sample type: **URINE**

Toxic Element Clearance Profile

This **Toxic Element Clearance Profile** measures urinary excretion of a diverse range of potentially harmful elements, both well known toxics such as lead and mercury, as well as new technology toxics such as niobium.

The **Toxic Element Clearance Profile** offers an advanced, comprehensive assessment of toxic and potentially toxic elements excreted in the urine. In addition to measuring classic elemental toxics, this profile includes elements used in medical, aerospace, nuclear and high-tech electronics industries. Use of these potential toxins is increasing because of their growing commercial, industrial, and medical applications.

Sources of Exposure:

Accumulations of these toxics can occur in the human body in response to occupational exposures or to environmental exposures from toxic release in air, soil, or industrial waste streams. These include:

- Metal refining
- Alloying
- Plating and parts manufacture in aerospace and machine tool industries
- Fabrication of nuclear reactor fuel assemblies
- Electronics and computer manufacturing

According to the EPA, the U.S. has the largest electronics (including computer) workforce in the world. Exposures to the measured elements can occur in other occupations as well, including:

- Welding and metal shaping
- Plumbing
- Oil refining
- Manufacture of pigments and coatings
- Military or police service (with weapons use)
- Handling and disposal of wastes
- Petrochemical production

Health Consequences of Exposure:

Evidence suggests that chronic toxic element exposure can adversely affect:

- Energy levels
- Reproductive function
- Cancer risk
- Degenerative conditions
- Neurological development and function
- Respiratory, cardiac, hepatic and immune functions
- Cognitive and emotional health

Researchers are discovering detrimental health effects of toxic heavy metals at lower and lower exposure levels. This raises the issue of whether any toxic element level in the body is safe.

Toxic Element Testing:

The **Toxic Element Clearance Profile** assesses urinary excretion of elements acquired through either chronic or acute exposure. The test enables practitioners to effectively monitor the progress of detoxification regimens and nutrient element status during treatment. All toxic metals are reported as micrograms/g creatinine or as micrograms per 24 hours (if a 24-hour urine specimen is provided).

"Provocative" Urine Testing:

Urine can be collected following the administration of a "challenge" agent (such as EDTA, DMSA, DMPS, and D-penicillamine) targeting specific toxic elements. Depending on the agent administered, urine collection may be spot or short-term (2-6 hours), intermediate (8-12 hours) or a complete 24-hour collection. Since many detoxification agents are element-specific, this approach is best utilized when the clinician suspects specific heavy metal toxicities.

•Analytes:

- **Toxic Elements** *(ratioed to creatinine):*

aluminum	mercury
antimony	nickel
arsenic	niobium
barium	platinum
bismuth	rubidium
cadmium	thallium
cesium	thorium
gadolinium	tin
gallium	tungsten
lead	uranium

- **Nutritional Element**: sulfur

•Specimen requirements:

2 tubes of urine

•Before Patient Takes this Test:

- Avoid taking creatine supplements (2 days before test)
- Check with your healthcare provider about what medications and supplements to avoid (2 days before test)
- Do not collect urine during a menstrual period
- See instructions inside test kit for details

Genova Diagnostics®

Improving Healthcare for Chronic Disease

Toxic Element Clearance Profile
in µg/g Creatinine

Genova Diagnostics®
Improving Healthcare for Chronic Disease

63 Zillicoa Street
Asheville, NC 28801

Patient: **SAMPLE PATIENT**
Age: 40
Sex: M
MRN:

Order Number:
Completed: September 09, 2005
Received: July 20, 2005
Collected: July 20, 2005

Toxic Elements

Results in µg/g creatinine

Element	Reference Range	TMPL	Reference Range
Lead	0.4		<= 1.4
Mercury	0.86		<= 2.19
Aluminum	1.2		<= 22.3
Antimony	0.012		<= 0.149
Arsenic	0		<= 50
Barium	0.1		<= 6.7
Bismuth	0.19		<= 0.76
Cadmium	0.05		<= 0.64
Cesium	0.0		<= 10.5
Gadolinium		0.821	<= 0.019
Gallium		0.413	<= 0.028
Nickel	0.45		<= 3.88
Niobium	0.082		<= 0.084
Platinum		0.078	<= 0.033
Rubidium	0		<= 2,263
Thallium	0.133		<= 0.298
Thorium	0.083		<= 0.124
Tin	0.78		<= 2.04
Tungsten	0.094		<= 0.211
Uranium		0.046	<= 0.026

Sulfur

Results in mg/g creatinine

Element	Reference Range	Reference Range
Sulfur*	597	367-1,328

* Elevated sulfur may indicate the presence of a chelating agent.

Creatinine Concentration

Urine Creatinine♦ 136.00 38.00-200.00 mg/dL

Collection Information

Urine Total Volume (in milliliters): 1,200

Length of Collection: (in hours) 24.0

Provocation Comment:
Information regarding provocation was not provided.

TMPL

Tentative Maximum Permissible Limit (TMPL) - Element excretion is significantly elevated, consistent with increased body burden. Increased element concentrations can have a negative impact on overall health and well-being. These values are derived from Casaret and Doull's **Toxicology: The Basic Science of Poisons** , 5th Ed. 1996 McGraw Hill NY, NY p 997-998. Units have been standardized.

The performance characteristics of all assays have been verified by Genova Diagnostics, Inc. Unless otherwise noted with ♦ as cleared by the U.S. Food and Drug Administration, assays are For Research Use Only.

This test reveals important clinical information about:

- ***Urinary excretion of a diverse spectrum of toxic elements and elements,*** *which are toxic at excessive levels, for a total of 20 potentially toxic elements*
- ***The need for and progress*** *of detoxification therapies*
- ***Levels of toxic elements ratioed to creatinine,*** *which provides enhanced accuracy and more flexibility in specimen collection (spot, short-term, intermediate, or 24-hour)*

For test kits, clinical support, or more information contact:

Client Services
Genova Diagnostics
63 Zillicoa St.
Asheville, NC 28801-1074
800-522-4762 • Fax: 828-252-9303

More detailed publications with references are also available: www.GDX.net