



Total Tox Burden

Key Clinical Messages

What is the Total Tox Burden?

The Total Tox Burden is a urine test that assesses the total toxic burden in the body by measuring mycotoxin, heavy metal, and environmental chemical excretion in the urine. This bundle includes three different tests to assess the overall impact of toxic exposure, measuring 29 different mycotoxins, 20 heavy metals, and 38 environmental chemicals. This test can help identify whether an individual is dealing with a toxic burden that may be impacting their health.

Which Tests Pair Well With the Total Tox Burden?

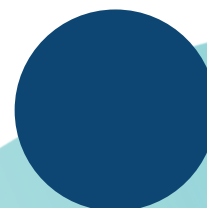
- **PFAS Chemical Test:** The PFAS Chemicals Panel is a urine-based test that measures levels of 21 per- and polyfluoroalkyl (PFAS) substances that have been used in industry and commercial products since the 1940s, and which can be hazardous to human health. *The PFAS Chemical Panel can be added on to the Total Tox Burden test at an additional charge.*
- **Micronutrient or NutriPro:** To assess for micronutrient levels and/or genetic variants in micronutrient absorption, metabolism, transport, or uptake, that are essential to support detoxification processes in the body.
- **Gut Zoomer:** To assess the health of the microbiome and identify how gastrointestinal function, intestinal inflammation, intestinal permeability, bile acid metabolism, and absorption may be impacting total toxic burden.

Why Order the Total Tox Burden?

The Total Tox Burden is a simple and efficient way to gain comprehensive insights into the levels of heavy metals, mold toxins, and environmental toxins in the body. By understanding an individual's toxic burden through this test, practitioners can take the first step toward developing a personalized detoxification and wellness plan.

Exposure to toxins can increase the risk of developmental harm, reproductive harm, cancer, liver damage, hormone imbalances, neurological dysfunction, gastrointestinal issues, and more. Toxins also have the potential to bioaccumulate in the body, meaning they can build up and persist for extended periods, breaking down slowly or not at all. This accumulation can disrupt detoxification, compromise immunity, and increase oxidative stress, making individuals susceptible to further toxic build-ups and negative health effects.

In our daily lives, we face constant exposure to toxins that can impact our health and well-being. Identifying elevated toxins in an individual can help remove sources of exposure and support detoxification specific to those toxins. Due to the ubiquitous nature of toxins, it's important to test—not guess regarding the total toxic burden of our patients.





Lab Methodology

The Mycotoxins and Environmental Chemicals test uses liquid chromatography and mass spectrometry (LC-MS/MS). 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. The analyte results are expressed by normalizing to the quantity of creatinine measured to account for urine dilution variations.

We're proud to be a CLIA-certified and CAP-accredited lab.

Test Prep for Urine Collection

Collection: One (1) urine tube

Hydration Restrictions: Do not drink more than 8 oz water 1 hour before each urine collection. Samples may be rejected in the urine is too dilute.

Fasting: Not required. However, it is important to note that fasting for 12–24 hours may increase the excretion of mycotoxins and environmental toxins from the adipose tissue.

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

Medication Restrictions: None.

Provocation

The test reference ranges were validated in unprovoked populations. Provoked levels cannot be inferred from unprovoked levels (*i.e.*, "How different would the results be if I used provocation?"). Likewise, unprovoked levels cannot be inferred from provoked levels (*i.e.*, "How different would the results be if I had not used provocation?").

Which Patients Benefit From This Test?

Conditions and symptoms which may benefit from Total Tox Burden include:

- **Neurological symptoms:** Alzheimer's disease, Multiple sclerosis, Parkinson's disease, cognitive decline, memory loss, ataxia, tremors, numbness, tingling, neuropathy, paralysis, tinnitus, irritability, mood swings, balance loss or dizziness, disorientation, depression, anxiety, headache, light sensitivity, difficulty finding words, difficulty concentrating
- **Respiratory symptoms:** Lung disease, lung cancer, breathing problems, respiratory distress, pneumonia, coughing, wheezing, shortness of breath
- **Cardiovascular symptoms:** Hypertension, low blood pressure, low blood pressure
- **Hematological symptoms:** Anemia, red blood cell count (RBC) abnormalities, hypokalemia, edema, cancers of the blood
- **Gastrointestinal symptoms:** Nausea, vomiting, diarrhea, abdominal pain, reduced absorption of nutrients (particularly minerals), metallic taste, pancreatic cancer
- **Skeletal and bone-related symptoms:** Osteoporosis, reduced bone mineral density
- **Dermatological symptoms:** Dermatitis, eczema, dry skin, skin rashes
- **Renal and hepatic symptoms:** Renal failure, elevated liver enzymes, hepatic damage, suppressed hepatic detoxification
- **Reproductive symptoms:** Infertility, difficulty conceiving, birth defects, miscarriage
- **Other symptoms:** Fatigue and weakness, chronic burning in the throat and nasal passages, eye irritation or tearing, heightened sensitivity to chemicals, metallic taste in the mouth, morning stiffness or joint pain, muscle weakness, sleep problems, vision or hearing changes, increased urinary frequency or thirst, static shocks, hair loss

Reference Ranges

Mycotoxins

Reference ranges are established based on urine samples from 1000 apparently healthy individuals. Results in **GREEN** correspond to the 0-75th percentile, results in **YELLOW** correspond to the 75th-95th percentile, and results in **RED** correspond to those greater than the 95th percentile of the reference range.

Heavy Metals & Environmental Toxins

Vibrant uses two different reference ranges for the Heavy Metals and Environmental Toxins tests, 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. Reference ranges uses NHANES are indicated with a caret ^.

For analytes without NHANES population data, reference ranges are 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.



Which Markers Are Included in the Total Tox Burden?

The Total Tox Burden bundle includes three tests: Mycotoxins, Heavy Metals, and Environmental Toxins. There are 29 mycotoxins, 20 heavy metals, and 38 environmental chemicals tested.

Urine Creatinine			
Heavy Metals	<ul style="list-style-type: none"> Aluminum Antimony Arsenic Barium Beryllium Bismuth Cadmium 	<ul style="list-style-type: none"> Cesium Gadolinium Lead Mercury Nickel Palladium Platinum 	<ul style="list-style-type: none"> Tellurium Thallium Thorium Tin Tungsten Uranium
Mycotoxins	<ul style="list-style-type: none"> Aflatoxin M1 Aflatoxin B1 Aflatoxin B2 Aflatoxin G1 Aflatoxin G2 Sterigmatocystin Zearalenone Fumosinins B1 Fumosinins B2 Fumosinins B3 	<ul style="list-style-type: none"> Citrinin Mycophenolic Acid Roridin E Enniatin B1 Verracurin A Verracurin J Deoxynivalenol (Vomitoxin/DON) Nivalenol (NIV) Diacetoxyscirpenol (DAS) 	<ul style="list-style-type: none"> T-2 toxin Satratoxin G Satratoxin H Roridin A Roridin L-2 Ochratoxin A Patulin Dihydrocitrinone Glilotoxin Chaetoglobosin A
Environmental Chemicals	<ul style="list-style-type: none"> 2,4-Dichlorophenoxyacetic Acid (2,4-D) Perchlorate 2,2-bis(4-Chlorophenyl)acetic acid (DDA)Diethyldithiophosphate (DEDTP) Dimethyldithiophosphate (DMDTP) Diethylthiophosphate (DETP) Dimethylphosphate (DMP) Diethylphosphate (DEP) Dimethylthiophosphate (DMTP) Atrazine Atrazine mercapturate Glyphosate 3-Phenoxybenzoic Acid (3PBA) Monoethyl Phthalate (MEP) mono-2-ethylhexyl phthalate (MEHP) 	<ul style="list-style-type: none"> mono-(2-ethyl-5-hydroxyhexyl) phthalate (MEHHP) mono-(2-ethyl-5-oxohexyl) phthalate (MEOHP) Mono-ethyl phthalate (MEtP) Methylparaben Propylparaben Butylparaben Ethylparaben N-acetyl-S-(2-carbamoyl-ethyl)-cysteine (NAE) N-Acetyl (2-Cyanoethyl) Cysteine (NACE) N-Acetyl (2-Hydroxypropyl) Cysteine (NAHP) N-Acetyl (3,4-Dihydroxybutyl) Cysteine (NADB) 	<ul style="list-style-type: none"> 2-Hydroxyethyl Mercapturic Acid (HEMA) N-Acetyl Propyl Cysteine (NAPR) Diphenyl Phosphate (DPP) Tiglylglycine (TG) Bisphenol A (BPA) Triclosan 4-Nonylphenol 2-Methylhippuric Acid (2MHA) 3-Methylhippuric Acid (3MHA) 4-Methylhippuric Acid (4MHA) 2-Hydroxyisobutyric Acid (2HIB) Phenylglyoxylic Acid (PGO) N-acetyl phenyl cysteine (NAP)

Additional Resources



[Environmental Chemicals: Interpretation Guide](#)



[Heavy Metals Intervention Guide](#)



[Mycotoxin Intervention Guide and Mycotoxins-Specific Binding Agents Chart](#)

Regulatory Statement:

This test has been laboratory developed and their performance characteristics determined by Vibrant America LLC, a CLIA-certified laboratory performing the test CLIA#:05D2078809. The test has not been cleared or approved by the U.S. Food and Drug Administration (FDA). Although FDA does not currently clear or approve laboratory-developed tests in the U.S., certification of the laboratory is required under CLIA to ensure the quality and validity of the tests.

Revised 6/25/2024