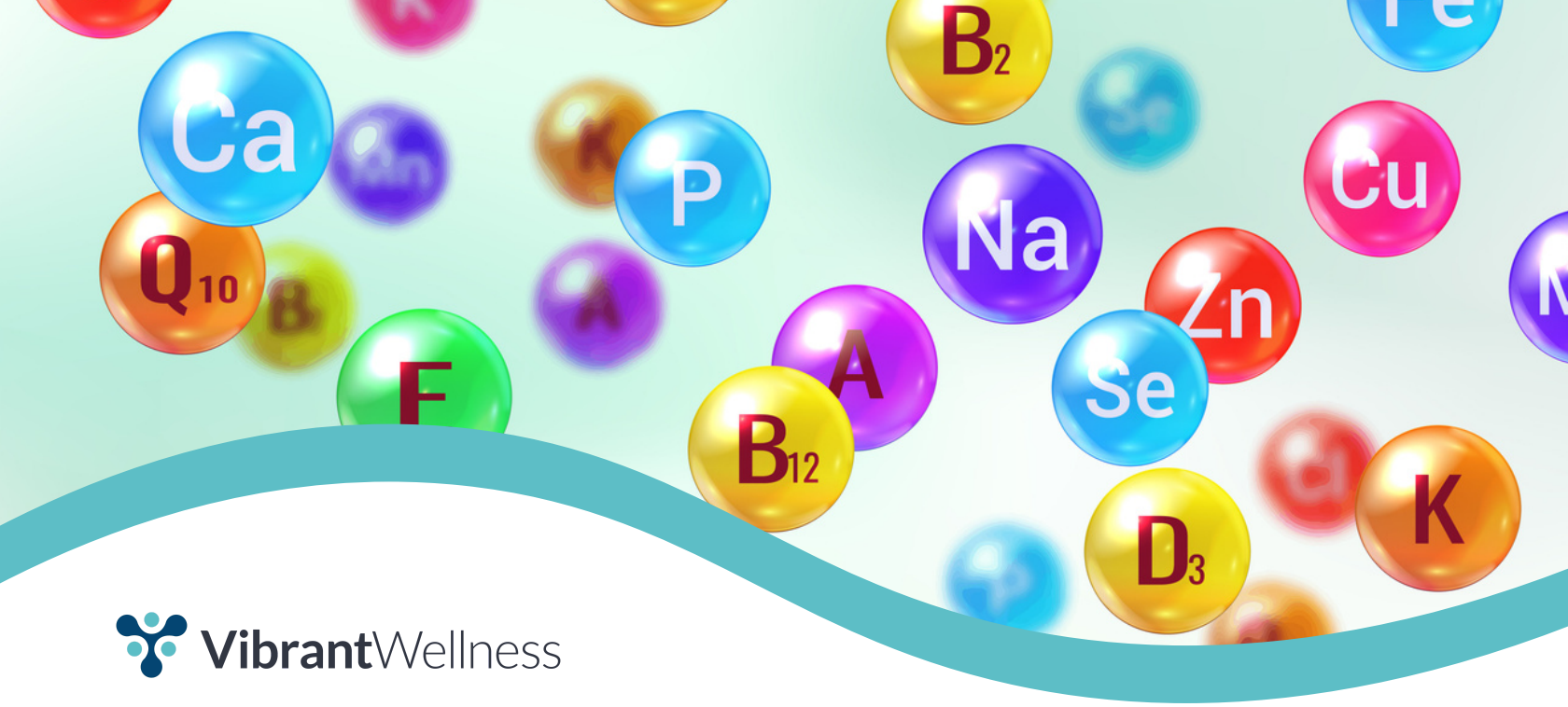


VibrantWellness

Micronutrient Panel

Key Clinical Messages

What is the Micronutrient Panel?

The Micronutrient Panel is a blood test that provides a comprehensive assessment of an individual's extra- and intracellular levels of vitamins, minerals, co-factors, amino acids, metabolites, antioxidants, and essential fatty acids. These nutrients are found in small amounts in foods and are essential for human health.

Intracellular micronutrients have been studied scientifically and have long been considered a more sensitive measure of micronutrient absorption. For example, vitamin C levels in white blood cells (WBCs) have been found to be deficient in Type 2 Diabetes patients as compared to plasma levels. Red blood cell (RBC) folate and magnesium are clinically more significant than whole blood measures of these nutrients. RBC omega-3 and omega-6 fatty acid levels have been found to be markers of accelerated structural and cognitive aging.

Why Order The Micronutrients Panel?

The Micronutrient Panel provides the most complete and accurate picture of a patient's micronutrient status and both short and long-term nutritional status over the previous four months prior to testing.

Treating complex conditions requires the most comprehensive tests to assess all facets of a patient's risk and health profile. Assessing the absorption of nutrients at both the gastrointestinalbarrier and cellular membrane by measuring extra and intracellular levels is the only way to objectively determine the rootcauses of malnutrition and inflammation.

The Micronutrient Panel identifies functional insufficiency, deficiency, overload, or toxicity in extracellular and intracellular micronutrient levels and helps identify impaired micronutrient absorption or cellular transport or uptake, which can cause or increase the risk of chronic diseases.

Which Patients Benefit from This Test?

Conditions, signs, and risks associated with micronutrient deficiencies include:

- Advanced age
- Stress
- Fatigue
- Depression or anxiety
- Diabetes
- Cardiovascular disease
- Arthritis
- Skin problems
- Numbness or tingling in extremities
- Weakened immune response
- Digestive disorders with malabsorption (Celiac, Crohn's, Ulcerative Colitis)
- SIBO (small intestinal bacterial overgrowth)

Which Tests Pair Well with the Micronutrients Panel?

- **Gut Zoomer** –Tests for microbiome, inflammation, and digestion-related influences on nutrient status
- **Wheat Zoomer** – Assesses for increased intestinal permeability (leaky gut), celiac disease, and gluten & wheat sensitivity, all of which can impact nutrient status via malabsorption
- **Food Sensitivity** – Food sensitivities may be a sign of leaky gut and poor digestion, which raise the risk of malnutrition
- **Total Toxic Burden** – Poor nutrient status increases intestinal permeability and impairs detoxification pathways which impacts an individual's total toxic burden

Test Prep

Fasting: Fasting is not required for the Micronutrient Panel; however, serum (extracellular) amino acid results may reflect dietary protein or amino acids consumed 8 hours prior to collecting a blood sample. Intracellular amino acids will not be impacted by fasting status. It is at the ordering provider's clinical discretion whether to recommend fasting before the Micronutrient Panel.

Medication Restrictions: None. However, acute and/or chronic infection may alter total white blood cell count, which may alter white blood cell micronutrient test results. The Micronutrient Panel measures and reports total white blood cell count, neutrophil count, and lymphocyte count, so ordering providers may critically interpret results.

Dietary Supplement Restrictions: None. Ordering providers may decide at their clinical discretion whether to test their patients under supplemented or non-supplemented conditions.

Reference Ranges and Interpretation

The Micronutrient Panel has been validated in adults. Test results are displayed in a graphical format for each Serum, WBC, and RBC micronutrient level as applicable. Graphical reporting has a red and green bar chart to indicate whether a measurement is in-range, out-of-range, borderline low, borderline high, or average. A trendline for the respective patient will be available for historical data along with current results for testing previously performed on the patient.

Micronutrient 'Dial Charts' (bottom-right) classify micronutrients by body system and/or structure and function, scoring each 'Dial Chart' on a scale of 0-100, indicating risk. Green = 86 or above (optimal), Yellow- 40-85 (moderate risk), and Red= <40 (high risk). The Dial Chart Summary Scores assign a different weightage to each micronutrient based on its clinical importance and significance in the body system, structure, and function for each category, so all micronutrients are not scored/weighted evenly in the Dial Chart Summary Score (e.g., EPA will have a higher weightage in the Cardiovascular Health Dial Chart than vitamin E, and zinc will have a lower weightage than vitamin D or vitamin K 2 in the Bone Joint & Muscle Health Dial Chart).

A suggestion table for foods and space for supplement suggestions by the provider is included on the summary page.

Why Vibrant?

Lab Methodology

Vibrant is a **CLIA-certified lab** that utilizes reliable, high-quality methodologies to measure micronutrients at pg/ml level.

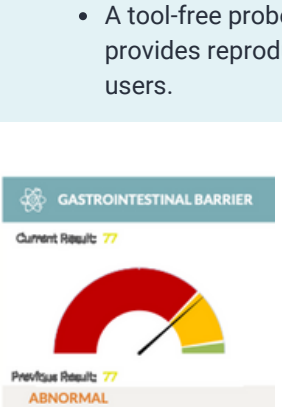
Methodology

The blood sample is spun down so the serum can be taken from the top and RBCs from the bottom. The remaining sample is processed to isolate WBCs. WBC counts are done on an automated cell counter, and intracellular WBC levels are normalized to the WBC count.

All three subsets are processed separately to isolate micronutrients for injection into mass spectrometry. Mass spec provides the highest accuracy of direct measures of micronutrients in serum and within cells.

All micronutrient levels are measured in an advanced state-of-the-art mass spec that provides:

- Increased sensitivity to challenging compounds
- Enhanced detection system with six orders of linear dynamic range to ensure sensitivity is accessible
- A tool-free probe design that provides reproducibility between users.



Example of "Micronutrient Dial Charts"

What Markers Are Included on the Micronutrient Panel?

The Micronutrient Panel provides an in-depth assessment of the following extra- and intracellular levels of micronutrients:

	Extracellular	Intracellular	Red Blood Cell (RBC)
Vitamin A	✓	✓	
Vitamin B1	✓	✓	
Vitamin B2	✓	✓	
Vitamin B3	✓	✓	
Vitamin B5	✓	✓	
Vitamin B6	✓	✓	
Vitamin B12	✓	✓	
Vitamin C	✓	✓	
Vitamin D3	✓	✓	
Vitamin D, 25-OH	✓		
Vitamin E	✓	✓	
Vitamin K1	✓	✓	
Vitamin K2	✓	✓	
Folate	✓		✓
Sodium	✓		
Potassium	✓		
CoQ10	✓	✓	
Cysteine	✓	✓	
Selenium	✓	✓	
Glutathione		✓	
Asparagine	✓	✓	
Glutamine	✓	✓	
Serine	✓	✓	
Citrulline	✓		
Arginine	✓		
Choline	✓	✓	
Inositol	✓	✓	
Carnitine	✓	✓	
Methylmalonic acid (MMA)	✓		
Calcium	✓	✓	
Manganese	✓	✓	
Magnesium			✓
Zinc	✓	✓	
Copper	✓	✓	
Chromium	✓		
Iron	✓		✓
Leucine	✓		
Valine	✓		
Isoleucine	✓		
RBC Omega fatty acids (n3 and n6)			✓
Copper/Zinc Ratio	✓		
AA/EPA Ratio			✓

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 8/9/2023