Genova Diagnostics
Metametrix Clinical Laboratory
3425 Corporate Way • Duluth GA 30096 USA
770.446.5483 • Fax: 770.441.2237
www.gdx.net/www.metametrix.com

Ordering Physician:

John Doe, MD
1234 Main St.
Anywhere, GA 30096

Accession #:	**A1212200075**	Date Collected:	12/19/2012
Reference #:		Date Received:	12/20/2012
Patient:	**Sample Report**		
Date of Birth:	02/05/1962	Date of Report:	01/09/2013
Age:	50	Telephone:	(770) 446-4583
Sex:	Female	Fax:	(770) 441-2237
Reprinted:	01/30/2013		
Comment:			

Elements Nutrient & Toxic Toxic Metals

0152 Toxic Elements - 6-8 Hour Urine

Methodology: Inductively Coupled Plasma/Mass Spectrometry

Chelating Agent:DMSA

Toxic Elements

	Element	Results µg/gm creatinine		Quintile Ranking (1st 20 2nd 40 3rd 60 4th 80 5th)	95% Reference Range
1.	Aluminum	<DL			<= 10
2.	Arsenic	3		37	<= 136
3.	Cadmium	<DL		0.43	<= 0.77
4.	Lead	4.3	H		<= 2.7
5.	Mercury	<DL			<= 3.2
6.	Thallium	0.09		0.24	<= 0.83

Potentially Toxic Elements

	Element	Results µg/gm creatinine		95% Reference Range
7.	Antimony	<DL		<= 0.21
8.	Barium	0.4		<= 11.9
9.	Bismuth	<DL		<= 0.71
10.	Cesium	1.4		<= 11.9
11.	Indium	<DL		<= 0.028
12.	Niobium	<DL		<= 0.055
13.	Palladium	<DL		<= 0.32
14.	Platinum	<DL		<= 1.0
15.	Rubidium*	0.27		<= 3.18
16.	Thorium	<DL		<= 0.02
17.	Tin	0.2		<= 6.3

0152 Toxic Elements - 6-8 Hour Urine

Methodology: Inductively Coupled Plasma/Mass Spectrometry

Chelating Agent:DMSA

	Element	Results µg/gm creatinine	Flag	Quintile Ranking chart labels	95% Reference Range
Potentially Toxic Elements					
18.	Tungsten	<DL			<= 0.55
19.	Uranium	<DL			<= 0.027
20.	Zirconium	<DL			<= 0.50
Elements of Uncertain Human Requirement					
21.	Boron*	0.44		0.20 / 3.10	0.05-5.40
22.	Lithium	15		8 / 56	6-157
23.	Nickel	0.8	L	0.9 / 4.2	0.4-7.2
24.	Strontium	36	L	58 / 284	19-433
25.	Vanadium	<DL		0.18	<= 0.61

Quintile Ranking: 1st (0–20), 2nd (20–40), 3rd (40–60), 4th (60–80), 5th (80–100)

Creatinine = 198 mg/dL

<DL = less than detection limit

*Boron and rubidium are reported in µg/mg creatinine.

Finding a measurable amount of potentially toxic elements in the urine does not mean that the level of these elements found causes an adverse health effect.

Reference Range Information:
Elemental reference ranges were developed from a healthy population under non-provoked/non-challenged conditions. Provocation with challenge substances is expected to raise the urine level of some elements to varying degrees, often into the cautionary or TMPL range. The degree of elevation is dependent upon the element level present in the individual and the binding affinities of the challenge substance.

0152 Toxic Elements - 6-8 Hour Urine

Methodology: Inductively Coupled Plasma/Mass Spectrometry

Chelating Agent:DMSA

Commentary

Commentary is provided to the practitioner for educational purposes, and should not be interpreted as diagnostic or treatment recommendations. Diagnosis and treatment decisions are the responsibility of the practitioner.

Lead, Pb, Lead is above the reference range. 75% to 80% of absorbed lead is typically excreted via urine, 15 to 20% via bile, and the remainder via sweat, hair and nails. In non-provoked urine, lead levels can fluctuate according to variable dietary and physiological factors, and the level does not necessarily reflect body burden. Provoked levels, however, can be indicative of excess lead in body tissues. It is notable that for children (compared with adults), lead can be more toxic, with detrimental effects occurring at much lower levels. Furthermore, toxicity of lead can be significantly increased synergistically by the presence of either mercury or cadmium.

Most lead uptake occurs via ingestion of contaminated food or water. Inhalation of lead dusts and transdermal absorption of organic lead salts are other modes of uptake. While temporarily carried in the bloodstream, lead is at least 90% bound to erythrocytes, however, with chronic low-level or long-ago exposure, only 2% or less of total body lead remains in the blood. Lead primarily deposits and accumulates in the aorta, liver, kidneys, adrenal and thyroid glands, bones and teeth. This element interferes with membrane functions, bonds to sulfhydryl (-SH), phosphate, hydroxyl and amino sites on proteins and enzyme cofactors, and interferes with heme synthesis, iron transport, erythrocyte life span, and hepatic cytochrome P-450 functions. Other deleterious effects include: reduced vitamin D synthesis, slowed nerve conduction, peripheral neuropathy, hypertension (adults) and loss of IQ and developmental disorders (children). Anemia, neuropathies and encephalopathy are end-stage conditions of severe lead excess.

Although historic uses of lead (housepaint, anti-knock gasoline additives, and soldered joints in water systems) have been discontinued, old building materials, paint chips, plumbing and the environment may contain residual amounts from these sources. Other sources include batteries in cars, trucks, boats, and power backup systems, art supplies, colored glass kits, bullets, fishing sinkers, balance weights, radiation shields, bearing alloys, babbitt metal, some ceramic glazes or pigments, and sewage sludge. Some cities that have not replaced old water mains may have variable amounts of lead in the drinking water.

Nickel, Ni, was found to be below the reference range. Nickel is considered an element of uncertain human requirement. Nickel has been shown to work in a cooperative way with calcium, iron, and zinc. Urine and plasma have been used for assessing nickel exposure, although only acute exposure is revealed because nickel is rapidly cleared from blood.

Strontium, Sr, is below the reference range. Urinary strontium level has been correlated with tissue levels. Strontium usually tracks the calcium level as well. Natural strontium is a mixture of stable (not radioactive) isotopes.The strontium measured is natural, stable strontium 88, associated with calcium in animal and vegetable tissues, in soils and in the earth's crust.

Low strontium may be observed in calcium deficiency, malabsorption syndromes, vitamin D deficiency, low or deficient protein diets where calcium retention is poor, urinary calcium wasting diseases, excessive tooth decay, some bone diseases and aplastic anemia.