



MEMORANDUM

DATE: September 16, 2015

TO: All Physicians, Clinical Managers, and Clinical Educators with Hamilton Health Sciences and St. Joseph's Healthcare

FROM: Dr. Tony Chetty, Discipline Director, Clinical Chemistry/Immunology

RE: **Change in Methodology for Trace Metal Menu and Updated Reference Intervals**

Effective September 28, 2015, all trace metal testing currently analyzed by Atomic Absorption (AA) will be performed by inductively coupled plasma mass spectrometry (ICP-MS). ICP-MS is considered state-of-the-art technology with respect to trace metal analysis offering increased sensitivity, precision, as well as a broader test menu relative to AA.

This change in methodology also incorporates an update to the reference intervals (RI) for the trace metal test menu (see accompanying table).

Please note: These changes only apply to Trace Metal analysis performed on the following specimen types:

- Plasma/serum
- Whole Blood
- RBC
- Urine

For further information about these changes, please contact:

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Updated Trace Metal Reference Intervals

Test Name	RI	UNITS
Aluminum - 24U	0.00-0.93	µmol/d
Aluminum - RU	NA	µmol/L
Aluminum - P	0-293	nmol/L
Aluminum - WB	0 - 560	nmol/L
Arsenic - 24U	0- 0.67	µmol/d
Arsenic - RU	0- 0.67	µmol/L
Arsenic - WB	0-26.6	nmol/L
Cadmium - 24U	0-18	nmol/d
Cadmium - RU	0-18	nmol/L
Cadmium - WB	6-19 y: 0-2.14	nmol/L
	>=20y: 0-9.1 0	nmol/L
Cobalt - 24U	0.17-34	nmol/d
Cobalt - RU	0.17-34	nmol/L
Cobalt - P	5.1-17.3	nmol/L
Cobalt - WB	0.68-10.9	nmol/L
Copper - 24U	0.06 - 0.28	µmol/d
Copper - RU	0.04-0.19	µmol/L
Copper - P	0 - 3m: 1.4 - 7.2	µmol/L
	4 - 6m: 3.9 - 17.3	µmol/L
	7 - 12m: 7.9 - 20.5	µmol/L
	1 - 5y: 12.6 - 23.6	µmol/L
	6 - 9y: 13.2 - 21.4	µmol/L
	Male: 10 - 13y: 12.6 - 19.0	µmol/L
	Female: 10 - 13y: 12.9 - 18.9	µmol/L
	Male: >= 14y: 11.2 - 20.6	µmol/L
	Female: >= 14y: 13.5 - 36.5	µmol/L
Copper - WB	Male: 10.8 - 16.3	µmol/L
	Female: 11.8 - 24.6	µmol/L

Updated Trace Metal Reference Intervals

Test Name	RI	UNITS
Antimony - 24U	0.00-4.74	nmol/d
Antimony - RU	0.00-4.74	nmol/L
Antimony -P	0.00-3.16	nmol/L
Barium - 24U	0.0-36.5	nmol/d
Barium - RU	0.0-36.5	nmol/L
Beryllium - 24U	0.0-6.0	nmol/d
Beryllium - RU	0.0-6.0	nmol/L
Bismuth - P	0-0.32	nmol/L
Bismuth - WB	0-72	nmol/L
Boron - 24U	0.065-0.62	mmol/d
Boron - RU	0.065-0.62	mmol/L
Chromium - 24U	3.8 - 15.4	nmol/d
Chromium - RU	1.7-10.0	nmol/L
Chromium - P	2.5 - 6.0	nmol/L
Chromium - S	1.9 - 3.8	nmol/L
Chromium - WB	2.3 - 7.7	nmol/L
Iodine - 24U	0.79 - 3.62	µmol/d
Iodine - RU	0.33-2.76	µmol/L
Iodine - P	0.24 - 0.63	µmol/L
Zinc - 24U	1.5 - 9.2	µmol/d
Zinc - RU	0.9-6.1	µmol/L
Zinc - E	0 - 12y: 79 - 183	µmol/L
	>= 13y: 138 - 230	µmol/L
Zinc-P	0 - 1m: 9.9 - 21.4	µmol/L
	1 - 12m: 9.9 - 19.9	µmol/L
	1 - 4y: 10.3 - 18.1	µmol/L
	5 - 8y: 11.8 - 16.4	µmol/L
	9 - 12y, Male: 11.6 - 15.4	µmol/L
	9 - 12y, Female: 12.1 - 18.0	µmol/L
	>= 13y, M&F: 9.4 - 15.0	µmol/L

Updated Trace Metal Reference Intervals

Test Name	RI	UNITS
Molybdenum - 24U	0.20-1.80	nmol/d
Molybdenum - RU	0.20-1.80	nmol/L
Molybdenum - P	5.2 - 21.9	nmol/L
Molybdenum - WB	4.2 - 16.7	nmol/L
Nickel - 24U	0-102	nmol/d
Nickel - RU	0-102	nmol/L
Nickel - P	0.0 - 17	nmol/L
Strontium - 24U	0.46-2.62	nmol/d
Strontium - RU	0.34-1.82	nmol/L
Thallium - 24U	0-24.5	nmol/d
Thallium - RU	0-24.5	nmol/L
Thallium - WB	0.00 -9.78	nmol/L
Tin - 24U	4.8-77.9	nmol/d
Tin - RU	4.8-77.9	nmol/L
Tin-WB	0-42	nmol/L
Titanium - P	0.0 - 7.9	nmol/L
Titanium - WB	0.0 - 20.9	nmol/L
Uranium -24U	0.000 - 0.042	nmol/d
Uranium - RU	0.000 - 0.042	nmol/L
Vanadium - 24U	<=10.0	nmol/d
Vanadium - RU	<=10.0	nmol/L
Vanadium - WB	<=1.0	nmol/L
Silver -24U	0-27.9	nmol/d
Silver -U	0-27.9	nmol/L
Silver -P	0-1.86	nmol/L
Silver -WB	0.0 - 3.2	nmol/L

Updated Trace Metal Reference Intervals

Abbreviations	
RI	Reference Interval
NA	Not Available
24U	24 hour Urine
RU	Random Urine
WB	Whole Blood
E	Erythrocyte
P	Plasma
S	Serum

Validation information available on request