Heavy Metals
Key Clinical Messages

What is the Heavy Metals Test?

Vibrant's Heavy Metals test is a blood and/or urine test that measures levels of 20 heavy metals present in the blood or excreted in the urine, respectively.

Why Order Heavy Metals?

Heavy metal toxicity is under-represented as a root cause of illness and disease in humans. It is thought to affect over 1 million individuals annually and can affect virtually all biological systems in the human body. Heavy metals may be the root cause of common neurological disorders, gastrointestinal disorders, autoimmune diseases, and disorders associated with increased oxidative stress, and cellular dysfunction.

What Markers Are Included?

Vibrant's Heavy Metals test includes 20 heavy metals:

- Aluminum
- Antimony
- Arsenic
- Barium
- Beryllium
- Bismuth
- Cadmium

- Cesium
- Gadolinium
- Lead
- Mercury
- Nickel
- Palladium
- Platinum

- Tellurium
- Thallium
- Thorium
- Tin
- Tungsten
- Uranium

Which Patients Benefit From This Test?

Conditions, signs, and risks associated with heavy metal toxicity:

- **Neurological symptoms:** cognitive decline, memory loss, ataxia, tremors, numbness, tingling, neuropathy, myopathy, Alzheimer's disease, multiple sclerosis, paralysis, Parkinson's disease, tinnitus, irritability
- **Respiratory symptoms:** lung disease, lung cancer, breathing problems, respiratory distress, pneumonia
- **Cardiovascular and hematological symptoms:** anemia, RBC abnormalities, hypertension, low blood pressure, hypokalemia, edema, cancers of the blood
- **Gastrointestinal symptoms:** nausea, vomiting, diarrhea, abdominal pain, reduced absorption of nutrients (particularly minerals), dry mouth, metallic taste, pancreatic cancer
- **Skeletal and bone-related symptoms:** osteoporosis, reduced bone mineral density
- **Dermatological symptoms:** dermatitis, eczema, dry skin, sweating, skin lesions, hyperpigmentation, hair loss, allergic skin reactions
- **Renal and hepatic symptoms:** renal failure, elevated liver enzymes, hepatic damage, hepatic failure, suppressed hepatic detoxification, elevated hepatic enzymes
- **Reproductive symptoms:** infertility, difficulty conceiving, birth defects, miscarriage

Methodology

The Heavy Metals test uses inductively coupled plasma mass spectrometry (ICP-MS). The mass spectrum of the sample determines the concentration of each analyte measured. For urine, the analyte results are expressed by normalizing to the quantity of creatinine measured to account for urine dilution variations.

Why Vibrant?

Lab Methodology

Vibrant uses the NexION mass spec instrument which can detect compounds at the parts per quadrillion level.

Vibrant is a CLIA certified and CAP accredited lab.

What Tests Pair Well With Heavy Metals?

- **Micronutrients** – to assess both intracellular and extracellular levels of commonly affected nutrients as many heavy metals deplete critical nutrients such as antioxidants and minerals.
- **Environmental Toxins** – to investigate total toxic burden.
- **Mycotoxin** – to investigate total toxic burden.
- **Gut Zoomer** – to investigate microbial overgrowth burden, intestinal hyperpermeability and/or elevated beta-glucuronidase impacting detoxification and elimination.
- **Hepatic Function Panel** – to investigate liver function impact on detoxification and elimination.
- **Renal Function Panel** – to investigate kidney function impact on detoxification and elimination.
- **Neural Zoomer Plus** – to investigate neurologic autoimmune disorders, as heavy metals can be trafficked into the brain, causing neurotoxicity.
- **Hormones (Serum, Saliva, Urine)** – to investigate heavy metal toxicity impact on hormones and reproductive symptoms.
- **Anemia and Complete Blood Count** – to investigate anemia and red blood cell abnormalities, as heavy metal exposure can cause a variety of hematological disorders.

Test Preparation

- **Fasting:** Not required.

- **Collection:**
    - Urine: One (1) urine specimen tube collected from the first morning urine.
    - Blood: One (1) EDTA tube.

- **Hydration:** Do not drink more than 8 oz water 1 hour prior to each urine collection. Samples may be rejected if the urine is too dilute.

- **Diet:** Avoid foods high in iodine (seafood, dairy, kelp) and selenium (Brazil nuts) 48 hours before collection. Iodine and selenium have strong binding affinity for heavy metals (they act like "heavy metal magnets"). Therefore, consuming these foods prior to the Heavy Metals test may cause falsely lowered results.

Reference Ranges

Vibrant uses two different reference ranges for the Heavy Metals test, based on available NHANES data or internally validated reference ranges for each analyte. NHANES is a nationally representative data set of American's exposure to heavy metals and environmental toxins. For analytes without NHANES population data, reference ranges were established based on Vibrant's internal validation study of a sample population of healthy adults. The results are reported as GREEN: 0-75th percentile, YELLOW: 75th-95th percentile, and RED: >95th percentile. Additional test methodology or reference range information may be found in the Heavy Metals Validation Report, Certificate of Quality Report, and the Vibrant Wellness Help Desk FAQ section.

Provocation

The Heavy Metals test references ranges were validated in unprovoked populations, for both the NHANES population as well as the internally validated sample population. Provoked levels cannot be inferred from unprovoked levels (i.e., "How different would the results be if I used provocation?"), and likewise, unprovoked levels cannot be inferred from provoked levels (i.e., "How different would the results be if I had not used provocation?").

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