Blood Chemistry Analysis

Functional Health Report

Patient Report

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An introduction to Functional Blood Chemistry Analysis and your Functional Health Report (FHR).

Introduction

1 What's Inside?
3 FBCA Introduction
4 Patient Report

What's Inside?

An introduction to Functional Blood Chemistry Analysis and your Functional Health Report.

An in-depth functional system and nutrient evaluation.

An in-depth analysis of your biomarker results.

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Functional Blood Chemistry Analysis (FBCA)

Functional Blood Chemistry Analysis is the process by which blood biomarkers are organized, analyzed, and interpreted. It provides a comprehensive assessment of the state of health in the body's main physiological systems. It also gives a window into the body's nutrient status and whether you are trending toward or away from optimal health.

WHY BLOOD TESTING?

Blood has a lot to say about your state of health. The Blood Chemistry and CBC / hematology test is the world's most commonly ordered medical lab test. Blood testing is an integral part of Western clinical medicine and is used to aid in the diagnostic decision-making process. Patients understand and are educated that blood testing is the norm for health assessment.

However, many people start to feel unwell long before a traditional blood test result becomes diagnostic, and more often than not, patients like you are told by their physician that "everything on your blood test looks normal."

"NORMAL" IS NOT OPTIMAL

Most people who feel "unwell" will come out "normal" on a blood test. Clinical experience suggests that these people are by no means "normal" and are a far cry from being functionally optimal. They may not yet have progressed to a known disease state but they are what we call dys-functional, i.e. their physiological systems are no longer functioning properly and they are starting to feel un-well.

The issue is not that the blood test is a poor diagnostic tool, far from it. The issue is that the ranges used on a traditional lab test are based on statistics, not on whether a certain value represents good health or optimal physiological function. The problem is that "normal" reference ranges represent "average" populations rather that the optimal level required to maintain good health. Most "normal" ranges are too broad to adequately detect health problems before they become pathology and are not useful for detecting the emergence of dysfunction.

THE FUNCTIONAL APPROACH

The functional approach to blood test analysis is oriented around functional changes in your body and not pathology. We use ranges that are based on optimal physiology and not the "normal" population. This results in a tighter "Functional Physiological Range", which allows us to evaluate the area within the "Normal" range that indicates that something is not quite right in the physiological systems associated with this biomarker. This gives us the ability to detect changes in your physiological "function". We can identify the factors that obstruct you from achieving optimal physiological, biochemical, and metabolic functioning in your body.

Another thing that separates Functional Blood Chemistry Analysis from the Traditional approach is we are not simply looking at one individual biomarker at a time in a linear report of the data. Rather, we use trend analysis between the individual biomarkers to establish hidden risk trends towards or away from optimal health.

THE FUNCTIONAL HEALTH REPORT

The Functional Health Report results from a detailed algorithmic analysis of your blood test results. Our analytical and interpretive software analyzes the blood test data for its hidden meaning and reveals the subtle, web-like patterns hidden within the numbers that signal the first stages of functional change in your body.

SUMMARY

In closing, Blood testing is no longer simply a part of disease or injury management. It's a vital component of a comprehensive Functional Medicine work up and plays a vital role in uncovering hidden health trends, comprehensive health promotion and disease prevention.

Patient Report

Your report is the result of a detailed and proprietary algorithmic analysis of your complex and comprehensive blood biomarkers.

MR. GERRY GAJADHARSINGH
The Health Equation

THE FUNCTIONAL HEALTH REPORT

Your blood test results have been analyzed for their hidden meaning and the subtle, web-like patterns concealed within the numbers that signal the first stages of functional change in your body. The Functional Health Report (FHR) takes all of this analytical information and provides a comprehensive interpretation of the results in a written and graphical format.

The report gives you a window into the state of health in the main functional physiological systems of the body, its supporting accessory systems, and the degree of deficiency in individual nutrients. The report is broken down into 3 main sections:

ASSESSMENT

The Assessment section is at the very heart of the Functional Health Report. It is here that the findings of the risk analysis are presented.

The Functional Body Systems and Accessory reports show the risk of dysfunction in the various physiological and supporting accessory systems in your body.

The Nutrient Status report gives you an indication of your general nutritional status and the Nutrient Deficiencies report shows the risk of deficiency for individual nutrients.

Each of the assessment reports is accompanied by a section that contains detailed descriptions and explanations of the results presented in each of the reports in this section.

ANALYSIS

The Analysis section shows you the actual results of your blood test itself.

The Blood Test Results Report lists the results of your blood test results and shows you if an individual biomarker is outside of the optimal range and/or outside of the clinical lab range.

The Blood Test Results Comparative Report compares results of the latest and previous blood test and gives you a sense of whether or not there has been an improvement in the individual biomarker results.

The Blood Test History report allows you to compare results over time and see where improvement has been made and allows you to track progress in the individual biomarkers.

The Out of Optimal Range report shows all of the biomarkers that are out of the optimal reference range and gives you some important information as to why each biomarker might be elevated or decreased. Each biomarker in the Out of Optimal Range report hyperlinks back into the Blood Test Results report so you can see a more detailed view of the blood test results.

HEALTH CONCERNS

All the information on the Assessment and Analysis sections of the report are summarized in the Health Concerns section, which focuses on the top areas of need as presented in this report.

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An in-depth functional system and nutrient evaluation.

Assessment

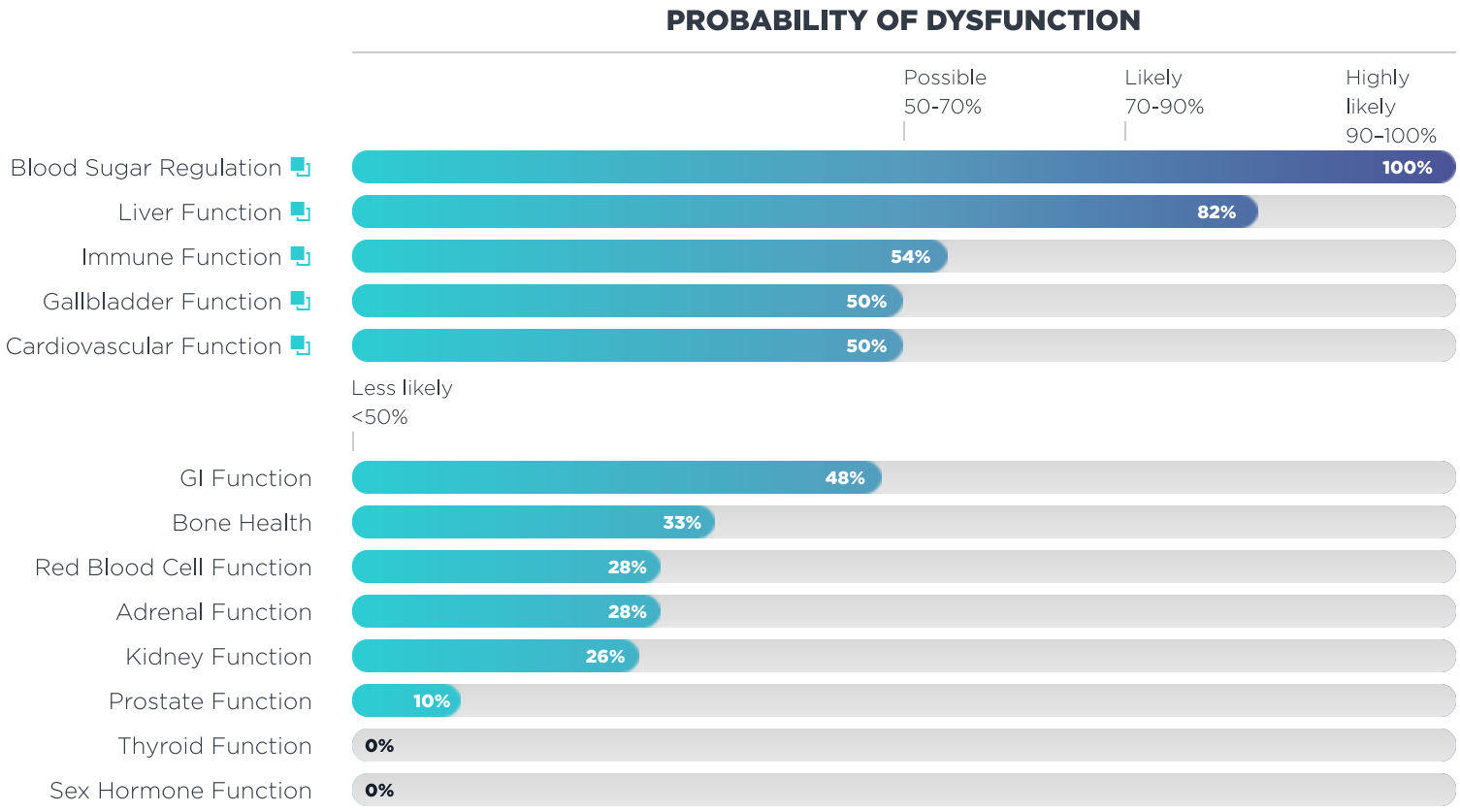
6 Functional Body Systems
9 Accessory Systems
12 Nutrient Status
15 Nutrient Deficiencies

Functional Body Systems

The Functional Body System results represent an algorithmic analysis of this blood test. These results have been converted into your individual Functional Body Systems Report based on our latest research.

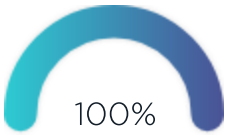
This report gives you an indication of the level of dysfunction that exists in the various physiological systems in your body.

Each Body System that has a probability of dysfunction above 50% is included in the section that follows so you can read a detailed description and individual explanation of the results shown in this report.



Functional Body Systems Details

This section contains detailed descriptions and explanations of the results presented in the Functional Body Systems Report including all the biomarkers considered in the algorithmic analysis and the rationale behind the interpretation.



Dysfunction Highly Likely. Much improvement required.

BLOOD SUGAR REGULATION

The Blood Sugar Regulation score tells us how well your body is regulating blood glucose. Blood sugar dysregulation is very common. It doesn't suddenly emerge but rather develops slowly, so we can look for clues in your blood test that can help us determine if there's dysregulation and if so what it is. Some conditions associated with blood sugar dysregulation include hypoglycemia (periods of low blood sugar), metabolic syndrome, hyperinsulinemia and diabetes.

Rationale

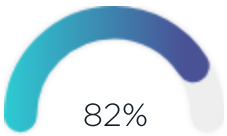
Glucose - Fasting ↑, Triglycerides ↑, HDL Cholesterol ↓

Biomarkers considered

Glucose - Fasting, LDH, Cholesterol - Total, Triglycerides, LDL Cholesterol, HDL Cholesterol

Biomarkers not available - consider having run in future tests:

Hemoglobin A1C, Insulin - Fasting, DHEA-S - Male, Leptin - Male, C-Peptide, Fructosamine



Dysfunction Likely Improvement required.

LIVER FUNCTION

The Liver Function score reflects the degree of function in your liver. The liver has over 500 known functions. It is involved in detoxification, digestion, the hormonal system, the immune system, controlling blood sugar, storing nutrients, and protein and fat metabolism. The liver also produces a substance called bile that is stored in the gallbladder. Bile is essential for proper fat digestion and is also a major route of elimination for the body. Factors affecting liver function include the accumulation of fat within the liver (a condition called fatty liver), inflammation of the liver cells from infections, toxins, etc. (a condition called hepatitis), actual damage to the liver cells themselves (a condition called cirrhosis) or a decrease in the ability of the liver to detoxify, which leads to detoxification issues. There are biomarkers in the blood that we can measure that can indicate the relative function of the liver.

Rationale

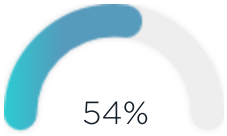
ALT ↑, AST ↑, LDH ↑, Cholesterol - Total ↓, Ferritin ↑, Protein - Total ↓

Biomarkers considered

ALT, BUN, Albumin, Globulin - Total, Albumin : Globulin, Alk Phos, AST, LDH, Bilirubin - Total, Cholesterol - Total, Iron - Serum, Ferritin, GGT, Protein - Total, AST : ALT

Biomarkers not available - consider having run in future tests:

Bilirubin - Direct



Dysfunction Possible
There may be improvement needed in certain areas.

IMMUNE FUNCTION

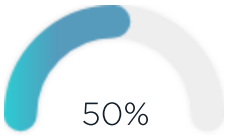
The Immune Function score allows us to assess the state of function in your immune system. When the immune system is in a state of balance we are able to cope and deal with infections with little or no lasting negative side effects. Biomarkers on a blood test allow us to check and see if the immune system is in a state of balance or not. Some of the factors to consider include a low functioning immune system (a condition called immune insufficiency), bacterial or viral infections, or GI dysfunction associated with decreased immune function: abnormal immunity in the gut lining, a decrease in immune cell function in the gut or an increase in abnormal bacteria, etc. in the gut (a condition called dysbiosis).

Rationale

Total WBCs ↓, Globulin - Total ↓, Neutrophils - % ↑, Monocytes - % ↑, Ferritin ↑

Biomarkers considered

Total WBCs, Globulin - Total, Neutrophils - %, Lymphocytes - %, Monocytes - %, Monocytes - Absolute, Lymphocytes - Absolute, Neutrophils - Absolute, Albumin, Alk Phos, Ferritin



Dysfunction Possible
There may be improvement needed in certain areas.

GALLBLADDER FUNCTION

The Gallbladder Function score reflects the degree of function in your gallbladder. The gallbladder plays an essential role in helping your body digest the fat in the diet. It does this through the release of a substance called bile. Bile is not only essential for fat digestion but it also helps the body get rid of certain toxins and also excess cholesterol from the body. Factors affecting gallbladder function include the inability of the liver to produce bile (a condition called biliary insufficiency), the progressive thickening of the bile in the gallbladder (a condition called biliary stasis), or the presence of obstructions in the gallbladder itself (a condition called biliary obstruction).

Rationale

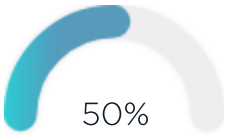
AST : ALT ↑, Cholesterol - Total ↓, ALT ↑, LDH ↑

Biomarkers considered

GGT, AST : ALT, Alk Phos, Cholesterol - Total, ALT, LDH, Bilirubin - Total, Triglycerides

Biomarkers not available - consider having run in future tests:

Gastrin, Bilirubin - Direct



Dysfunction Possible
There may be improvement needed in certain areas.

CARDIOVASCULAR FUNCTION

It is possible that you may be in the early stages of increased cardiovascular risk. While this may not require immediate attention, we will want to keep an eye on this on future blood tests.

Rationale

Triglyceride:HDL ↑, Glucose - Fasting ↑, LDH ↑, Triglycerides ↑, HDL Cholesterol ↓, Ferritin ↑

Biomarkers considered

Triglyceride:HDL, Glucose - Fasting, LDH, Cholesterol - Total, Triglycerides, LDL Cholesterol, HDL Cholesterol, Ferritin

Biomarkers not available - consider having run in future tests:

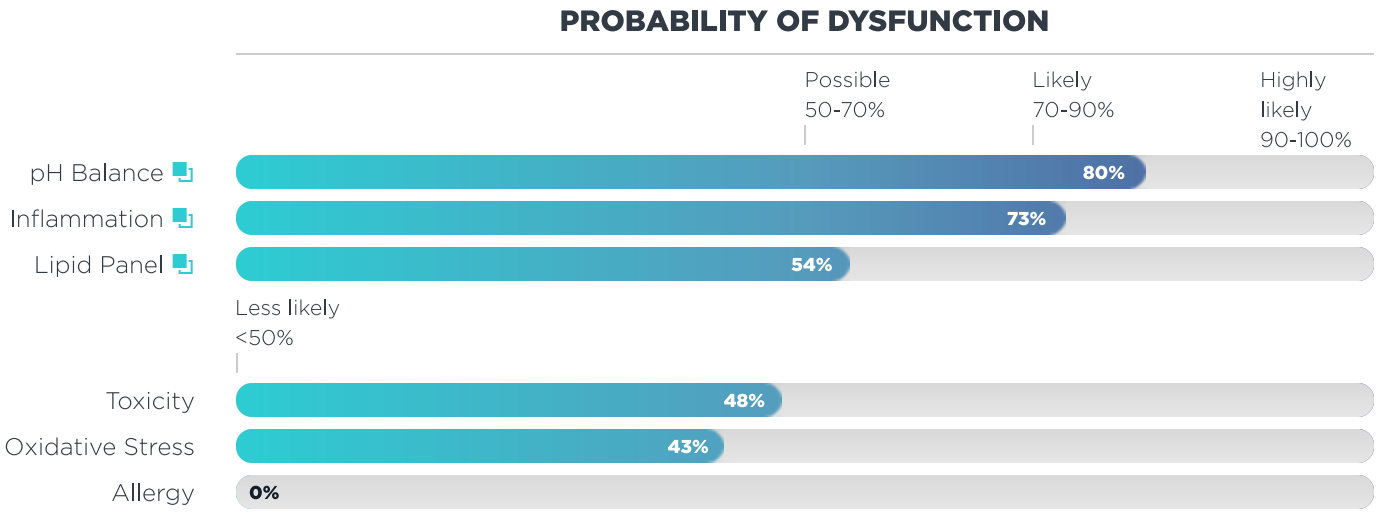
Lipoprotein (a), Fibrinogen, Hs CRP - Male, Homocysteine, Hemoglobin A1C, Estradiol - Male, Testosterone Total - Male, Insulin - Fasting, Vitamin D (25-OH), Testosterone Free - Male

Accessory Systems

The Accessory Systems are additional physiological systems that are not related to individual organs or body systems.

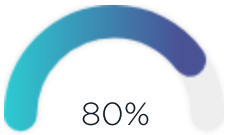
The Accessory Systems Report represents an algorithmic analysis of this blood test. These results have been converted into an individualized risk evaluation based on the latest research.

Each Accessory System that has a probability of dysfunction above 50% is included in the section that follows so you can read a detailed description and individual explanation of the results shown in this report.



Accessory Systems Details

This section contains detailed descriptions and explanations of the results presented in the Accessory Systems report including all the biomarkers considered in the algorithmic analysis and the rationale behind the interpretation.



Dysfunction Likely.
Improvement required.

PH BALANCE

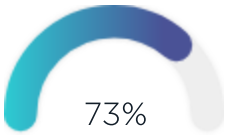
Your risk of an imbalance in your pH system is quite likely. The pH Balance score can help us pinpoint imbalances in the body's pH (acid-alkaline) regulation system. You are trending towards a higher risk of imbalance. Please work with your physician to help bring this score down in future blood test results.

Rationale

Anion Gap ↑, CO2 ↓, Calcium ↓

Biomarkers considered

Anion Gap, Potassium, Chloride, CO2, Calcium



Dysfunction Likely.
Improvement required.

INFLAMMATION

The Inflammation score can help us identify whether or not you are suffering from inflammation. This is important because inflammation can be silent, i.e. not have any symptoms. A number of biomarkers on a blood test can indicate the presence of inflammation. These are markers of inflammation and are not specific to any particular inflammatory condition or disease but they can help us look at the underlying dysfunctions that are the true cause of inflammation in the body.

Rationale

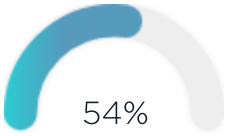
LDH ↑, Cholesterol - Total ↓, Ferritin ↑, Creatine Kinase ↑, ALT ↑, RDW ↑

Biomarkers considered

Uric Acid - Male, LDH, Cholesterol - Total, Triglycerides, HDL Cholesterol, Iron - Serum, Ferritin, ESR - Male, Lymphocytes - %, Basophils - %, Creatine Kinase, ALT, RDW

Biomarkers not available - consider having run in future tests:

Hs CRP - Male, Fibrinogen, Homocysteine, Myeloperoxidase (MPO), Vitamin D (25-OH), C-Reactive Protein



Dysfunction Possible. There may be improvement needed in certain areas.

LIPID PANEL

It is possible that you are trending towards the early stages of hyperlipidemia, which is causing an increase in your Lipid Panel score. While this may not require immediate attention, we will want to keep an eye on this in future blood tests.

Rationale

Triglycerides ↑, Triglyceride:HDL ↑, HDL Cholesterol ↓

Biomarkers considered

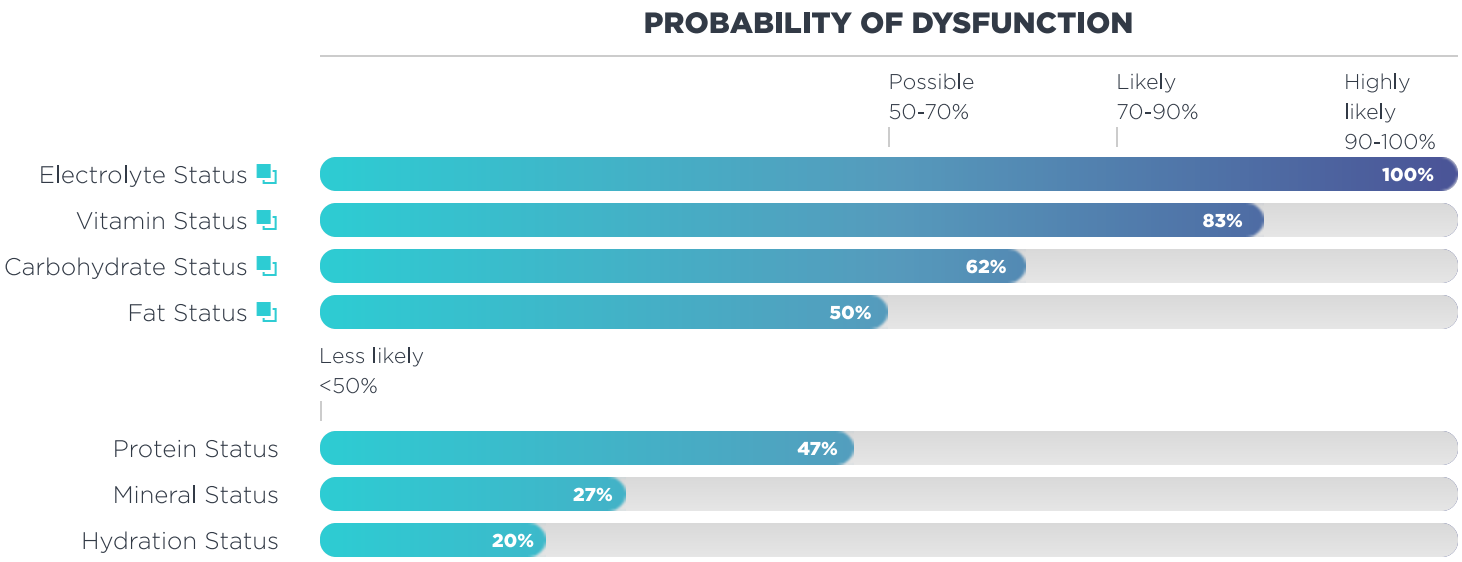
Cholesterol - Total, Triglycerides, LDL Cholesterol, Cholesterol : HDL, Triglyceride:HDL, HDL Cholesterol

Nutrient Status

The Nutrient Status results represent an algorithmic analysis of this blood test. These results have been converted into your individual Nutrient Status Report based on our latest research.

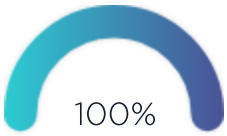
This report gives you an indication of your general nutritional status. The Nutrient Status is influenced by actual dietary intake, digestion, absorption, assimilation, and cellular uptake of the nutrients themselves.

Each Nutrient category that has a probability of dysfunction above 50% is included in the section that follows so you can read a detailed description and individual explanation of the results shown in this report.



Nutrient Status Details

This section contains detailed descriptions and explanations of the results presented in the Nutrient Status report including all the biomarkers considered in the algorithmic analysis and the rationale behind the interpretation.



Dysfunction Highly Likely. Much improvement required.

ELECTROLYTE STATUS

The Electrolyte Status score gives us a sense of the balance of electrolytes in your body. Electrolytes such as calcium, potassium, sodium, and magnesium are essential for optimal health and wellness. An electrolyte imbalance can show up as low blood pressure, cold hands or feet, poor circulation, swelling in the ankles, and immune insufficiency.

Rationale

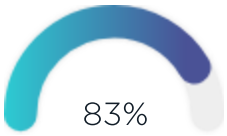
Calcium ↓, Phosphorus ↓

Biomarkers considered

Sodium, Potassium, Chloride, Calcium, Phosphorus

Biomarkers not available - consider having run in future tests:

Magnesium - Serum



Dysfunction Likely. Improvement required.

VITAMIN STATUS

You may be trending towards a vitamin deficiency or need, causing an increase in your Vitamin Status score. Vitamin levels are constantly fluctuating based on a number of factors, such as the amount in your diet, your ability to digest and break down individual vitamins from the food or supplements you consume, the ability of those vitamins to be absorbed, transported and ultimately taken up into the cells themselves.

Rationale

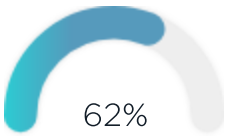
Anion Gap ↑, MCV ↑

Biomarkers considered

Anion Gap, Albumin, AST, ALT, GGT, MCV

Biomarkers not available - consider having run in future tests:

Homocysteine, Vitamin D (25-OH), Methylmalonic Acid, Folate - Serum, Vitamin B12



Dysfunction Possible. There may be improvement needed in certain areas.

CARBOHYDRATE STATUS

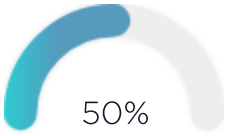
You may be in the early stages of having difficulties handling your dietary intake of carbohydrates, especially refined carbohydrates and sugars. This may begin to cause shifts in your ability to regulate blood sugar. While this may not require immediate attention, we will want to keep an eye on this on future blood tests.

Rationale

Glucose - Fasting ↑, Phosphorus ↓, Triglycerides ↑, HDL Cholesterol ↓

Biomarkers considered

Glucose - Fasting, Phosphorus, LDH, Cholesterol - Total, Triglycerides, LDL Cholesterol, HDL Cholesterol, Total WBCs



Dysfunction Possible. There may be improvement needed in certain areas.

FAT STATUS

The Fat Status score gives us an assessment of a fatty acid deficiency in your body. We do this by measuring biomarkers in the blood that can indicate fat deficiencies in the diet itself and also for the ability of your body to handle the fats that you do consume in your diet. A deficiency in Essential Fatty Acids (EFAs) is quite common. EFAs are fats that are essential for life and include the Omega 6 and Omega 3 fats, essential fats that are found in evening primrose oil, fish oils, flaxseed oil, etc.

Rationale

Cholesterol - Total ↓

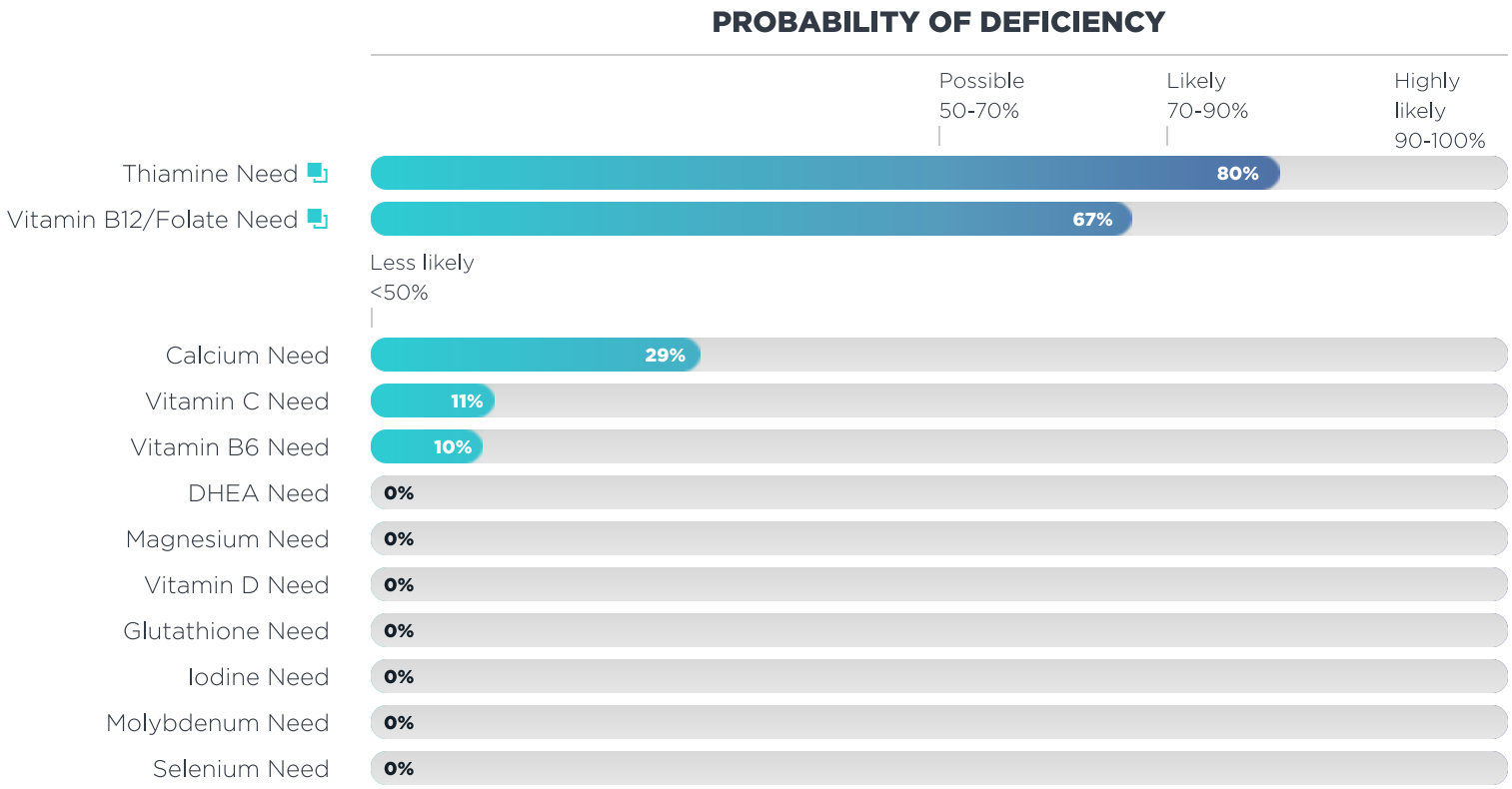
Biomarkers considered

Cholesterol - Total, Triglycerides, GGT, Bilirubin - Total

Individual Nutrient Deficiencies

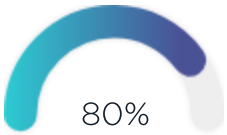
The values represent the degree of deficiency for individual nutrients based on your blood results. The status of an individual nutrient is based on a number of factors such as actual dietary intake, digestion, absorption, assimilation and cellular uptake of the nutrients themselves. All of these factors will be taken into consideration before determining whether or not you actually need an individual nutrient.

Each individual Nutrient Deficiency that has a probability of dysfunction above 50% is included in the section that follows so you can read a detailed description and individual explanation of the results shown in this report.



Individual Nutrient Deficiency Details

This section contains detailed descriptions and explanations of the results presented in the Nutrient Deficiencies report including all the biomarkers considered in the algorithmic analysis and the rationale behind the interpretation.



Deficiency Likely.
Improvement required.

THIAMINE NEED

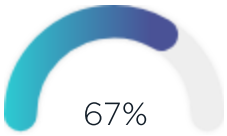
You may be trending toward a thiamine need, causing an increase in your Thiamine Need score.

Rationale

Anion Gap ↑, CO2 ↓, Glucose - Fasting ↑

Biomarkers considered

Anion Gap, CO2, Glucose - Fasting, LDH, Hemoglobin - Male, Hematocrit - Male



Deficiency Possible.
There may be improvement needed in certain areas.

VITAMIN B12/FOLATE NEED

You may be in the early stages of vitamin B12/Folate need, causing your vitamin B12/Folate Need score to rise. While this may not require immediate attention, you will want to watch this on future blood tests.

Rationale

MCV ↑, LDH ↑, RDW ↑

Biomarkers considered

MCV, LDH, Uric Acid - Male, Albumin, Total WBCs, RBC - Male, Hemoglobin - Male, Hematocrit - Male, MCH, MCHC, RDW, Neutrophils - %

Biomarkers not available - consider having run in future tests:

Methylmalonic Acid, Homocysteine, Folate - Serum, Vitamin B12

Blood Test Results

The Blood Test Results Report lists the results from your Chemistry Screen and CBC and shows you whether or not an individual biomarker is outside of the optimal range and/or outside of the clinical lab range. The biomarkers are grouped into their most common categories.

Some biomarkers in the Blood Test Results Report that are above or below the Optimal or Standard Range may be hyperlinked into the "Out of Optimal Range Report", so you can read some background information on those biomarkers and why they may be high or low.

Alarm Low	Low	Below Optimal	Optimal	Above Optimal	High	Alarm High	Total
0	1	10	33	13	7	1	65

BLOOD GLUCOSE

Glucose - Fasting
6.40 mmol/L

Low	Below Optimal	Optimal	Above Optimal	High
< 3.61	3.61 - 4.16	4.16 - 4.77	4.77 - 5.50	> 5.50

KIDNEY

BUN
5.60 mmol/L urea

Low	Below Optimal	Optimal	Above Optimal	High
< 2.50	2.50 - 3.57	3.57 - 5.71	5.71 - 8.92	> 8.92

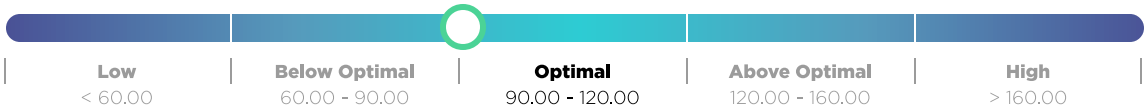
Creatinine
69.00 µmol/L

Low	Below Optimal	Optimal	Above Optimal	High
< 35.36	35.36 - 70.72	70.72 - 97.24	97.24 - 132.60	> 132.60

BUN : Creatinine
0.08 Ratio

Low	Below Optimal	Optimal	Above Optimal	High
< 0.02	0.02 - 0.04	0.04 - 0.06	0.06 - 0.09	> 0.09

eGFR
90.00 mL/min/1.73m2



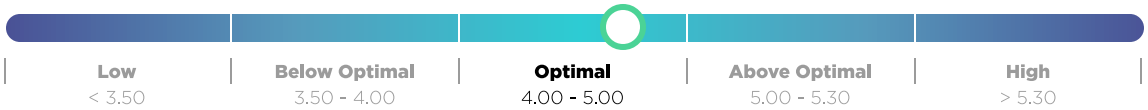
PROSTATE

PSA - Total
1.54 µg/L

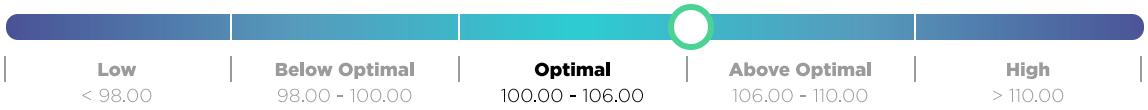
ELECTROLYTES

Sodium
142.00 mmol/L

Potassium
4.70 mmol/L

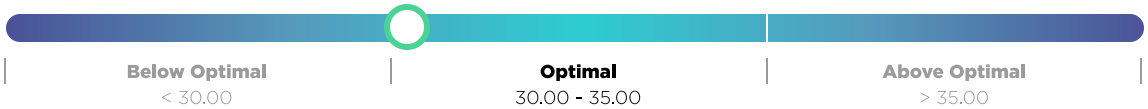


Chloride
106.00 mmol/L



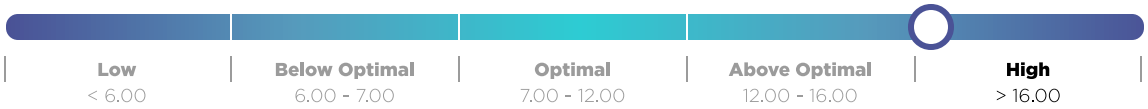
CO2
24.00 mmol/L

Sodium : Potassium
30.21 ratio

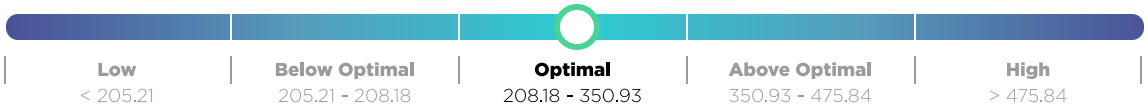


METABOLIC

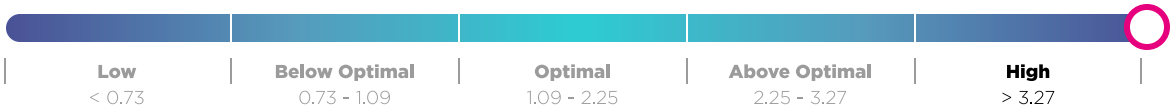
Anion Gap
16.70 mmol/L



Uric Acid - Male
281.00 µmol/L

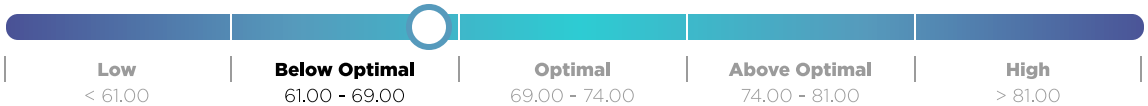


Creatine Kinase
4.24 µkat/L ⚠

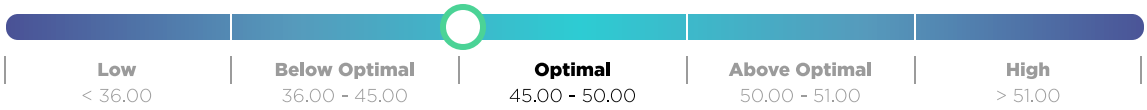


PROTEINS

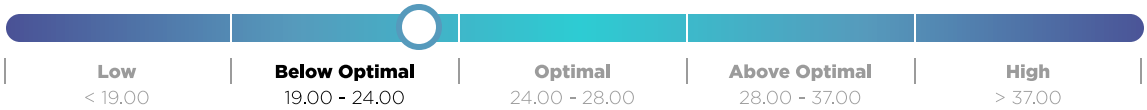
Protein - Total
68.00 g/L



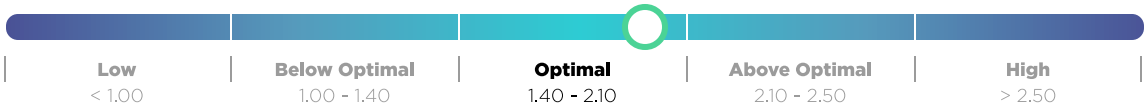
Albumin
45.00 g/L



Globulin - Total
23.00 g/L

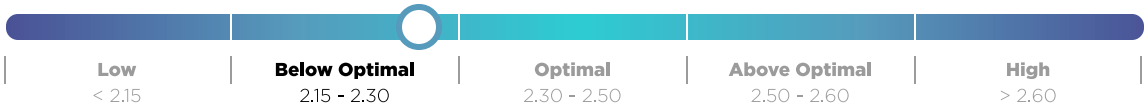


Albumin : Globulin
1.96 ratio

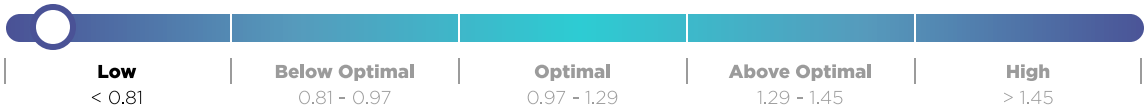


MINERALS

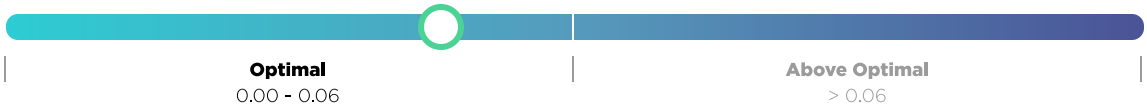
Calcium
2.27 mmol/L



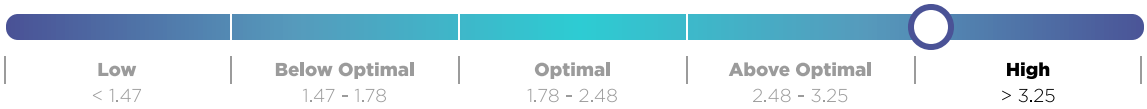
Phosphorus
0.68 mmol/L



Calcium : Albumin
0.05 ratio

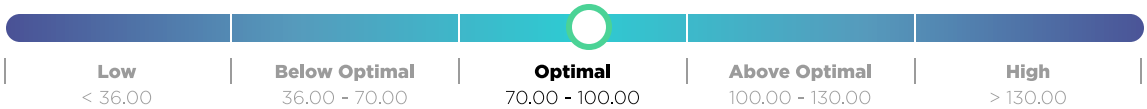


Calcium : Phosphorus
3.34 ratio



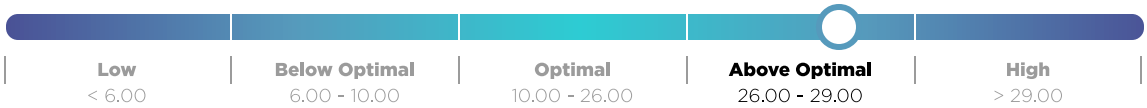
LIVER AND GB

Alk Phos
87.00 IU/L



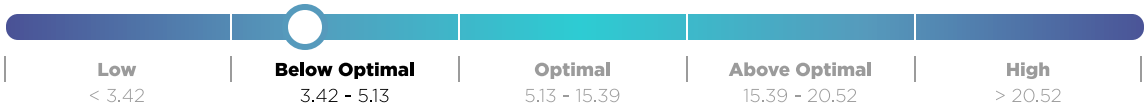
AST
30.00 U/L

ALT
28.00 U/L



LDH
216.00 U/L

Bilirubin - Total
4.00 µmol/L

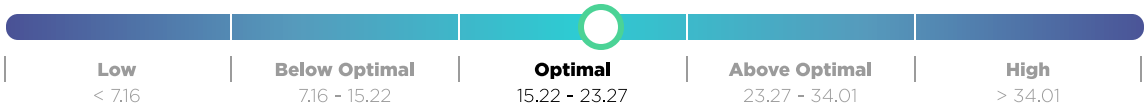


GGT
12.00 U/L

AST : ALT
1.07 Ratio

IRON MARKERS

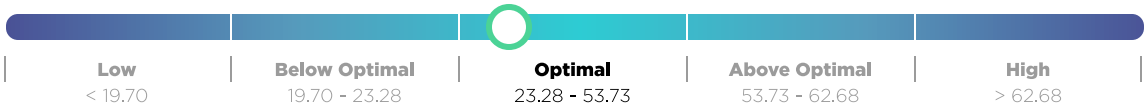
Iron - Serum
20.40 µmol/L



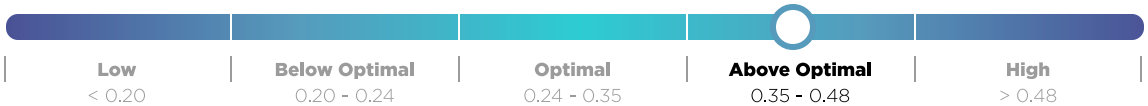
Ferritin
394.00 µg/L

TIBC
50.00 µmol/L

UIBC
29.60 µmol/L

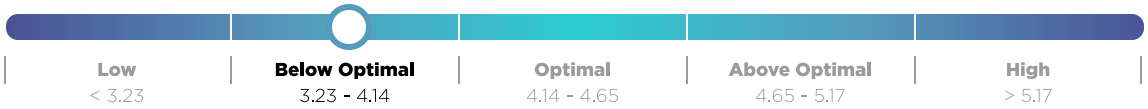


% Transferrin saturation
0.41 fraction saturation



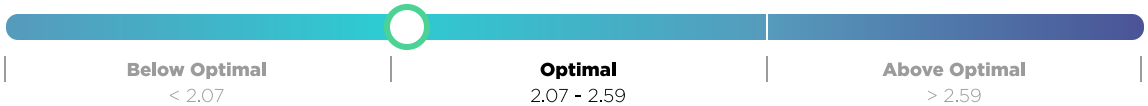
LIPIDS

Cholesterol - Total
3.70 mmol/L

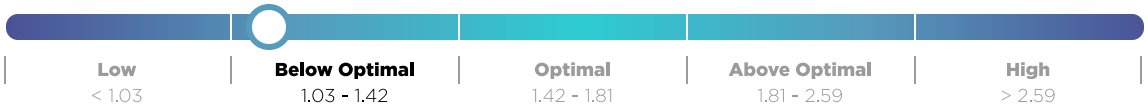


Triglycerides
1.20 mmol/L

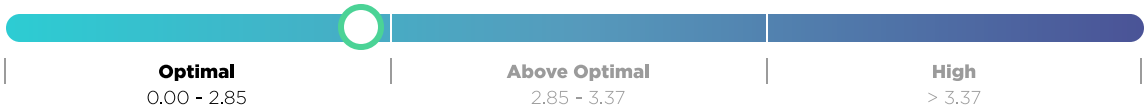
LDL Cholesterol
2.10 mmol/L



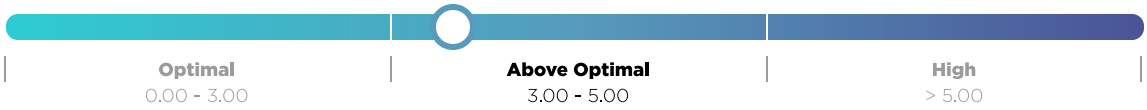
HDL Cholesterol
1.10 mmol/L



Non-HDL Cholesterol
2.60 mmol/L

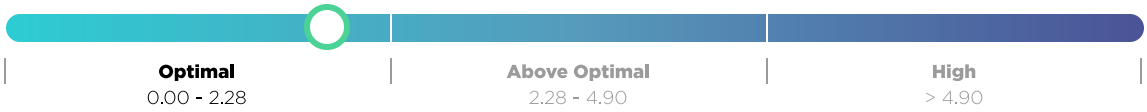


Cholesterol : HDL
3.36 Ratio



Triglyceride:HDL
1.09 ratio

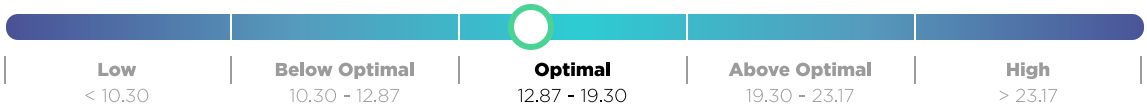
LDL : HDL - Male
1.91 Ratio



THYROID

TSH
2.08 mU/L

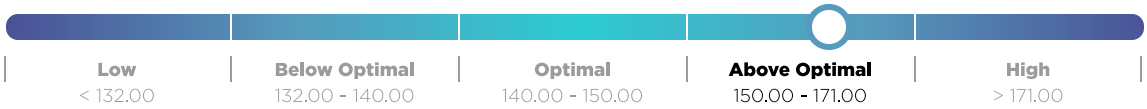
T4 - Free
15.00 pmol/L



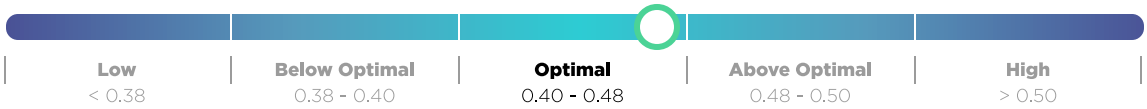
CBC/HEMATOLOGY

RBC - Male
5.11 10E12/L

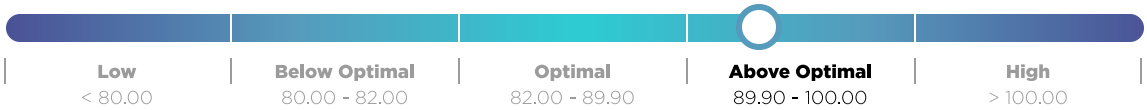
Hemoglobin - Male
163.00 g/L



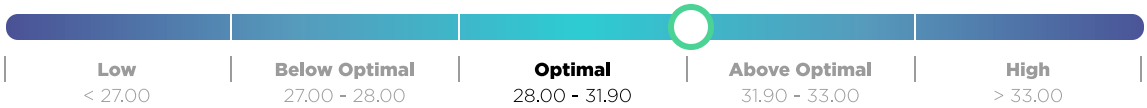
Hematocrit - Male
0.47 Prop. of 1.0



MCV
93.00 fL

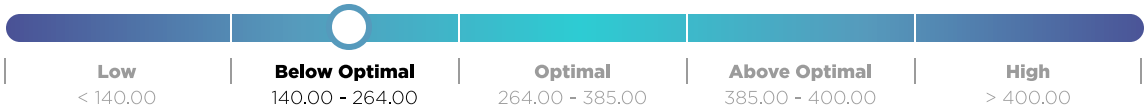


MCH
31.90 pg



MCHC
343.00 g/L

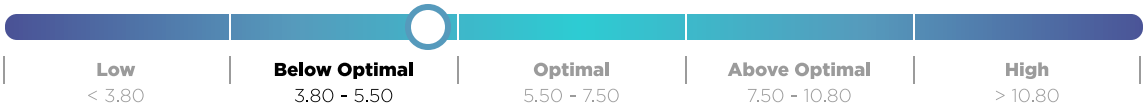
Platelets
205.00 x10E9/L



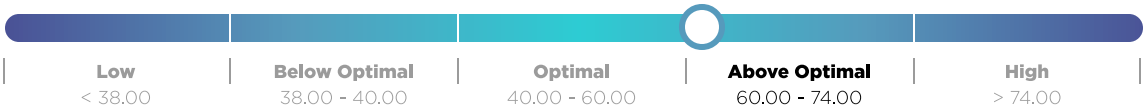
RDW
13.50 %

WHITE BLOOD CELLS

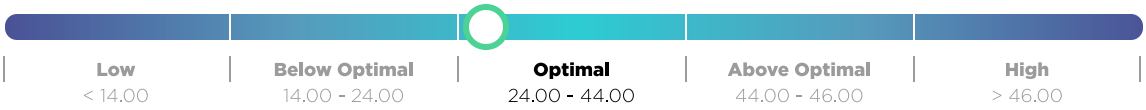
Total WBCs
5.32 giga/L



Neutrophils - %
60.70 %

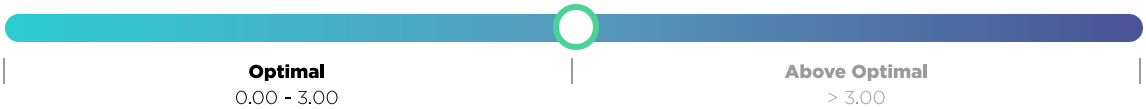


Lymphocytes - %
26.70 %

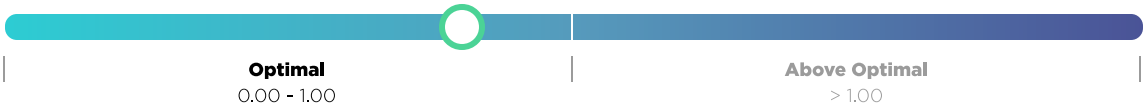


Monocytes - %
8.80 %

Eosinophils - %
3.00 %

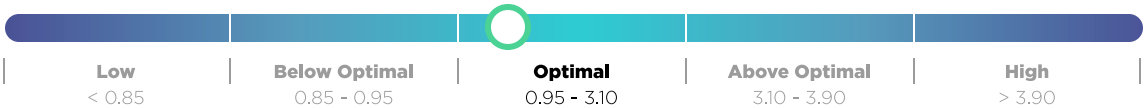


Basophils - %
0.80 %

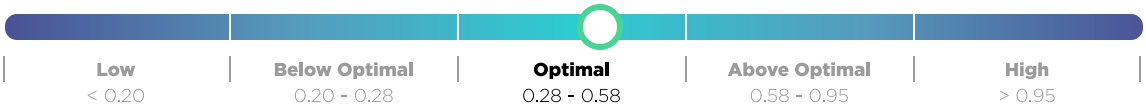


Neutrophils - Absolute
3.23 giga/L

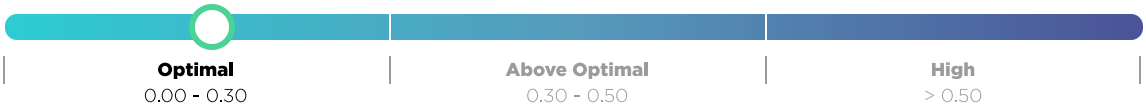
Lymphocytes - Absolute
1.42 giga/L



Monocytes - Absolute
0.47 giga/L

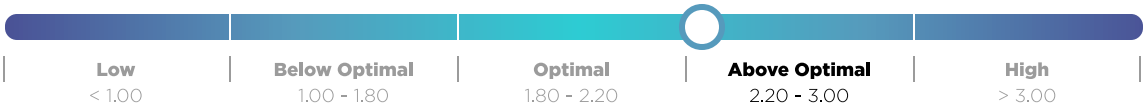


Eosinophils - Absolute
0.16 giga/L



Basophils - Absolute
0.04 giga/L

Neutrophil : Lymphocyte
2.27 Ratio



INFLAMMATION

ESR - Male

2.00 mm/hr

Blood Test Results Comparative

The Blood Test Results Comparative Report lists the results of this blood test and compares it to a previous blood test thus allowing you to visualize change in your biomarker results. The thumbs-up and down icons help to show change, whether it is moving in the right direction or further away from optimal. Even though a result may be out of the optimal or standard range, a thumbs up indicates that the most recent result is moving toward optimal.

Comparative total number of biomarkers by optimal range

	Alarm Low	Low	Below Optimal	Optimal	Above Optimal	High	Alarm High
Current	0	1	10	33	13	7	1
Previous	0	0	0	0	0	0	0

Biomarker	Quest Current Apr 05 2023	Optimal range	Standard range	Units
Glucose - Fasting	6.40 ↑↑	4.16 - 4.77	3.61 - 5.50	mmol/L
BUN	5.60	3.57 - 5.71	2.50 - 8.92	mmol/L urea
Creatinine	69.00 ↓	70.72 - 97.24	35.36 - 132.60	µmol/L
BUN : Creatinine	0.08 ↑	0.04 - 0.06	0.02 - 0.09	Ratio
eGFR	90.00	90.00 - 120.00	60.00 - 160.00	mL/min/1.73m2
PSA - Total	1.54	0.00 - 2.50	0.00 - 4.00	µg/L
Sodium	142.00	135.00 - 142.00	135.00 - 146.00	mmol/L
Potassium	4.70	4.00 - 5.00	3.50 - 5.30	mmol/L
Chloride	106.00	100.00 - 106.00	98.00 - 110.00	mmol/L
CO2	24.00 ↓	25.00 - 30.00	19.00 - 30.00	mmol/L
Sodium : Potassium	30.21	30.00 - 35.00	30.00 - 35.00	ratio
Anion Gap	16.70 ↑↑	7.00 - 12.00	6.00 - 16.00	mmol/L
Uric Acid - Male	281.00	208.18 - 350.93	205.21 - 475.84	µmol/L
Creatine Kinase	4.24 !	1.09 - 2.25	0.73 - 3.27	µkat/L
Protein - Total	68.00 ↓	69.00 - 74.00	61.00 - 81.00	g/L

Biomarker	Quest Current Apr 05 2023	Optimal range	Standard range	Units
Albumin	45.00	45.00 - 50.00	36.00 - 51.00	g/L
Globulin - Total	23.00 ↓	24.00 - 28.00	19.00 - 37.00	g/L
Albumin : Globulin	1.96	1.40 - 2.10	1.00 - 2.50	ratio
Calcium	2.27 ↓	2.30 - 2.50	2.15 - 2.60	mmol/L
Phosphorus	0.68 ↓ ↓	0.97 - 1.29	0.81 - 1.45	mmol/L
Calcium : Albumin	0.05	0.00 - 0.06	0.00 - 0.06	ratio
Calcium : Phosphorus	3.34 ↑ ↑	1.78 - 2.48	1.47 - 3.25	ratio
Alk Phos	87.00	70.00 - 100.00	36.00 - 130.00	IU/L
AST	30.00 ↑	10.00 - 26.00	10.00 - 35.00	U/L
ALT	28.00 ↑	10.00 - 26.00	6.00 - 29.00	U/L
LDH	216.00 ↑ ↑	140.00 - 200.00	100.00 - 200.00	U/L
Bilirubin - Total	4.00 ↓	5.13 - 15.39	3.42 - 20.52	µmol/L
GGT	12.00	10.00 - 17.00	3.00 - 90.00	U/L
AST : ALT	1.07 ↑ ↑	0.00 - 1.00	0.00 - 1.00	Ratio
Iron - Serum	20.40	15.22 - 23.27	7.16 - 34.01	µmol/L
Ferritin	394.00 ↑ ↑	30.00 - 70.00	38.00 - 380.00	µg/L
TIBC	50.00	44.78 - 62.68	44.78 - 76.12	µmol/L
UIBC	29.60	23.28 - 53.73	19.70 - 62.68	µmol/L
% Transferrin saturation	0.41 ↑	0.24 - 0.35	0.20 - 0.48	fraction saturation
Cholesterol - Total	3.70 ↓	4.14 - 4.65	3.23 - 5.17	mmol/L
Triglycerides	1.20 ↑	0.79 - 0.90	0.00 - 1.69	mmol/L
LDL Cholesterol	2.10	2.07 - 2.59	0.00 - 2.59	mmol/L
HDL Cholesterol	1.10 ↓	1.42 - 1.81	1.03 - 2.59	mmol/L
Non-HDL Cholesterol	2.60	0.00 - 2.85	0.00 - 3.37	mmol/L
Cholesterol : HDL	3.36 ↑	0.00 - 3.00	0.00 - 5.00	Ratio
Triglyceride:HDL	1.09 ↑ ↑	0.22 - 0.83	0.00 - 0.87	ratio
LDL : HDL - Male	1.91	0.00 - 2.28	0.00 - 4.90	Ratio
TSH	2.08	1.30 - 3.00	0.40 - 4.50	mU/L
T4 - Free	15.00	12.87 - 19.30	10.30 - 23.17	pmol/L
RBC - Male	5.11 ↑	4.20 - 4.90	4.20 - 5.80	10E12/L
Hemoglobin - Male	163.00 ↑	140.00 - 150.00	132.00 - 171.00	g/L
Hematocrit - Male	0.47	0.40 - 0.48	0.38 - 0.50	Prop. of 1.0
MCV	93.00 ↑	82.00 - 89.90	80.00 - 100.00	fL
MCH	31.90	28.00 - 31.90	27.00 - 33.00	pg
MCHC	343.00	340.00 - 360.00	320.00 - 360.00	g/L
Platelets	205.00 ↓	264.00 - 385.00	140.00 - 400.00	x10E9/L
RDW	13.50 ↑	11.00 - 12.60	11.00 - 15.00	%
Total WBCs	5.32 ↓	5.50 - 7.50	3.80 - 10.80	giga/L
Neutrophils - %	60.70 ↑	40.00 - 60.00	38.00 - 74.00	%
Lymphocytes - %	26.70	24.00 - 44.00	14.00 - 46.00	%
Monocytes - %	8.80 ↑	0.00 - 7.00	4.00 - 13.00	%
Eosinophils - %	3.00	0.00 - 3.00	0.00 - 3.00	%
Basophils - %	0.80	0.00 - 1.00	0.00 - 1.00	%

Biomarker	Quest Current Apr 05 2023	Optimal range	Standard range	Units
Neutrophils - Absolute	3.23	1.90 - 4.20	1.50 - 7.80	giga/L
Lymphocytes - Absolute	1.42	0.95 - 3.10	0.85 - 3.90	giga/L
Monocytes - Absolute	0.47	0.28 - 0.58	0.20 - 0.95	giga/L
Eosinophils - Absolute	0.16	0.00 - 0.30	0.00 - 0.50	giga/L
Basophils - Absolute	0.04	0.00 - 0.10	0.00 - 0.20	giga/L
Neutrophil : Lymphocyte	2.27 ↑	1.80 - 2.20	1.00 - 3.00	Ratio
ESR - Male	2.00	0.00 - 5.00	0.00 - 15.00	mm/hr

Blood Test History

The Blood Test History Report lists the results of your blood test results side by side with the latest test listed on the right-hand side. This report allows you to compare results over time and see where improvement has been made, allowing you to track your progress towards optimal health.

Key

- Optimal
- Above / Below Optimal
- Above / Below Standard
- Alarm High / Alarm Low

Biomarker	Latest Test Result Quest Apr 05 2023
Glucose - Fasting	6.40 ↑↑
BUN	5.60
Creatinine	69.00 ↓
BUN : Creatinine	0.08 ↑
eGFR	90.00
PSA - Total	1.54
Sodium	142.00
Potassium	4.70
Chloride	106.00
CO2	24.00 ↓
Sodium : Potassium	30.21
Anion Gap	16.70 ↑↑
Uric Acid - Male	281.00
Creatine Kinase	4.24 ⚠
Protein - Total	68.00 ↓
Albumin	45.00
Globulin - Total	23.00 ↓
Albumin : Globulin	1.96

Biomarker	Latest Test Result Quest Apr 05 2023
Calcium	2.27 ↓
Phosphorus	0.68 ↓ ↓
Calcium : Albumin	0.05
Calcium : Phosphorus	3.34 ↑ ↑
Alk Phos	87.00
AST	30.00 ↑
ALT	28.00 ↑
LDH	216.00 ↑ ↑
Bilirubin - Total	4.00 ↓
GGT	12.00
AST : ALT	1.07 ↑ ↑
Iron - Serum	20.40
Ferritin	394.00 ↑ ↑
TIBC	50.00
UIBC	29.60
% Transferrin saturation	0.41 ↑
Cholesterol - Total	3.70 ↓
Triglycerides	1.20 ↑
LDL Cholesterol	2.10
HDL Cholesterol	1.10 ↓
Non-HDL Cholesterol	2.60
Cholesterol : HDL	3.36 ↑
Triglyceride:HDL	1.09 ↑ ↑
LDL : HDL - Male	1.91
TSH	2.08
T4 - Free	15.00

Biomarker	Latest Test Result Quest Apr 05 2023
RBC - Male	5.11 ↑
Hemoglobin - Male	163.00 ↑
Hematocrit - Male	0.47
MCV	93.00 ↑
MCH	31.90
MCHC	343.00
Platelets	205.00 ↓
RDW	13.50 ↑
Total WBCs	5.32 ↓
Neutrophils - %	60.70 ↑
Lymphocytes - %	26.70
Monocytes - %	8.80 ↑
Eosinophils - %	3.00
Basophils - %	0.80
Neutrophils - Absolute	3.23
Lymphocytes - Absolute	1.42
Monocytes - Absolute	0.47
Eosinophils - Absolute	0.16
Basophils - Absolute	0.04
Neutrophil : Lymphocyte	2.27 ↑
ESR - Male	2.00

Out of Optimal Range

The following report shows all of the biomarkers that are out of the optimal reference range and gives you some important information as to why each biomarker might be elevated or decreased.

Each biomarker in the Out of Optimal Range report hyperlinks back into the Blood Test Results report so you can a see a more detailed view of the blood test result itself.

Total number of biomarkers by optimal range

Alarm Low	Low	Below Optimal	Optimal	Above Optimal	High	Alarm High	Total
0	1	10	33	13	7	1	65

Above Optimal

394.00 µg/L

FERRITIN

Ferritin is the main storage form of iron in the body. Increased levels are associated with iron overload, an increasing risk of cardiovascular disease, inflammation and oxidative stress.

6.40 mmol/L

GLUCOSE - FASTING

Blood glucose levels are regulated by several important hormones including insulin and glucagon. Glucose is also directly formed in the body from carbohydrate digestion and from the conversion in the liver of other sugars, such as fructose, and fat into glucose. Increased blood glucose is associated with type 1 & 2 diabetes, metabolic syndrome, and insulin resistance.

1.20
mmol/L

TRIGLYCERIDES

Serum triglycerides are composed of fatty acid molecules that enter the bloodstream either from the liver or from the diet. Levels will be elevated in metabolic syndrome, fatty liver, in people with an increased risk of cardiovascular disease, hypothyroidism, and adrenal dysfunction

4.24
µkat/L

CREATINE KINASE

Creatine Kinase (CPK) is a group of enzymes found in skeletal muscle, the brain, and the heart muscle. Damage to one or more of these tissues will liberate CPK into the serum thus raising serum levels. Increased levels of CPK are associated with muscle damage or breakdown, damage to the heart muscle as in an acute MI, heavy exercise, and brain damage or inflammation.

163.00
g/L

HEMOGLOBIN - MALE

Hemoglobin is the oxygen carrying molecule in red blood cells. Hemoglobin levels may be increased in cases of dehydration.

3.34
ratio

CALCIUM : PHOSPHORUS

The Calcium:Phosphorus ratio is determined from the serum calcium and serum phosphorus levels. This ratio is maintained by the parathyroid glands and is also affected by various foods. A high ratio is often caused by high serum calcium and low serum phosphorus, so investigating the reasons for this is important. A diet high in refined carbohydrates can decrease serum phosphorus thus increasing the Calcium:Phosphorus ratio.

16.70
mmol/L

ANION GAP

The anion gap is the measurement of the difference between the sum of the sodium and potassium levels and the sum of the serum CO2/bicarbonate and chloride levels. Increased levels are associated with thiamine deficiency and metabolic acidosis.

0.08
Ratio

BUN : CREATININE

The BUN/Creatinine is a ratio between the BUN and Creatinine levels. An increased level is associated with renal dysfunction.

13.50
%

RDW

The Red Cell Distribution Width (RDW) is essentially an indication of the degree of abnormal variation in the size of red blood cells (called anisocytosis). Although the RDW will increase with vitamin BI2 deficiency, folic acid, and iron anemia, it is increased most frequently with vitamin B12 deficiency anemia.

0.41
fraction saturation

% TRANSFERRIN SATURATION

The % transferrin saturation index is a calculated value that tells how much serum iron is bound to the iron-carrying protein transferrin. A % transferrin saturation value of 15% means that 15% of iron-binding sites of transferrin is being occupied by iron. It is a sign of iron overload or too much iron in the blood if it is above the optimal range.

1.09
ratio

TRIGLYCERIDE:HDL

The Triglyceride:HDL ratio is determined from serum triglyceride and HDL levels. Increased ratios are associated with increased cardiovascular risk and an increased risk of developing insulin resistance and Type II Diabetes.

93.00
fL

MCV

The MCV is a measurement of the volume in cubic microns of an average single red blood cell. MCV indicates whether the red blood cell size appears normal (normocytic), small (microcytic), or large (macrocytic). An increase or decrease in MCV can help determine the type of anemia present. An increased MCV is associated with B12, folate, or vitamin C deficiency.

5.11
10E12/L

RBC - MALE

The RBC Count determines the total number of red blood cells or erythrocytes found in a cubic millimeter of blood. The red blood cell functions to carry oxygen from the lungs to the body tissues and to transfer carbon dioxide from the tissues to the lungs where it is expelled. Increased levels are associated with dehydration, stress, a need for vitamin C and respiratory distress such as asthma.

216.00
U/L

LDH

LDH represents a group of enzymes that are involved in carbohydrate metabolism. Increased levels of LDH are used to evaluate the presence of tissue damage to the cell causing a rupture in the cellular cytoplasm. LDH is found in many of the tissues of the body, especially the heart, liver, kidney, skeletal muscle, brain, red blood cells, and lungs. Damage to any of these tissues will cause an elevated serum LDH level.

8.80
%

MONOCYTES - %

Monocytes are white blood cells that are the body's second line of defense against infection. They are phagocytic cells that are capable of movement and remove dead cells, microorganisms, and particulate matter from circulating blood. Levels tend to rise at the recovery phase of an infection or with chronic infection.

30.00
U/L

AST

AST is an enzyme present in highly metabolic tissues such as skeletal muscle, the liver, the heart, kidney, and lungs. This enzyme is at times released into the bloodstream following cell damage or destruction. AST levels will be increased when liver cells and/or heart muscle cells and/or skeletal muscle cells are damaged. The cause of the damage must be investigated.

2.27
Ratio

NEUTROPHIL : LYMPHOCYTE

The neutrophil-lymphocyte ratio (NLR) reflects important components of the cell-mediated inflammatory response, i.e. neutrophils and lymphocytes. Elevated levels are seen in bacterial infections and are considered a marker of systemic inflammation and metabolic dysfunction such as metabolic syndrome and thyroid dysfunction.

28.00
U/L

ALT

ALT is an enzyme present in high concentrations in the liver and to a lesser extent skeletal muscle, the heart, and kidney. ALT will be liberated into the bloodstream following cell damage or destruction. Any condition or situation that causes damage to the hepatocytes will cause leakage of ALT into the bloodstream. These include exposure to chemicals, viruses (viral hepatitis, mononucleosis, cytomegalovirus, Epstein Barr, etc.), alcoholic hepatitis. The most common non-infectious cause of an increased ALT is a condition called steatosis (fatty liver).

3.36
Ratio

CHOLESTEROL : HDL

The ratio of total cholesterol to HDL is a far better predictor of cardiovascular disease than cholesterol by itself. A lower ratio is ideal because you want to lower cholesterol (but not too low) and raise HDL. A level below 3.0 would be ideal. Every increase of 1.0, i.e. 3.0 to 4.0 increases the risk of heart attack by 60%.

1.07
Ratio

AST : ALT

The AST:ALT ratio, also known as the De Ritis ratio, provides a tool for assessing and monitoring liver function and the progression and the severity of liver disease. An increasing AST:ALT ratio above 1 is associated with a trend towards progressive impairment of liver function

60.70
%

NEUTROPHILS - %

Neutrophils are the white blood cells used by the body to combat bacterial infections and are the most numerous and important white cell in the body's reaction to inflammation. Neutrophils - % tells us the % distribution of neutrophils in the total white blood cell count. Levels will be increased in bacterial infections.

Below Optimal

0.68
mmol/L

PHOSPHORUS

Phosphorous levels, like calcium, are regulated by parathyroid hormone (PTH). Phosphate levels are closely tied with calcium, but they are not as strictly controlled as calcium. Plasma levels may be decreased after a high carbohydrate meal or in people with a diet high in refined carbohydrates. Serum phosphorous is a general marker for digestion. Decreased phosphorous levels are associated with hypochlorhydria.

3.70
mmol/L

CHOLESTEROL - TOTAL

Cholesterol is a steroid found in every cell of the body and in the plasma. It is an essential component in the structure of the cell membrane where it controls membrane fluidity. It provides the structural backbone for every steroid hormone in the body, which includes adrenal and sex hormones and vitamin D. The myelin sheaths of nerve fibers are derived from cholesterol and the bile salts that emulsify fats are composed of cholesterol. Cholesterol is made in the body by the liver and other organs and from dietary sources. The liver, the intestines, and the skin produce between 60-80% of the body's cholesterol. The remainder comes from the diet. Decreased cholesterol levels are a strong indicator of gallbladder dysfunction, oxidative stress, inflammatory process, low-fat diets, and an increased heavy metal burden.

1.10
mmol/L

HDL CHOLESTEROL

HDL functions to transport cholesterol from the peripheral tissues and vessel walls to the liver for processing and metabolism into bile salts. It is known as “good cholesterol” because it is thought that this process of bringing cholesterol from the peripheral tissue to the liver is protective against atherosclerosis. Decreased HDL is considered atherogenic (tending towards the formation of fatty plaques in the artery).

205.00
x10E9/L

PLATELETS

Platelets or thrombocytes are the smallest of the formed elements in the blood. Platelets are necessary for blood clotting, vascular integrity, and vasoconstriction. They form a platelet plug, which plugs up breaks in small vessels. Decreased levels are associated with oxidative stress, heavy metal body burden and infections.

23.00
g/L

GLOBULIN - TOTAL

Globulins constitute the body's antibody system and Total globulin is a measurement of all the individual globulin fractions in the blood. Decreased levels are associated with inflammation in the digestive system and immune insufficiency.

24.00
mmol/L

CO2

Carbon Dioxide is a measure of bicarbonate in the blood. CO2, as bicarbonate, is available for acid-base balancing. Bicarbonate neutralizes metabolic acids in the body. Decreased levels are associated with metabolic acidosis.

68.00
g/L

PROTEIN - TOTAL

Total serum protein is composed of albumin and total globulin. Conditions that affect albumin and total globulin readings will impact the total protein value. A decreased total protein can be an indication of malnutrition, digestive dysfunction due to HCl need, or liver dysfunction. Malnutrition leads to a decreased total protein level in the serum primarily from lack of available essential amino acids.

2.27
mmol/L

CALCIUM

Serum calcium levels, which are tightly regulated within a narrow range, are principally regulated by parathyroid hormone (PTH) and vitamin D. A low calcium level indicates that calcium regulation is out of balance and not necessarily that the body is deficient of calcium and needs supplementation. Check vitamin D levels, rule out hypochlorhydria (low stomach acid), the need for magnesium, phosphorous, vitamin A, B and C, unsaturated fatty acids, and iodine as some of the reasons for a calcium "need" before supplementing with calcium.

4.00
µmol/L

BILIRUBIN - TOTAL

The total bilirubin is composed of two forms of bilirubin: Indirect or unconjugated bilirubin, which circulates in the blood on its way to the liver and direct or conjugated bilirubin, which is the form of bilirubin made water-soluble before it is excreted in the bile. A decreased bilirubin has been associated with a trend towards oxidative stress.

69.00
µmol/L

CREATININE

Creatinine is produced primarily from the contraction of muscle and is removed by the kidneys. Decreased levels are associated with muscle loss.

5.32
giga/L

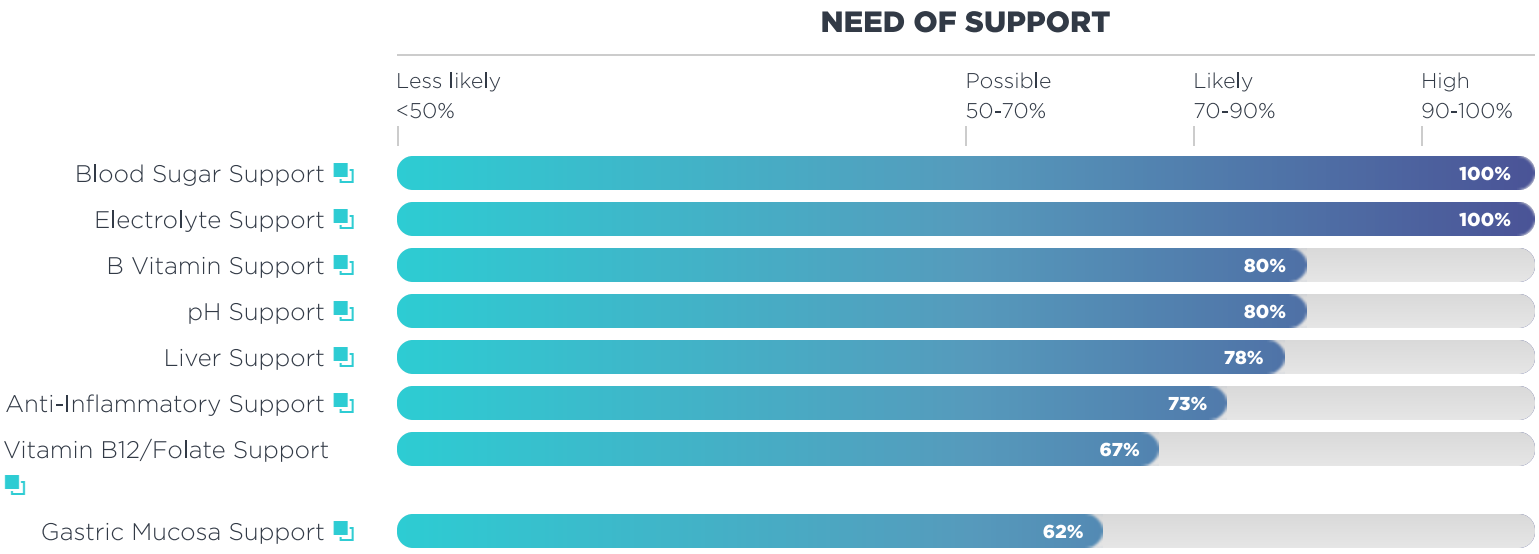
TOTAL WBCS

The total White Blood Cell (WBC) count measures the sum of all the WBCs in the peripheral blood. Decreased total White Blood Cell Levels are associated with chronic bacterial or viral infections, immune insufficiency, and may be seen in people eating a raw food diet.

Health Concerns

The Health Concerns report takes all the information on the Functional Health Report and focuses on the health concerns that need the most support.

Each area of health concern that needs support is included in the section that follows so you can read a detailed description and individual explanation of the results shown in this report.



Health Concerns Details

This section contains an explanation of the results presented in the Health Concerns report including all the biomarkers considered in the algorithmic analysis and the rationale behind the interpretation.

BLOOD SUGAR SUPPORT

The results of your blood test indicate a tendency towards metabolic syndrome and a need for blood sugar support.

Rationale

Glucose - Fasting ↑, Triglycerides ↑, HDL Cholesterol ↓

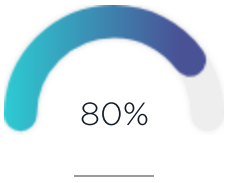
ELECTROLYTE SUPPORT

The results of your blood test indicate that your electrolytes might be lower than optimal and shows a need for electrolyte/mineral supplementation.

Rationale

Calcium ↓, Phosphorus ↓

B VITAMIN SUPPORT

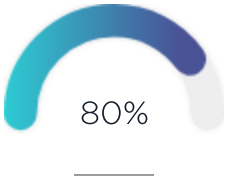


The results of your blood test indicate that your B vitamin levels might be lower than optimal and shows a need for B complex supplementation.

Rationale

Anion Gap ↑, CO2 ↓, Glucose - Fasting ↑

PH SUPPORT

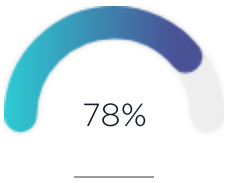


The results of your blood test indicate a tendency towards metabolic acidosis and a need for pH support.

Rationale

Anion Gap ↑, CO2 ↓, Calcium ↓

LIVER SUPPORT

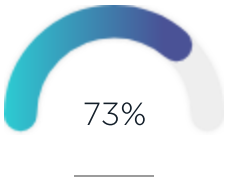


The results of your blood test indicate a tendency towards liver dysfunction and a need for liver support.

Rationale

ALT ↑, Ferritin ↑, AST ↑, Cholesterol - Total ↓, LDH ↑, Protein - Total ↓

ANTI-INFLAMMATORY SUPPORT

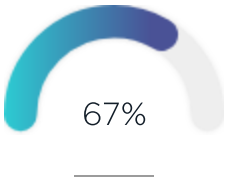


The results of your blood test indicate a tendency towards inflammation and show a need for anti-inflammatory support.

Rationale

LDH ↑, Cholesterol - Total ↓, Ferritin ↑, Creatine Kinase ↑, RDW ↑, ALT ↑

VITAMIN B12/FOLATE SUPPORT

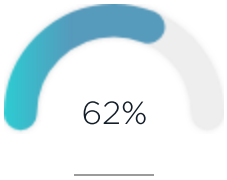


The results of your blood test indicate that your vitamin B12/folate levels might be lower than optimal and shows a need for vitamin B12/folate supplementation.

Rationale

MCV ↑, LDH ↑, RDW ↑

GASTRIC MUCOSA SUPPORT



The results of your blood test indicate a tendency towards gastric inflammation and a need for support for the stomach lining.

Rationale

Globulin - Total ↓, Protein - Total ↓, Creatinine ↓, Phosphorus ↓

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