SI Units
Antimony	<= 0.50	ug/L	<= 4.11	nmol/L
Arsenic	<= 4.9	ug/L	<= 65.4	nmol/L
Calcium	11.21 - 20.43	mg/L	0.28 - 0.51	mmol/L
Cadmium	<= 5.20	ug/L	<= 46.3	nmol/L
Cobalt	<= 0.50	ug/L	<= 8.5	nmol/L
Chromium	<= 1.60	ug/L	<= 30.8	nmol/L
Copper	551 - 862	ug/L	8.7 - 13.6	umol/L
Lead	<= 36.8	ug/L	<= 0.18	umol/L
Mercury	<= 6.25	ug/L	<= 31.2	nmol/L
Magnesium	38.1 - 55.6	mg/L	1.57 - 2.29	mmol/L
Manganese	9.4 - 38.3	ug/L	171 - 697	nmol/L
Molybdenum	<= 1.0	ug/L	<= 10.4	nmol/L
Nickel	<= 2.8	ug/L	<= 47.7	nmol/L
Selenium	150 - 233	ug/L	1.9 - 3.0	umol/L
Thallium	< 0.050	ug/L	< 0.24	nmol/L
Titanium	<= 4.0	ug/L	<= 83.6	nmol/L
Vanadium	< 0.250	ug/L	< 4.9	nmol/L
Zinc	0-13y: 5194 - 15061	ug/L	0-13y: 79 - 230	umol/L
	>= 13y: 9026- 15061	ug/L	>= 13y: 138 - 230	umol/L

PLASMA				
Element	Non-SI Reference Interval	Non-SI Units	SI Reference Interval	SI Units
Aluminum	<= 7.9	ug/L	<= 293	nmol/L
Cobalt	<= 0.65	ug/L	<= 11.0	nmol/L
Chromium	<= 0.50	ug/L	<= 9.6	nmol/L
Copper	0-4m: 89 - 457	ug/L	0-4m: 1.4 - 7.2	umol/L
	4-7m: 248 - 1099	ug/L	4-7m: 3.9 - 17.3	umol/L
	7m-1y: 502 - 1302	ug/L	7m-1y: 7.9 - 20.5	umol/L
	1-6y: 801 - 1499	ug/L	1-6y: 12.6 - 23.6	umol/L
	6-10y: 839 - 1360	ug/L	6-10y: 13.2 - 21.4	umol/L
	10-14y M: 800 - 1207	ug/L	10-14y M: 12.6 - 19.0	umol/L
	10-14y F: 822 - 1201	ug/L	10-14y F: 12.9 - 18.9	umol/L
	> 14y M: 711 - 1310	ug/L	> 14y M: 11.2 - 20.6	umol/L
	> 14y F: 860 - 2317	ug/L	> 14y F: 13.5 - 36.5	umol/L
Manganese	0.44 - 1.14	ug/L	8.0 - 20.8	nmol/L
Molybdenum	0.4 - 2.3	ug/L	4.7 - 24.0	nmol/L
Nickel	<= 1.3	ug/L	<= 22.2	nmol/L
Selenium	0-1y: 56.9 - 95.6	ug/L	0-1y: 0.72 - 1.21	umol/L
	1-6y: 96.4 - 143.8	ug/L	1-6y: 1.22 - 1.82	umol/L
	6-10y: 100.8 - 161.4	ug/L	6-10y: 1.28 - 2.04	umol/L
	> 10y: 105.3 - 160.4	ug/L	> 10y: 1.33 - 2.03	umol/L
Titanium	< 3.00	ug/L	< 62.7	nmol/L
Vanadium	<= 0.250	ug/L	<= 4.9	nmol/L
Zinc	0-1m: 647 - 1399	ug/L	0-1m: 9.9 - 21.4	umol/L
	1m-1y: 647 - 1301	ug/L	1m-1y: 9.9 - 19.9	umol/L
	1-5y: 673 - 1183	ug/L	1-5y: 10.3 - 18.1	umol/L
	5-9y: 771 - 1072	ug/L	5-9y: 11.8 - 16.4	umol/L
	9-13y M: 758 - 1007	ug/L	9-13y M: 11.6 - 15.4	umol/L
	9-13y F: 791 - 1176	ug/L	9-13y F: 12.1 - 18.0	umol/L
	>= 13y: 617 - 979	ug/L	>= 13y: 9.4 - 15.0	umol/L

WHOLE BLOOD				
Element	Non-SI Reference Interval	Non-SI Units	SI Reference Interval	SI Units
Aluminum	<= 15	ug/L	<= 560	nmol/L
Antimony	<= 3.00	ug/L	<= 24.64	nmol/L
Arsenic	<= 3.8	ug/L	<= 50.7	nmol/L
Cadmium	0-17y: <= 0.71	ug/L	0-17y: <= 6.3	nmol/L
	> 17y: <= 3.60	ug/L	> 17y: <= 32.0	nmol/L
	Smokers: <= 5.4	ug/L	Smokers: <= 48.0	nmol/L
Cobalt	<= 0.50	ug/L	<= 8.5	nmol/L
Chromium	<= 1.20	ug/L	<= 23.1	nmol/L
Copper	M: 683 - 1036	ug/L	M: 10.8 - 16.3	umol/L
	F: 752 - 1565	ug/L	F: 11.8 - 24.6	umol/L
Lead	<= 20	ug/L	<= 0.10	umol/L
Mercury	0-17y: <= 1.72	ug/L	0-17y: <= 8.6	nmol/L
	> 17y: <= 3.70	ug/L	> 17y: <= 18.5	nmol/L
Manganese	5.4 - 19.5	ug/L	98 - 355	nmol/L
Molybdenum	<= 1.6	ug/L	<= 16.7	nmol/L
Nickel	<= 1.3	ug/L	<= 22.2	nmol/L
Selenium	117 - 177	ug/L	1.48 - 2.24	umol/L
Thallium	< 0.050	ug/L	< 0.24	nmol/L
Titanium	< 3.0	ug/L	< 62.7	nmol/L
Vanadium	< 0.250	ug/L	< 4.9	nmol/L
Zinc	4083 - 6044	ug/L	63 - 92	umol/L

URINE, RANDOM				
Element	Non-SI Reference Interval	Non-SI Units	SI Reference Interval	SI Units
Aluminum	<= 16	ug/g Cre	<= 67	umol/mol Cre
Antimony	<= 116	ng/g Cre	<= 108	nmol/mol Cre
Arsenic	<= 62	ug/g Cre	<= 93	umol/mol Cre
Boron	<= 4.9	mg/g Cre	<= 51.3	mmol/mol Cre
Barium	<= 9.5	ug/g Cre	<= 7.8	umol/mol Cre
Beryllium	<= 191	ng/g Cre	<= 2.4	umol/mol Cre
Bismuth	<= 59	ng/g Cre	<= 32	nmol/mol Cre
Cadmium	<= 1.4	ug/g Cre	<= 1.4	umol/mol Cre
Cobalt	<= 1.80	ug/g Cre	<= 3.46	umol/mol Cre
Chromium	<= 2.00	ug/g Cre	<= 4.35	umol/mol Cre
Copper	5 - 44	ug/g Cre	9 - 79	umol/mol Cre
Iron	<= 29	ug/g Cre	<= 59	umol/mol Cre
Lead	<= 1.8	ug/g Cre	<= 1.0	umol/mol Cre
Mercury	<= 2.1	ug/g Cre	<= 1.2	umol/mol Cre
Manganese	<= 0.69	ug/g Cre	<= 1.42	umol/mol Cre
Molybdenum	15 - 149	ug/g Cre	18 - 176	umol/mol Cre
Nickel	<= 5.2	ug/g Cre	<= 10	umol/mol Cre
Sulfur	324 - 1011	mg/g Cre	1.1 - 3.6	mol/mol Cre
Selenium	23 - 111	ug/g Cre	33 - 159	umol/mol Cre
Strontium	60 - 374	ug/g Cre	77 - 483	umol/mol Cre
Thallium	<= 643	ng/g Cre	<= 356	nmol/mol Cre
Tin	<= 3.0	ug/g Cre	<= 2.9	umol/mol Cre
Uranium	<= 15	ng/g Cre	<= 7.1	nmol/mol Cre
Vanadium	<= 79	ng/g Cre	<= 176	nmol/mol Cre
Zinc	40 - 743	ug/g Cre	69 - 1286	umol/mol Cre