careninja

Blood Chemistry Analysis

Functional Health Report

Practitioner Report

Prepared for	Male Sample 56 year old male born Nov 01, 1966 Fasting
Requested by	Dr. Zamir Hilman Hamzah Careninja PLT
Collected Date	Jan 29, 2023
Lab	Quest
Powered by	ODX | OptimalDX

What's Inside?

An introduction to Functional Blood Chemistry Analysis and this report.

An in-depth functional system and nutrient evaluation.

A full breakdown of all individual biomarker results, showing distance from optimal, comparative and historical views.

SECTION 1: INTRODUCTION

SECTION 2: ASSESSMENT

SECTION 3: ANALYSIS

The health concerns that need the most support.

Additional notes and information pertinent to this report.

SECTION 4: HEALTH CONCERNS

SECTION 5: APPENDIX

1

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

Introduction

Dr. Zamir Hilman Hamzah's Report

This report highlights the notes made about the results of this blood test.

REPORT

Health Goals:

1. Lose weight, especially around the abdomen
2. Improve sleep
3. Improve Improve energy
4. Improve joint and muscle pain, and decrease inflammation

Signs and Symptoms

The following signs and symptoms were reported:

1. Irritable before meals
2. Crave coffee or sugar in afternoon
3. sleepy in afternoon
4. arthritic tendencies
5. Difficulty falling asleep
6. Decreased libido
7. Difficulty losing weight

Functional Blood Chemistry Analysis (FBCA)

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

WHY BLOOD TESTING?

Blood has a lot to tell us about our state of health and the blood chemistry and CBC / hematology test is the most commonly ordered medical lab test worldwide. These blood tests are an integral part of Western clinical medicine and are 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 feel unwell long before a traditional blood test becomes diagnostic. More often than not, our patients are told by their physician that "everything on your blood test looks normal."

"NORMAL" IS NOT OPTIMAL

Most patients 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 chem screen and CBC analysis is oriented around changes in physiology and not pathology. We use ranges based on optimal physiology, not the "normal" population. This results in a tighter "Functional Physiological Range," which allows us to evaluate the area within the "Normal" range to detect patients with changes in physiological "function." We can identify the factors that obstruct the patient from achieving optimal physiological, biochemical, and metabolic functioning in their body.

Another thing that separates the 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 a client's otherwise hidden trend towards or away from a functional health optimal.

THE FUNCTIONAL HEALTH REPORT

The Functional Health Report is the result of 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 the 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.

Practitioner Report

Your Practitioner Report is the result of a detailed and proprietary algorithmic analysis of your patient's complex and comprehensive blood biomarkers.

DR. ZAMIR HILMAN HAMZAH
Careninja PLT

THE FUNCTIONAL HEALTH REPORT

The Functional Health Report uniquely organizes and creates an interpretation providing a comprehensive insight and assessment into the state of previously hidden health trends of the main body systems, its supporting body accessory systems, along with reporting on the status of key nutrients and trends to and from clinical dysfunction.

The 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 the body.

ASSESSMENT

The Assessment section is at the very heart of the Functional Health Report. It is here that the findings of the algorithmic trend analysis are presented. The Functional Body Systems and Accessory Reports show the level of dysfunction that exists in the various physiological systems in the body.

The Nutrient Systems report gives you an indication of your client's general nutritional status as well as the degree of deficiency for individual nutrients.

The Assessment section also includes the Practitioner Only "Clinical Dysfunctions Report", which lists the individual dysfunctions and conditions themselves that may be causing the changes seen in the Body and Accessory Systems reports.

ANALYSIS

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

The Blood Test Results Report lists the results of the patient's 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 patient's latest and previous Chemistry Screen and Hematology test and gives you a sense of whether or not there has been an improvement on the individual biomarker level.

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.

A Blood Test Score report is made showing which markers exhibit the largest shifts away from an optimal norm either higher or lower.

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.

Based on the results of the analysis of this blood test, there may be a "Recommended Further Testing" report, which indicates areas that may require further investigation.

APPENDIX

The appendix may contain the "What to Look For" report, which contains detailed descriptions and interpretation explanations of each biomarker that is out of optimal giving you even more information on dysfunctions associated with each biomarker.

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An in-depth functional system and nutrient evaluation.

Assessment

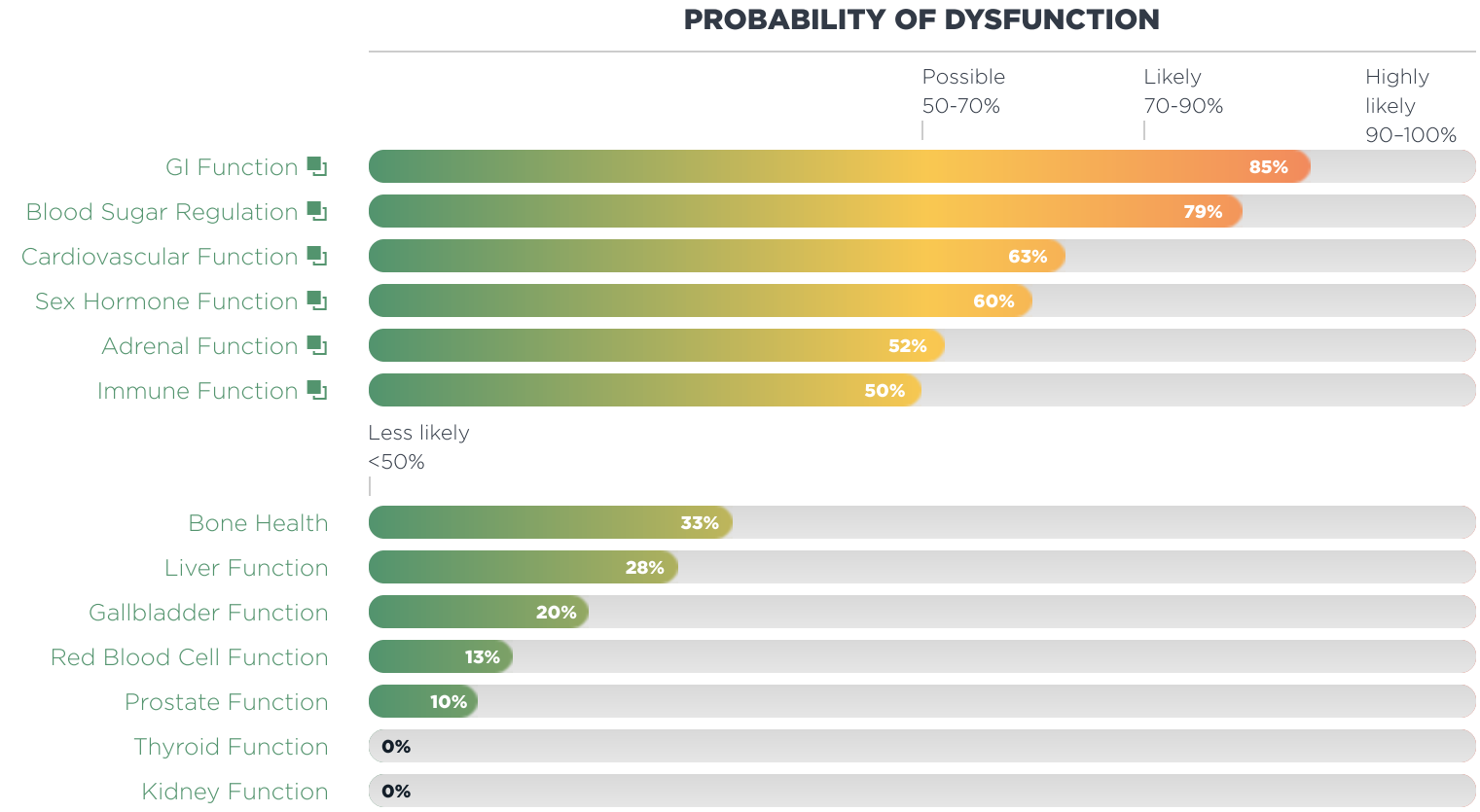
Functional Body Systems

The Functional Body System results represent an algorithmic analysis of this blood test. These results have been converted into your client's 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 the body.

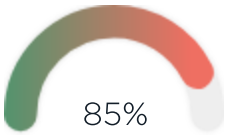
Please use this report in conjunction with the "Practitioner's Only Clinical Dysfunctions Report" to identify which dysfunctions and conditions are causing changes in the Functional Body Systems.

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 Likely Improvement required.

GI FUNCTION

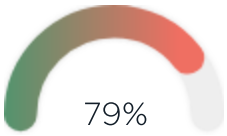
It is likely that your patient is trending towards dysfunction in their GI system. This could be emerging hypochlorhydria, inflammation of the gastric mucosa, H. pylori, pancreatic insufficiency, dysbiosis, or intestinal hyperpermeability. Please refer to the "Clinical Dysfunctions" report to get a sense of the probability of dysfunction in these "conditions".

Rationale

BUN ↓, Protein - Total ↓, Globulin - Total ↑, Albumin ↓, Phosphorus ↓, Alk Phos ↓, MCV ↑, Eosinophils - % ↑, Iron - Serum ↓, Creatinine ↓, Anion Gap ↑, Calcium ↓, Total WBCs ↓, Gastrin ↓

Biomarkers considered

BUN, Protein - Total, Globulin - Total, Albumin, Phosphorus, Alk Phos, MCV, Eosinophils - %, Basophils - %, Iron - Serum, Creatinine, Chloride, Anion Gap, Calcium, Total WBCs, Gastrin



Dysfunction Likely Improvement required.

BLOOD SUGAR REGULATION

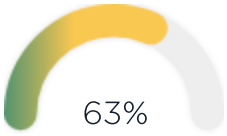
It is likely that your patient is trending towards blood sugar dysregulation. This could be emerging hypoglycemia, early stages of dysglycemia, metabolic syndrome, or insulin resistance. Please refer to the "Clinical Dysfunctions" report to get a sense of the probability of dysfunction in these "conditions".

Rationale

Glucose - Fasting ↑, LDH ↓, Insulin - Fasting ↑, Cholesterol - Total ↑, LDL Cholesterol ↑, DHEA-S - Male ↓

Biomarkers considered

Glucose - Fasting, LDH, Hemoglobin A1C, Insulin - Fasting, Cholesterol - Total, Triglycerides, LDL Cholesterol, HDL Cholesterol, DHEA-S - Male, Leptin - Male, C-Peptide, Fructosamine



Dysfunction Possible
There may be improvement needed in certain areas.

CARDIOVASCULAR FUNCTION

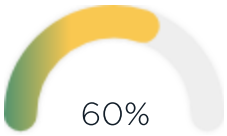
It is possible that your patient is in the early stages of increased cardiovascular risk. While this may not require immediate attention, you may want to keep an eye on this on future blood tests.

Rationale

Glucose - Fasting ↑, Cholesterol - Total ↑, Triglycerides ↑, LDL Cholesterol ↑, Homocysteine ↑, Testosterone Total - Male ↓, Insulin - Fasting ↑, Testosterone Free - Male ↓

Biomarkers considered

Triglyceride:HDL, Glucose - Fasting, AST, LDH, Cholesterol - Total, Triglycerides, LDL Cholesterol, HDL Cholesterol, Ferritin, Fibrinogen, Hs CRP - Male, Homocysteine, Hemoglobin A1C, Estradiol - Male, Testosterone Total - Male, Insulin - Fasting, Vitamin D (25-OH), Testosterone Free - Male



Dysfunction Possible
There may be improvement needed in certain areas.

SEX HORMONE FUNCTION

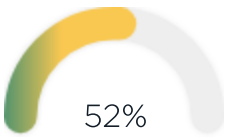
It is possible that your patient is in the early stages of sex hormone dysfunction, which is causing an increase in their Male Sex Hormone Function score. While this may not require immediate attention, you may want to keep an eye on this on future blood tests.

Rationale

Testosterone Free - Male ↓, Testosterone Total - Male ↓, Progesterone - Male ↓

Biomarkers considered

Estradiol - Male, Testosterone Free - Male, Testosterone Total - Male, PSA - Total, Progesterone - Male



Dysfunction Possible
There may be improvement needed in certain areas.

ADRENAL FUNCTION

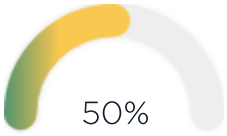
It is possible that your patient is in the early stages of adrenal stress or adrenal insufficiency, which is causing an increase in their Adrenal Function score.. While this may not require immediate attention, you may want to keep an eye on this on future blood tests.

Rationale

Sodium : Potassium ↓, Cholesterol - Total ↑, Triglycerides ↑, DHEA-S - Male ↓

Biomarkers considered

Sodium : Potassium, Sodium, Potassium, Cortisol - Total, Cortisol - PM, Glucose - Fasting, BUN, Chloride, CO2, Cholesterol - Total, Triglycerides, DHEA-S - Male



Dysfunction Possible
There may be improvement needed in certain areas.

IMMUNE FUNCTION

It is possible that your patient is in the early stages of immune dysfunction, which is causing an increase in their Immune Function score. While this may not require immediate attention, you may want to keep an eye on this on future blood tests.

Rationale

Total WBCs ↓, Monocytes - % ↑, Neutrophils - Absolute ↓, Alk Phos ↓

Biomarkers considered

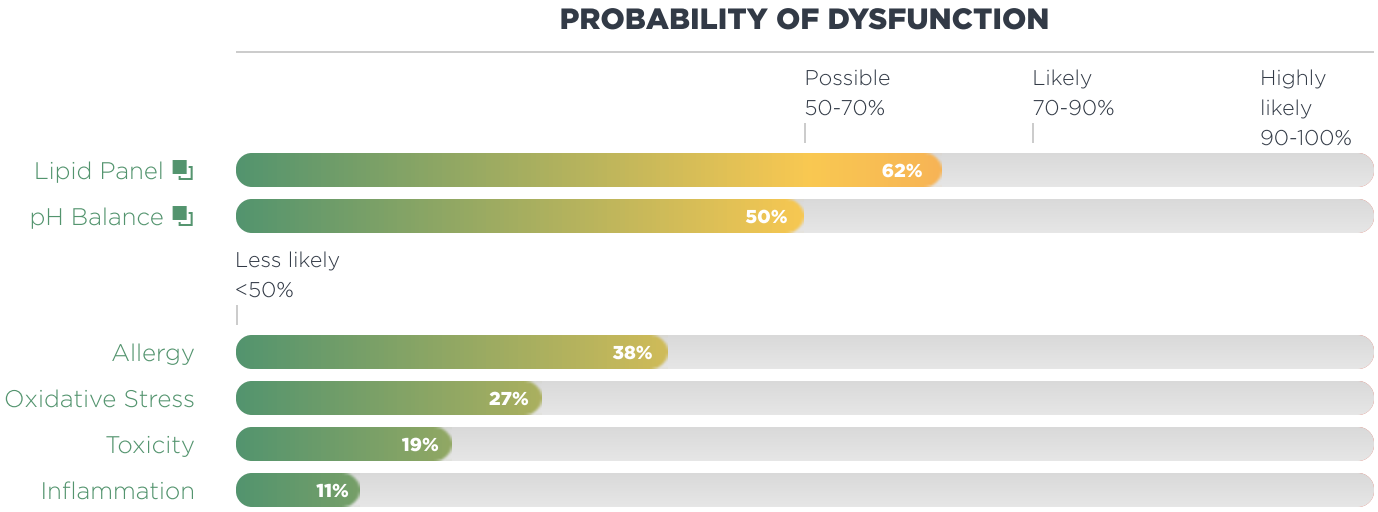
Total WBCs, Globulin - Total, Neutrophils - %, Lymphocytes - %, Monocytes - %, Monocytes - Absolute, Lymphocytes - Absolute, Neutrophils - Absolute, Albumin, Alk Phos, Ferritin

Accessory Systems

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

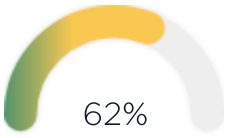
The Accessory Systems Report represents an algorithmic analysis of this blood test. These results have been converted into an individualized risk evaluation based on Optimal DX's latest research.

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 Possible. There may be improvement needed in certain areas.

LIPID PANEL

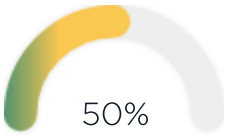
It is possible that your patient is in the early stages of hyperlipidemia, which is causing an increase in their Lipid Panel score. While this may not require immediate attention, you may want to keep an eye on this on future blood tests.

Rationale

Cholesterol - Total ↑, Triglycerides ↑, LDL Cholesterol ↑

Biomarkers considered

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



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

PH BALANCE

It is possible that your patient is starting to show signs of pH imbalance. The pH Balance score can help us pinpoint imbalances in the body's pH regulation. Your patient is trending towards imbalance. While this may not require immediate attention, you may want to keep an eye on this on future blood tests.

Rationale

Anion Gap ↑, Calcium ↓

Biomarkers considered

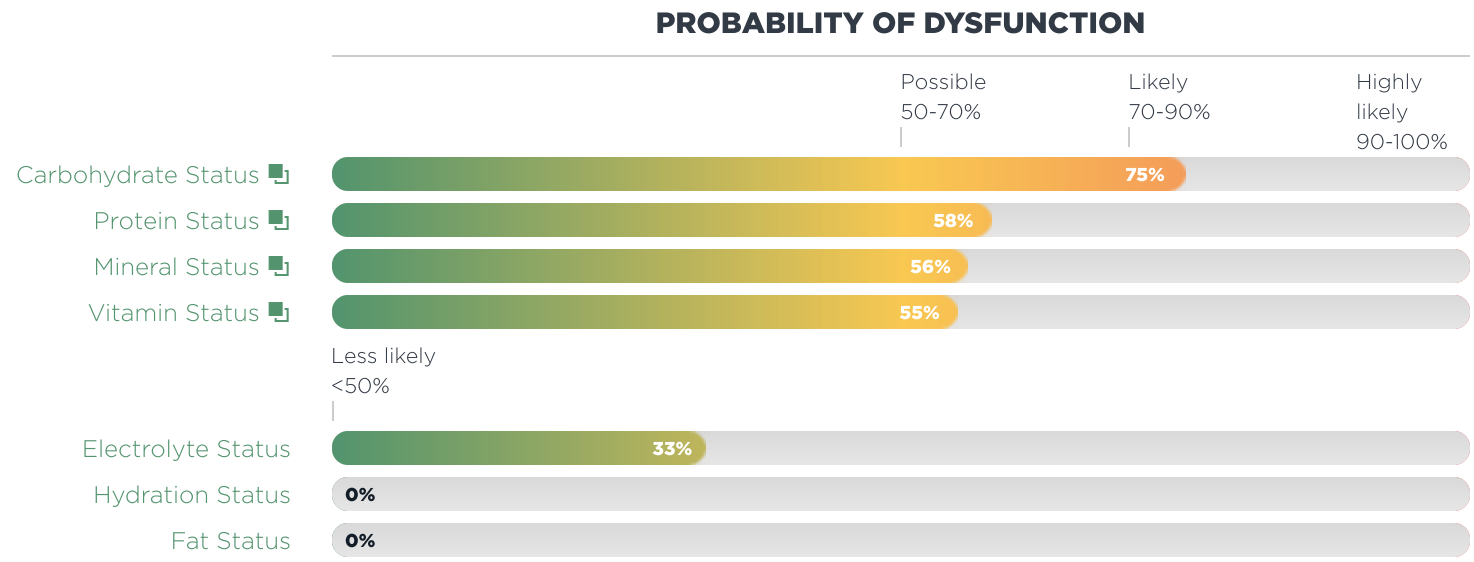
Anion Gap, Potassium, Chloride, CO2, Calcium

Nutrient Status

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

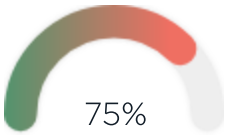
This report gives you an indication of your patient's general nutritional status. The Nutrient Status is influenced by actual dietary intake, digestion, absorption, assimilation, and cellular uptake of the nutrients themselves.

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 Likely. Improvement required.

CARBOHYDRATE STATUS

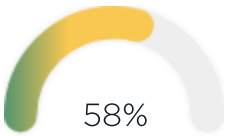
Your patient is likely having a hard time handling their dietary intake of carbohydrates, especially refined carbohydrates and sugars. A diet high in refined carbohydrates and sugars will deplete phosphorus stores and other important co-factors for carbohydrate metabolism. It may also increase serum glucose and serum triglyceride levels. There may need to be a further evaluation of their blood sugar regulation and a review of their diet to assess their daily intake of sugars and refined carbohydrates.

Rationale

Phosphorus ↓, LDH ↓, Cholesterol - Total ↑, LDL Cholesterol ↑, Total WBCs ↓

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.

PROTEIN STATUS

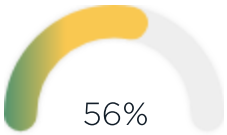
Your patient may be in the early stages of having difficulties with protein. This may be due to a diet that is low in protein and available amino acids or possibly digestive dysfunction, which can compromise protein digestion and absorption. While this may not require immediate attention, you may want to keep an eye on this on future blood tests.

Rationale

Protein - Total ↓, BUN ↓, Albumin ↓, Creatinine ↓, BUN : Creatinine ↓, Total WBCs ↓

Biomarkers considered

Protein - Total, BUN, Albumin, Calcium : Albumin, Creatinine, BUN : Creatinine, C-Reactive Protein, Hs CRP - Male, ALT, AST, CO2, GGT, Total WBCs, TIBC



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

MINERAL STATUS

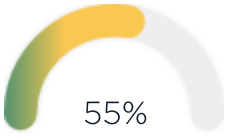
Your patient may be in the early stages of mineral deficiency or need, causing an increase in their Mineral Status score. While this may not require immediate attention, you may want to keep an eye on their mineral levels and keep monitoring this on future blood tests.

Rationale

Magnesium - Serum ↓, Zinc - Serum ↓, Calcium ↓, Phosphorus ↓, Alk Phos ↓, Iron - Serum ↓

Biomarkers considered

Magnesium - Serum, Copper - Serum, Zinc - Serum, Potassium, Uric Acid - Male, Calcium, Phosphorus, Alk Phos, GGT, Iron - Serum, Ferritin, TIBC, % Transferrin saturation, T3 - Total, T3 - Free, MCV



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

VITAMIN STATUS

Your patient may be in the early stages of vitamin deficiency or need, causing an increase in their Vitamin Status score. While this may not require immediate attention, you may want to keep an eye on their vitamin levels and keep monitoring this on future blood tests.

Rationale

Anion Gap ↑, Homocysteine ↑, MCV ↑, Methylmalonic Acid ↑, Folate - Serum ↓

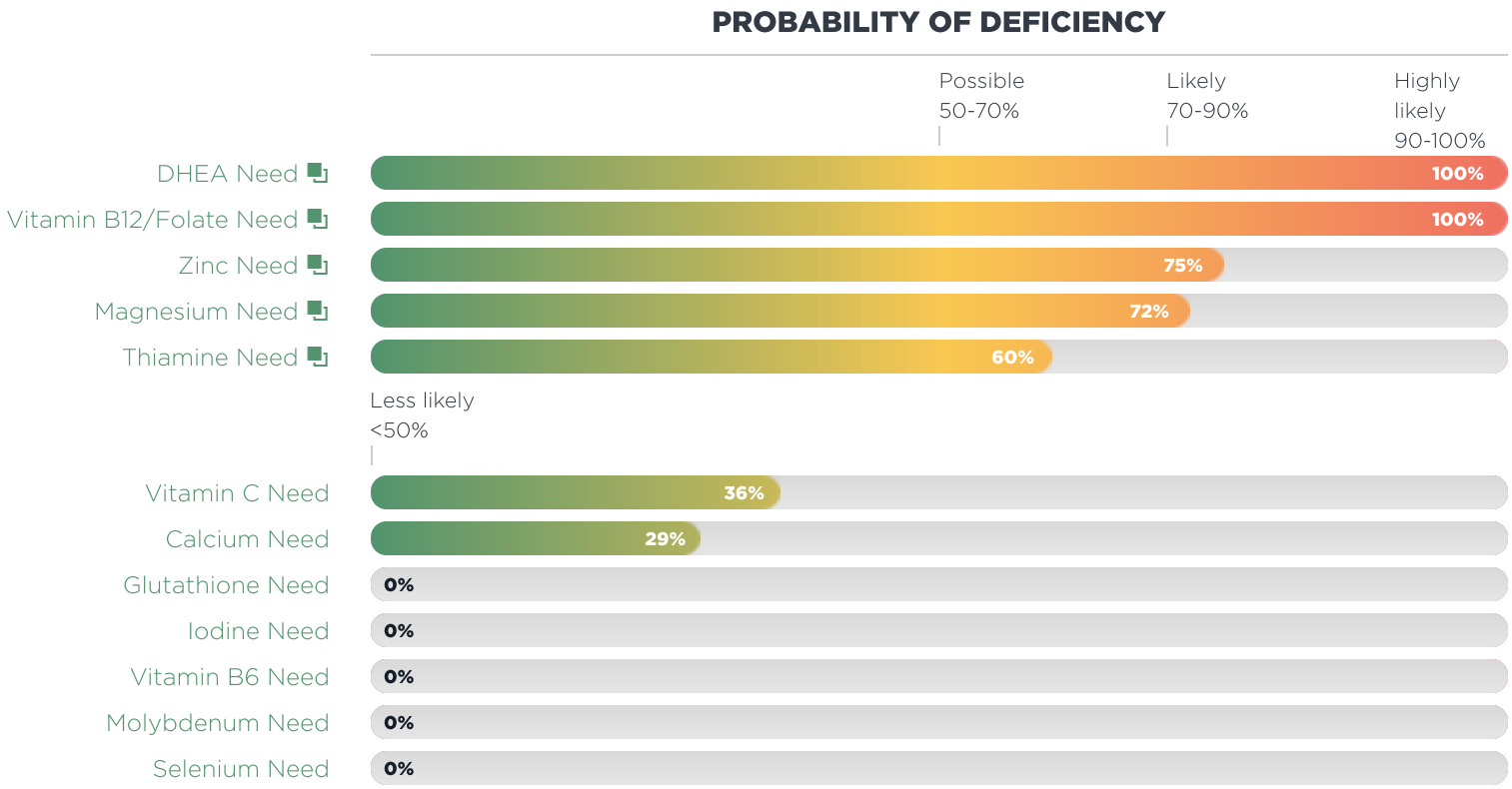
Biomarkers considered

Anion Gap, Albumin, AST, ALT, GGT, Homocysteine, Vitamin D (25-OH), MCV, Methylmalonic Acid, Folate - Serum, Vitamin B12

Individual Nutrient Deficiencies

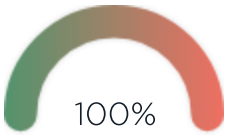
The values represent the degree of deficiency for individual nutrients based on your patient's blood results. The status of an individual nutrient is based on a number of factors such as actual dietary intake, digestion, absorption, assimilation and cellular uptake of the nutrients themselves. All of these factors must be taken into consideration before determining whether or not your patient actually needs 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 Highly Likely. Much improvement required.

DHEA NEED

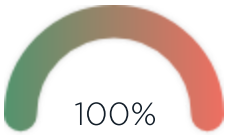
The results of this blood test indicate that this patient's DHEA levels might be lower than optimal.

Rationale

DHEA-S - Male ↓

Biomarkers considered

DHEA-S - Male



Deficiency Highly Likely. Much improvement required.

VITAMIN B12/FOLATE NEED

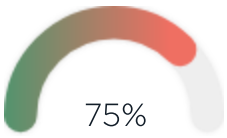
Consider a Vitamin B12 and folate need if the MCV is increased along with an increased MCH and an increased Methylmalonic Acid (MMA). If there is also an increased RDW, MCHC, and LDH (especially the LDH-1 isoenzyme fraction), and a decreased Uric Acid the probability of vitamin B-12/folate deficiency anemia is very high. Serum Vitamin B12 and serum Folate may also be decreased.

Rationale

Methylmalonic Acid ↑, MCV ↑, Homocysteine ↑, Total WBCs ↓, Folate - Serum ↓, Vitamin B12 ↓

Biomarkers considered

Methylmalonic Acid, MCV, LDH, Homocysteine, Uric Acid - Male, Albumin, Total WBCs, RBC - Male, Hemoglobin - Male, Hematocrit - Male, MCH, MCHC, RDW, Neutrophils - %, Folate - Serum, Vitamin B12



Deficiency Likely. Improvement required.

ZINC NEED

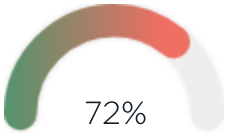
Consider a zinc need if the Serum Zinc levels are decreased along with a decreased Alk phos.

Rationale

Alk Phos ↓, Zinc - Serum ↓

Biomarkers considered

Alk Phos, Zinc - Serum



Deficiency Likely. Improvement required.

MAGNESIUM NEED

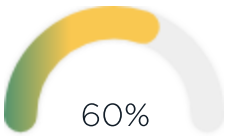
A magnesium need is associated with a decreased serum and/or RBC magnesium, and a decreased GGTP.

Rationale

Magnesium - Serum ↓, Magnesium - RBC ↓

Biomarkers considered

Magnesium - Serum, Magnesium - RBC, GGT



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

THIAMINE NEED

Consider Thiamine deficiency with an increased anion gap along with a decreased CO_2. Hemoglobin and hematocrit levels may be normal or decreased. Due to thiamine's role in glycolysis, LDH levels may be decreased and glucose levels may be normal to increased.

Rationale

Anion Gap ↑, Glucose - Fasting ↑, LDH ↓

Biomarkers considered

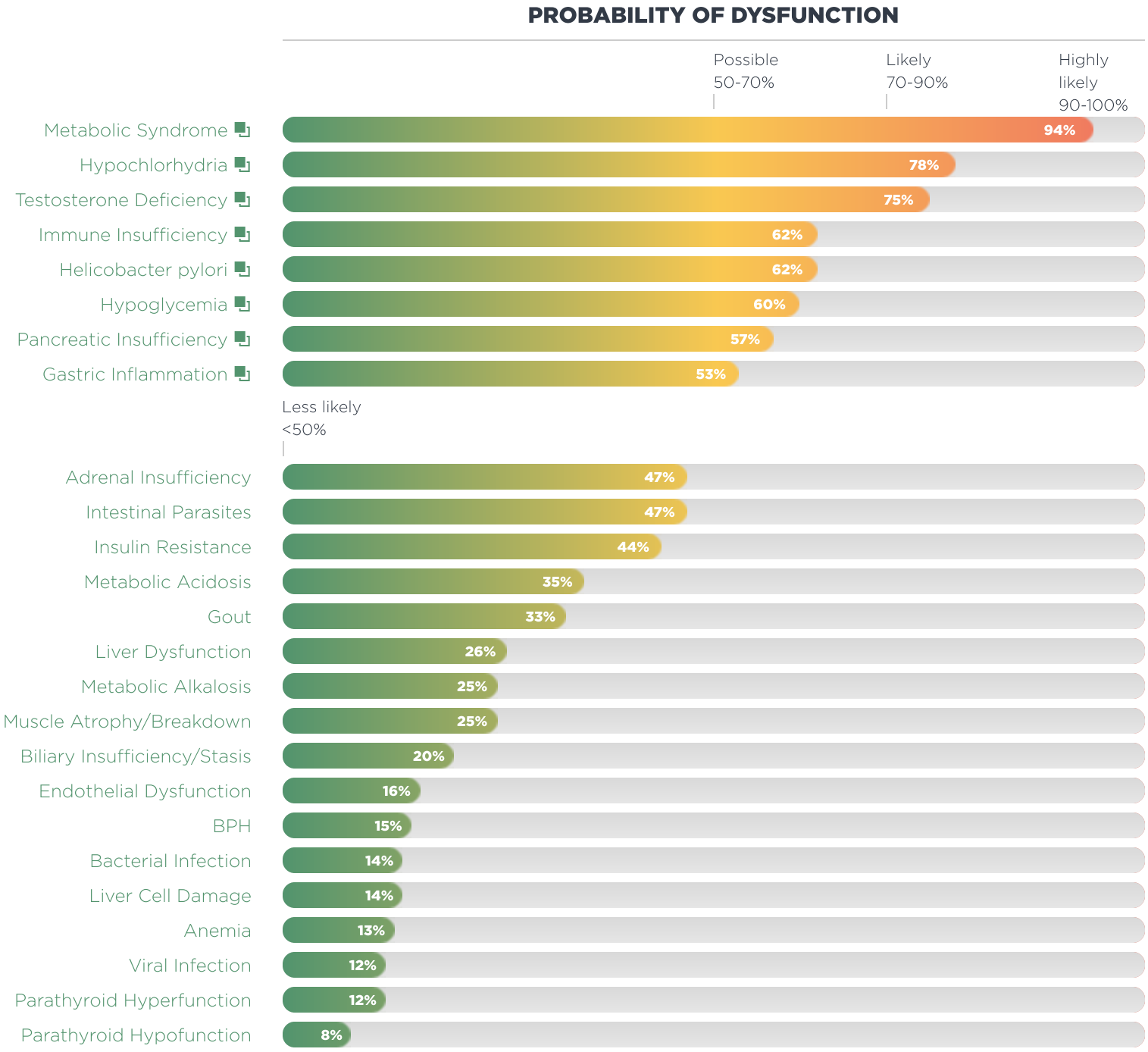
Anion Gap, CO2, Glucose - Fasting, LDH, Hemoglobin - Male, Hematocrit - Male

Clinical Dysfunctions

Advanced practitioner only report

The Clinical Dysfunctions Report shows a list of likely Health Concerns that your client may be suffering from based on an analysis of their Chemistry Screen and CBC results.

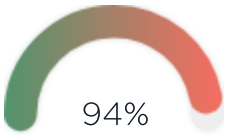
Each Clinical Dysfunction that has a probability of dysfunction above 50% is included in the section that follows so you can read a detailed description and individual explanation of the results shown in this report.




Anterior Pituitary Dysfunction
7%
Liver Cirrhosis
4%

Clinical Dysfunctions Details

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



Dysfunction Highly Likely. Much improvement required.

METABOLIC SYNDROME

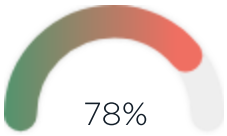
Consider metabolic syndrome with an increased triglyceride, an increased total cholesterol, an increased LDL cholesterol, a decreased HDL, an increased fasting blood glucose and an increased hemoglobin A1C. Additional elements that may be out of range with metabolic syndrome include an increased fasting insulin, an increased uric acid and decreased DHEA.

Rationale

Glucose - Fasting ↑, Triglycerides ↑, Insulin - Fasting ↑, Cholesterol - Total ↑, LDL Cholesterol ↑, DHEA-S - Male ↓

Biomarkers considered

Glucose - Fasting, Triglycerides, Hemoglobin A1C, Insulin - Fasting, Uric Acid - Male, Cholesterol - Total, LDL Cholesterol, HDL Cholesterol, DHEA-S - Male, Sex Hormone Binding Globulin - Male, Leptin - Male



Dysfunction Likely. Improvement required.

HYPOCHLORHYDRIA

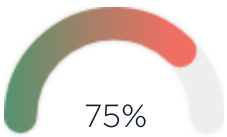
Consider hypochlorhydria with an increased total globulin level and a normal or decreased total protein and/or albumin, an increased BUN, a decreased serum phosphorous. Other values that may be reflective of a developing or chronic hypochlorhydria include an increased MCV and MCH, a decreased calcium and iron, a decreased chloride, an increased anion gap and a decreased alkaline phosphatase.

Rationale

Protein - Total ↓, Globulin - Total ↑, Albumin ↓, Phosphorus ↓, Alk Phos ↓, MCV ↑, Iron - Serum ↓, Anion Gap ↑, Calcium ↓, Gastrin ↓

Biomarkers considered

BUN, Protein - Total, Globulin - Total, Albumin, Phosphorus, Alk Phos, MCV, Iron - Serum, Anion Gap, Calcium, Gastrin



Dysfunction Likely. Improvement required.

TESTOSTERONE DEFICIENCY

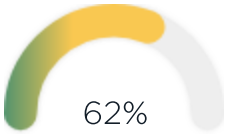
Consider a functional testosterone deficiency with a decreased total testosterone and a decreased free testosterone.

Rationale

Testosterone Total - Male ↓, Testosterone Free - Male ↓

Biomarkers considered

Testosterone Total - Male, Testosterone Free - Male



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

IMMUNE INSUFFICIENCY

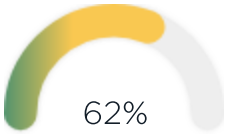
Consider an immune insufficiency with a decreased total WBC count along with a decreased albumin, a decreased total globulin, and a decreased alkaline phosphatase level.

Rationale

Total WBCs ↓, Albumin ↓, Alk Phos ↓

Biomarkers considered

Total WBCs, Albumin, Globulin - Total, Alk Phos



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

HELICOBACTER PYLORI

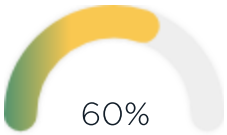
Helicobacter pylori infection is strongly associated with hypochlorhydria. Although there are no tests specifically for H. pylori on a blood chemistry screen you should suspect it if you see the the following pattern: an increased or decreased total globulin, an increased or decreased total protein, an increased or decreased BUN, a decreased serum phosphorous, an Increased WBC count, an increased neutrophil count, a decreased lymphocyte count, and a normal or increased monocyte count. If you see a high score for H. pylori consider doing further testing.

Rationale

BUN ↓, Protein - Total ↓, Globulin - Total ↑, Phosphorus ↓, Monocytes - % ↑

Biomarkers considered

BUN, Protein - Total, Globulin - Total, Phosphorus, Total WBCs, Neutrophils - %, Lymphocytes - %, Monocytes - %



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

HYPOGLYCEMIA

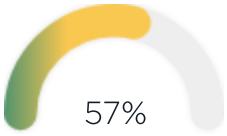
Consider hypoglycemia with a decreased fasting blood glucose along with a decreased LDH. Additional elements that may be out of range with hypoglycemia include a decreased Hemoglobin A1C and an increased SGPT/ALT level.

Rationale

LDH ↓

Biomarkers considered

Glucose - Fasting, LDH, Hemoglobin A1C



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

PANCREATIC INSUFFICIENCY

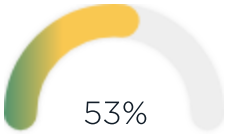
Consider pancreatic insufficiency with a decreased WBC count, a decreased BUN, a decreased albumin, and an increased globulin and an increased GGTP. One of the most significant contributing factors to pancreatic insufficiency is an accompanying hypochlorhydria picture.

Rationale

Gastrin ↓, BUN ↓, Globulin - Total ↑, Total WBCs ↓

Biomarkers considered

Gastrin, Amylase, BUN, Albumin, Globulin - Total, GGT, Total WBCs



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

GASTRIC INFLAMMATION

Gastric inflammation or gastritis is often secondary to hypochlorhydria where the pattern is similar but the total globulin level may be decreased unless inflammation is severe, which may lead to an increased globulin level due to the increased production of inflammatory immunoglobulins. Consider gastric inflammation or gastritis with a decreased total globulin, a decreased serum protein, a decreased phosphorous, a decreased hemoglobin and an increased BUN. Additional elements that may be out of range with gastric inflammation include an increased basophil count, an increased ESR, a decreased albumin and a decreased creatinine.

Rationale

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

Biomarkers considered

Globulin - Total, Protein - Total, Hemoglobin - Male, BUN, Creatinine, Albumin, Phosphorus, ESR - Male, Basophils - %, Gastrin

3

A full breakdown of all the individual biomarker results, showing you if a particular biomarker is outside of the optimal range or outside of the clinical lab range plus a comparative and historical view.

Analytics

Blood Test Results

The Blood Test Results Report lists the results of your patient's 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	3	29	69	14	6	0	121

BLOOD GLUCOSE

Glucose - Fasting
89.71 mg/dL

Low	Below Optimal	Optimal	**Above Optimal**	High
< 65.00	65.00 - 75.00	75.00 - 86.00	86.00 - 99.00	> 99.00

Hemoglobin A1C
5.2 %

Below Optimal	**Optimal**	Above Optimal	High
< 4.60	4.60 - 5.30	5.30 - 5.70	> 5.70

eAG
102.68 mg/dl

Low	Below Optimal	**Optimal**	Above Optimal	High
< 82.00	82.00 - 85.00	85.00 - 105.00	105.00 - 154.00	> 154.00

Insulin - Fasting
5.19 µIU/ml

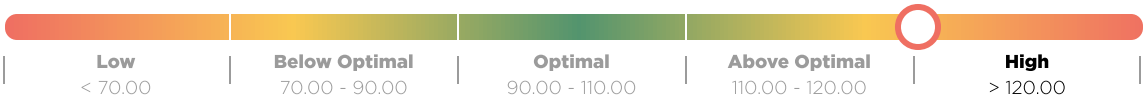
Below Optimal	Optimal	**Above Optimal**	High
< 2.00	2.00 - 5.00	5.00 - 19.60	> 19.60

C-Peptide
2.04 ng/ml

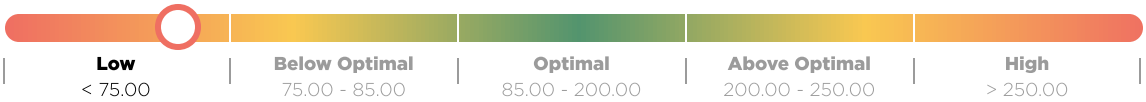
Low	Below Optimal	**Optimal**	Above Optimal	High
< 0.80	0.80 - 1.10	1.10 - 2.10	2.10 - 3.85	> 3.85

Fructosamine
193.7 µmol/L

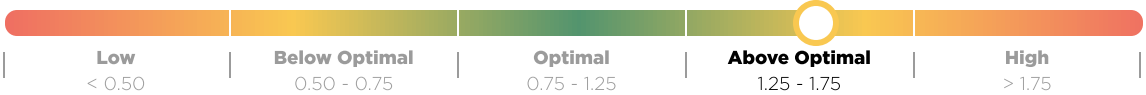
HOMA2-%B
128.2 %



HOMA2-%S
65 %



HOMA2-IR
1.53 Index

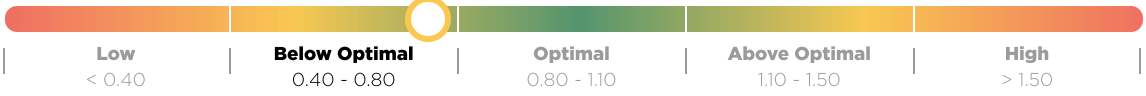


QUICKI
0.37 Index

RENAL

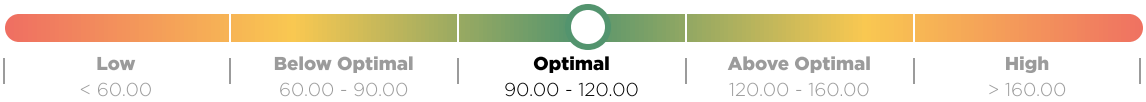
BUN
8.96 mg/dL

Creatinine
0.76 mg/dL



BUN : Creatinine
7.43 Ratio

eGFR
107 mL/min/1.73m2



PROSTATE

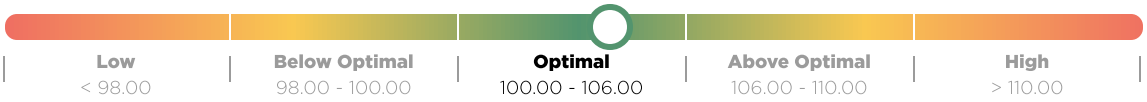
PSA - Total
0.4 ng/ml

ELECTROLYTES

Sodium
139 mEq/L

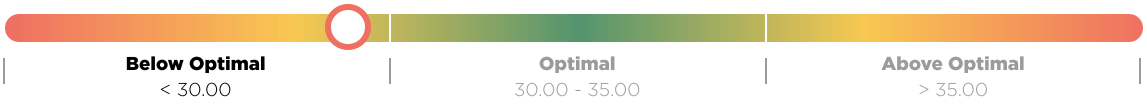
Potassium
4.7 mEq/L

Chloride
104 mEq/L



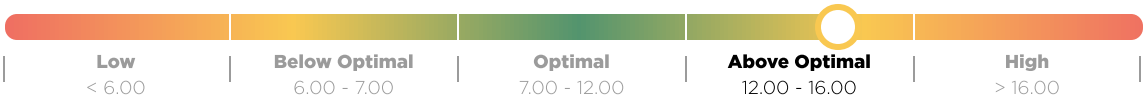
CO2
25 mEq/L

Sodium : Potassium
29.57 ratio

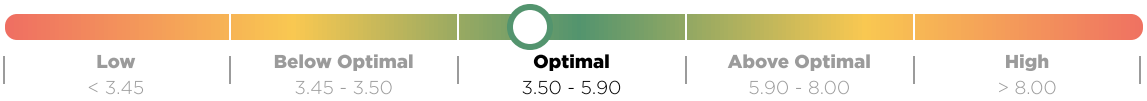


METABOLIC

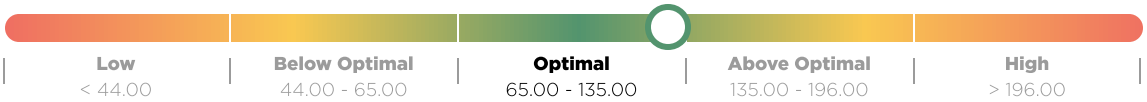
Anion Gap
14.7 mEq/L



Uric Acid - Male
4.29 mg/dL



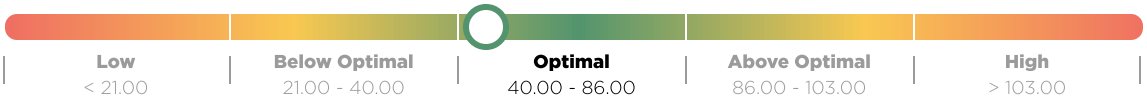
Creatine Kinase
129.34 u/l



Leptin - Male
4.5 ng/ml

ENZYMES

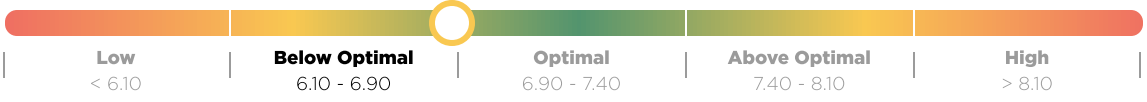
Amylase
45 U/L



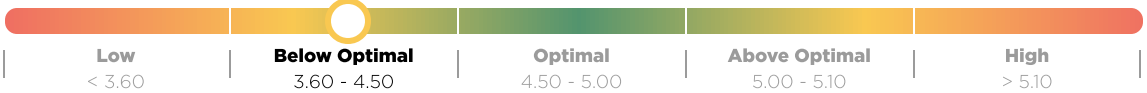
Lipase
43 U/L

PROTEINS

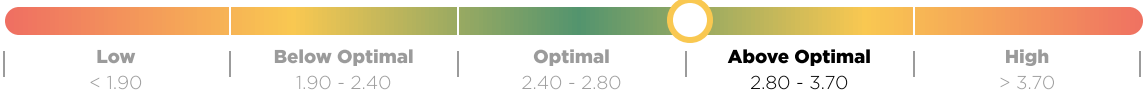
Protein - Total
6.86 g/dL



Albumin
4.05 g/dL



Globulin - Total
2.81 g/dL

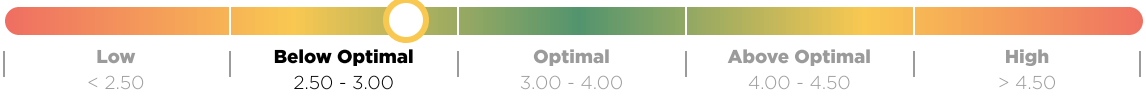


Albumin : Globulin
1.44 ratio

MINERALS

Calcium
9.12 mg/dL

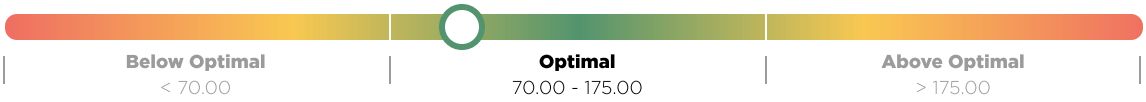
Phosphorus
2.88 mg/dL



Magnesium - Serum
2.05 mg/dl

Magnesium - RBC
5.77 mg/dl

Copper - Serum
89.11 µg/dL



Zinc - Serum
76.13 ug/dL

Zinc - RBC
9.09 mg/L

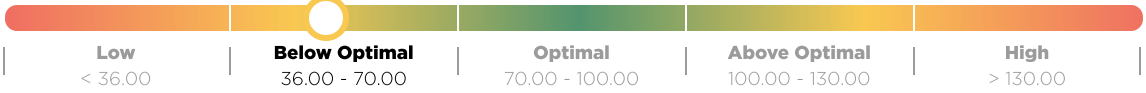
Copper : Zinc Ratio
1.17 Ratio

Calcium : Albumin
2 ratio

Calcium : Phosphorus
3.10 ratio

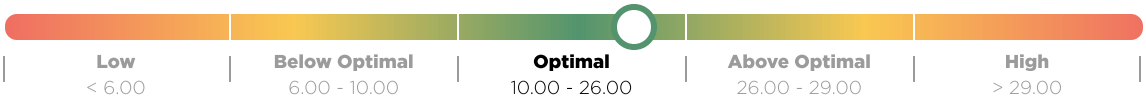
LIVER AND GB

Alk Phos
51 IU/L



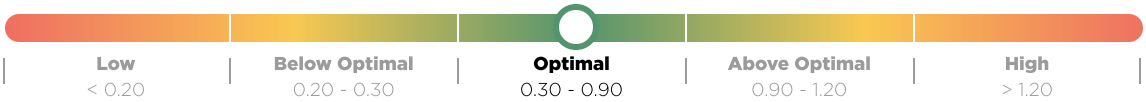
AST
12 IU/L

ALT
22 IU/L

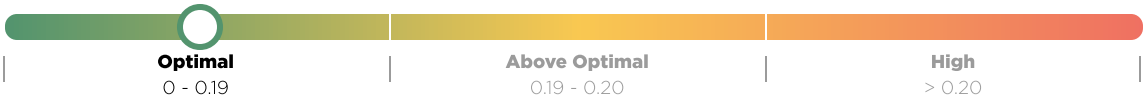


LDH
131 IU/L

Bilirubin - Total
0.6 mg/dL



Bilirubin - Direct
0.1 mg/dL



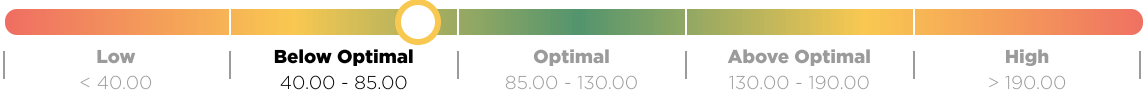
Bilirubin - Indirect
0.5 mg/dL

GGT
17 IU/L

AST : ALT
0.55 Ratio

IRON MARKERS

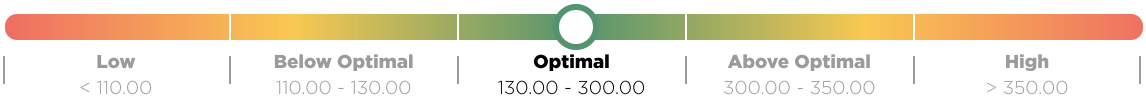
Iron - Serum
77.93 µg/dL



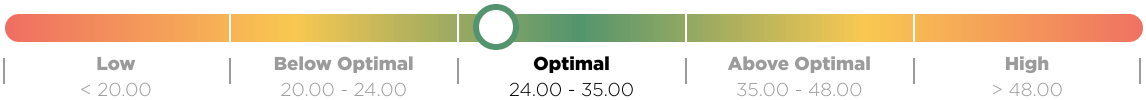
Ferritin
41 ng/mL

TIBC
300 µg/dL

UIBC
221.94 µg/dL

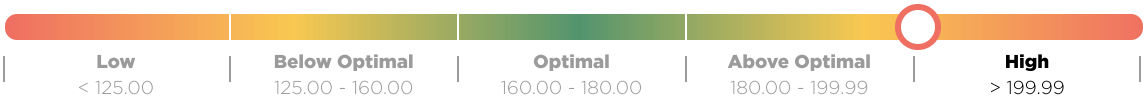


% Transferrin saturation
26 %



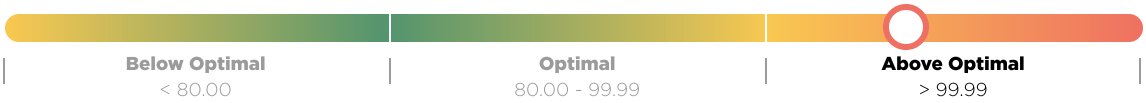
LIPIDS

Cholesterol - Total
202.24 mg/dL

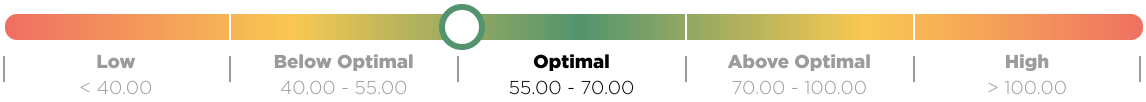


Triglycerides
94.77 mg/dL

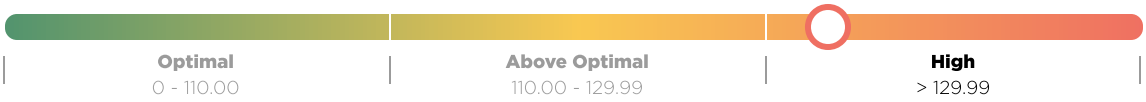
LDL Cholesterol
121.42 mg/dL



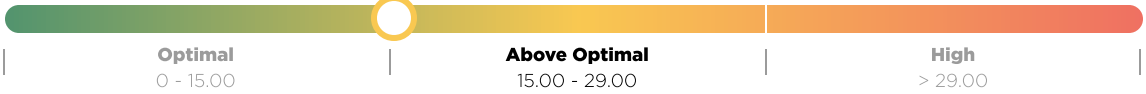
HDL Cholesterol
55.30 mg/dL



Non-HDL Cholesterol
146.33 mg/dl



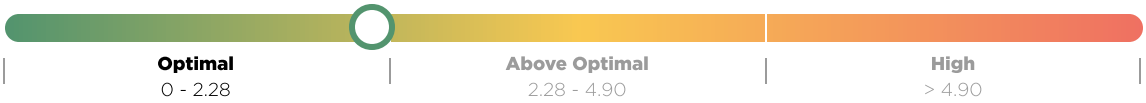
VLDL Cholesterol
15.08 mg/dl



Cholesterol : HDL
3.62 Ratio

Triglyceride:HDL
1.67 ratio

LDL : HDL - Male
2.18 Ratio

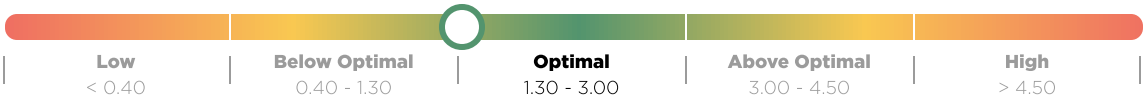


CARDIOMETABOLIC

Homocysteine
7.3 µmol/L

THYROID

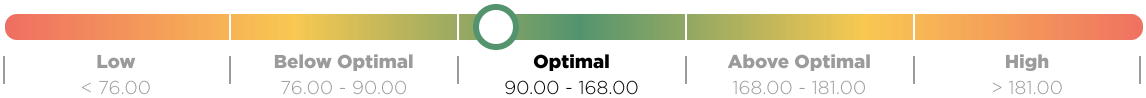
TSH
1.31 µU/mL



T4 - Total
8.29 µg/dL

T4 - Free
1.29 ng/dL

T3 - Total
101.95 ng/dL



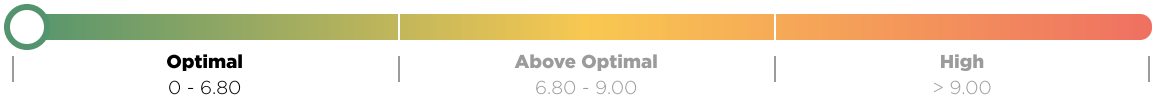
T3 - Free
3.29 pg/ml

Reverse T3
12.34 ng/dl

T3 Uptake
31 %

Free Thyroxine Index (T7)
2.6 Index

Thyroid Peroxidase (TPO) Abs
0.2 IU/ml



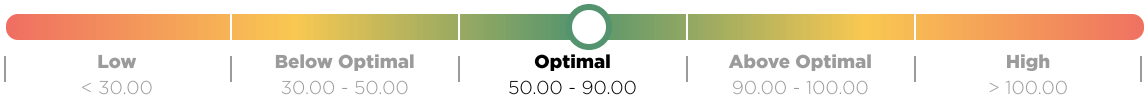
Thyroglobulin Abs
<1 IU/ml

Free T3 : Reverse T3
25.38 Ratio

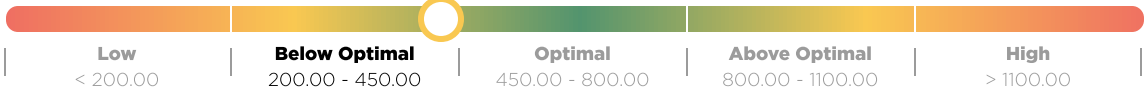
Free T3 : Free T4
2.54 Ratio

VITAMINS

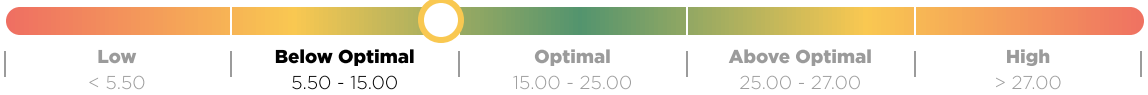
Vitamin D (25-OH)
73.99 ng/ml



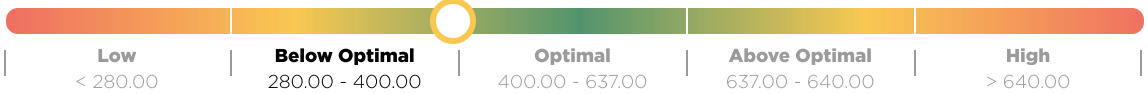
Vitamin B12
426.99 pg/ml



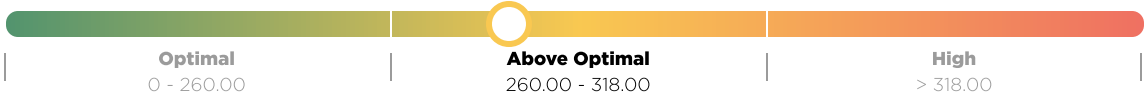
Folate - Serum
14.19 ng/ml



Folate - RBC
398.09 ng/ml



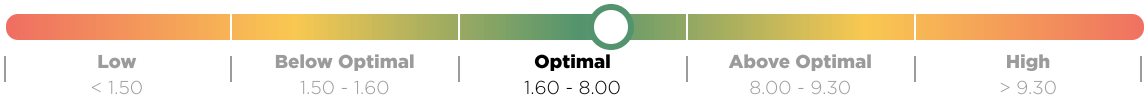
Methylmalonic Acid
278.2 nmol/L



HORMONES

DHEA-S - Male
74.43 µg/dL

FSH - Male
5.9 mIU/ml

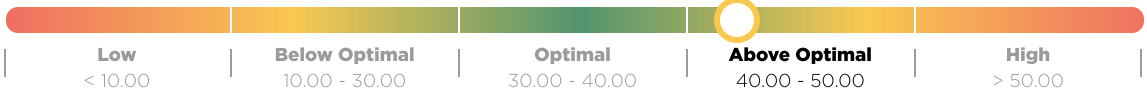


LH - Male
4.3 mIU/ml

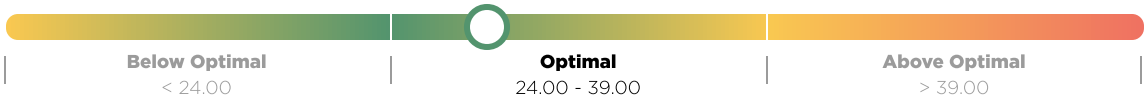
Testosterone Total - Male
649.55 ng/dl

Testosterone Free - Male
127.43 pg/ml

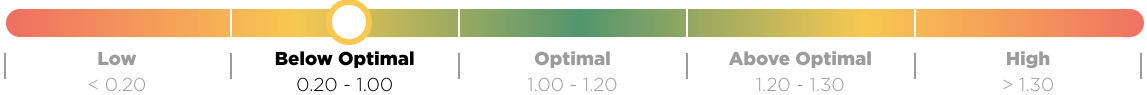
Sex Hormone Binding Globulin - Male
42 nmol/L



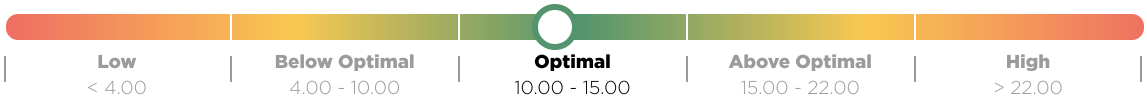
Estradiol - Male
27.99 pg/ml



Progesterone - Male
0.64 ng/ml



Cortisol - Total
12.19 µg/dL



Cortisol : DHEA-S
0.16 ratio

Cortisol - PM
7.79 µg/dL

Gastrin
42.47 pg/ml

Testosterone Bioavailable - Male
280.93 ng/dl

% Testosterone Bioavailable - Male
43.27 %

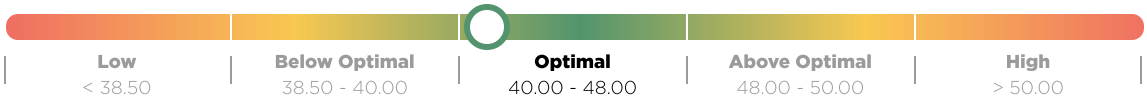
% Testosterone Free - Male
1.96 %

CBC/HEMATOLOGY

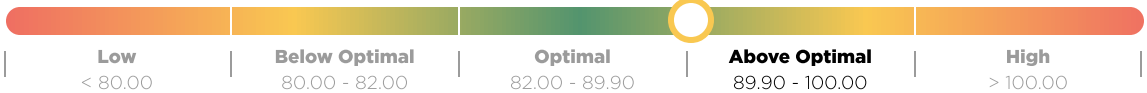
RBC - Male
4.6 m/cumm

Hemoglobin - Male
14.2 g/dl

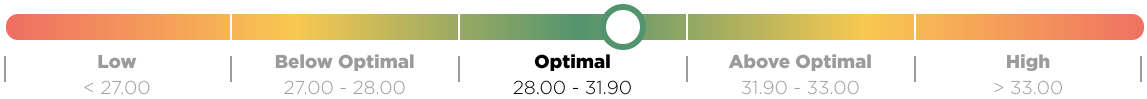
Hematocrit - Male
41 %



MCV
90.4 fL

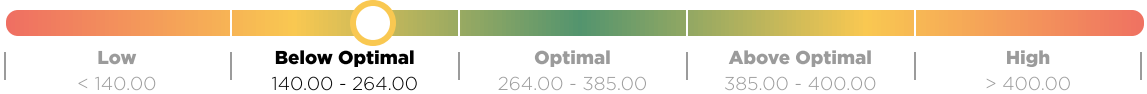


MCH
30.9 pg



MCHC
34.1 g/dL

Platelets
217 10E3/µL

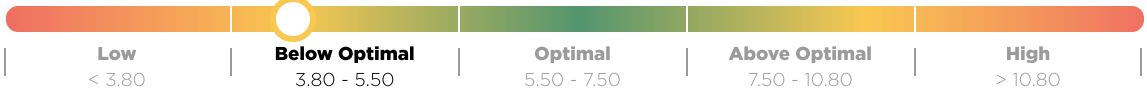


MPV
11.2 fL

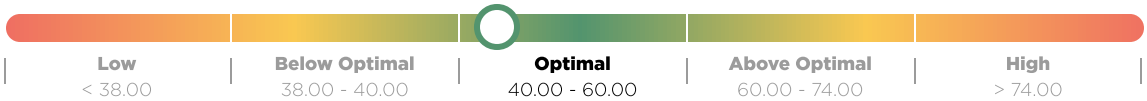
RDW
12.4 %

WHITE BLOOD CELLS

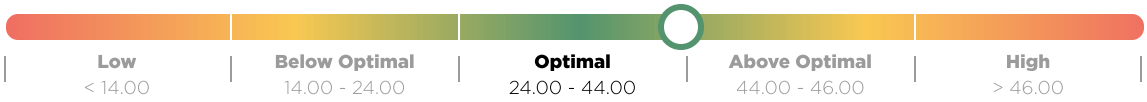
Total WBCs
4.3 k/cumm



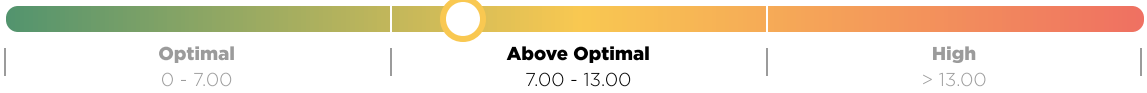
Neutrophils - %
43.4 %



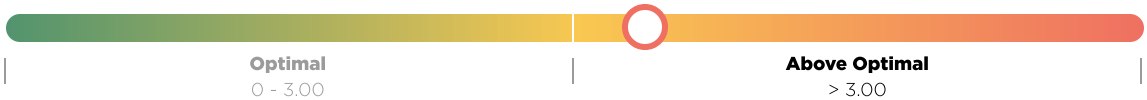
Lymphocytes - %
43 %



Monocytes - %
8.2 %

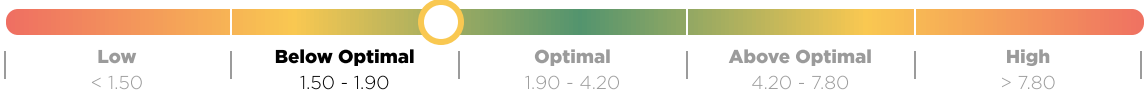


Eosinophils - %
4.5 %



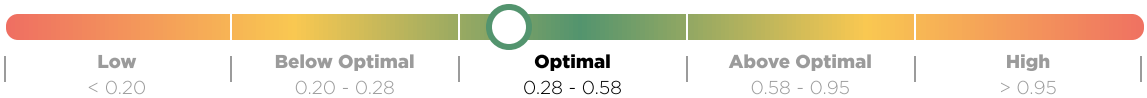
Basophils - %
0.9 %

Neutrophils - Absolute
1.87 k/cumm

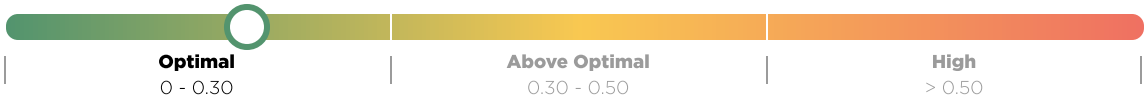


Lymphocytes - Absolute
1.85 k/cumm

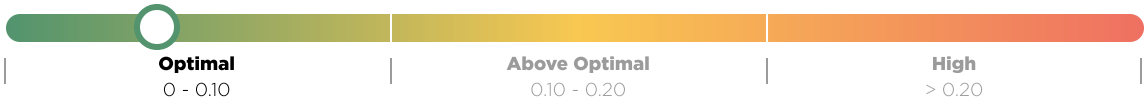
Monocytes - Absolute
0.35 k/cumm



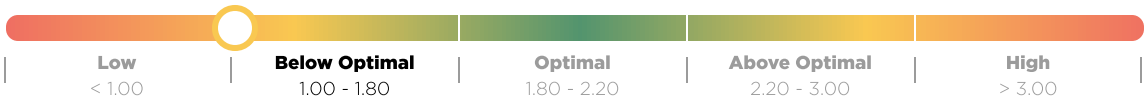
Eosinophils - Absolute
0.19 k/cumm



Basophils - Absolute
0.04 k/cumm

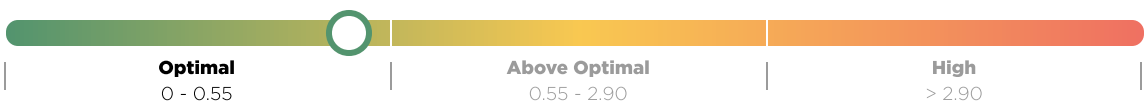


Neutrophil : Lymphocyte
1.01 Ratio



INFLAMMATION

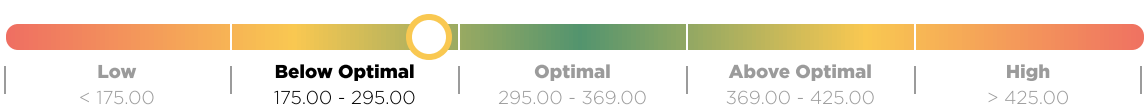
Hs CRP - Male
0.49 mg/L



C-Reactive Protein
4.09 mg/L

ESR - Male
4.8 mm/hr

Fibrinogen
282.65 mg/dl



Blood Test Results Comparative

The Blood Test Results Comparative Report lists the results of your patient's latest and previous 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.

Comparative total number of biomarkers by optimal range

	Alarm Low	Low	Below Optimal	Optimal	Above Optimal	High	Alarm High
Current	0	3	29	69	14	6	0
Previous	0	0	0	0	0	0	0

Biomarker	Quest Current Jan 29 2023	Optimal range	Standard range	Units
Glucose - Fasting	89.71 ↑	75.00 - 86.00	65.00 - 99.00	mg/dL
Hemoglobin A1C	5.2	4.60 - 5.30	0 - 5.70	%
eAG	102.68	85.00 - 105.00	82.00 - 154.00	mg/dl
Insulin - Fasting	5.19 ↑	2.00 - 5.00	0 - 19.60	µIU/ml
C-Peptide	2.04	1.10 - 2.10	0.80 - 3.85	ng/ml
Fructosamine	193.7	190.00 - 228.00	190.00 - 270.00	µmol/L
HOMA2-%B	128.2 ↑ ↑	90.00 - 110.00	70.00 - 120.00	%
HOMA2-%S	65 ↓ ↓	85.00 - 200.00	75.00 - 250.00	%
HOMA2-IR	1.53 ↑	0.75 - 1.25	0.50 - 1.75	Index
QUICKI	0.37 ↓	0.45 - 5.00	0.34 - 5.00	Index
BUN	8.96 ↓	10.00 - 16.00	7.00 - 25.00	mg/dL
Creatinine	0.76 ↓	0.80 - 1.10	0.40 - 1.50	mg/dL
BUN : Creatinine	7.43 ↓	10.00 - 16.00	6.00 - 22.00	Ratio
eGFR	107	90.00 - 120.00	60.00 - 160.00	mL/min/1.73m2
PSA - Total	0.4	0 - 2.50	0 - 4.00	ng/ml
Sodium	139	135.00 - 142.00	135.00 - 146.00	mEq/L
Potassium	4.7	4.00 - 5.00	3.50 - 5.30	mEq/L

Biomarker	Quest Current Jan 29 2023	Optimal range	Standard range	Units
Chloride	104	100.00 - 106.00	98.00 - 110.00	mEq/L
CO2	25	25.00 - 30.00	19.00 - 30.00	mEq/L
Sodium : Potassium	29.57 ↓ ↓	30.00 - 35.00	30.00 - 35.00	ratio
Anion Gap	14.7 ↑	7.00 - 12.00	6.00 - 16.00	mEq/L
Uric Acid - Male	4.29	3.50 - 5.90	3.45 - 8.00	mg/dL
Creatine Kinase	129.34	65.00 - 135.00	44.00 - 196.00	u/l
Leptin - Male	4.5	1.20 - 9.50	0.30 - 13.40	ng/ml
Amylase	45	40.00 - 86.00	21.00 - 103.00	U/L
Lipase	43	22.00 - 51.00	13.00 - 60.00	U/L
Protein - Total	6.86 ↓	6.90 - 7.40	6.10 - 8.10	g/dL
Albumin	4.05 ↓	4.50 - 5.00	3.60 - 5.10	g/dL
Globulin - Total	2.81 ↑	2.40 - 2.80	1.90 - 3.70	g/dL
Albumin : Globulin	1.44	1.40 - 2.10	1.00 - 2.50	ratio
Calcium	9.12 ↓	9.20 - 10.00	8.60 - 10.40	mg/dL
Phosphorus	2.88 ↓	3.00 - 4.00	2.50 - 4.50	mg/dL
Magnesium - Serum	2.05 ↓	2.20 - 2.50	1.50 - 2.50	mg/dl
Magnesium - RBC	5.77 ↓	6.00 - 6.80	4.00 - 6.80	mg/dl
Copper - Serum	89.11	70.00 - 175.00	70.00 - 175.00	µg/dL
Zinc - Serum	76.13 ↓	80.00 - 100.00	50.00 - 130.00	ug/dL
Zinc - RBC	9.09 ↓	10.40 - 14.70	9.00 - 14.70	mg/L
Copper : Zinc Ratio	1.17	0.70 - 1.50	0.80 - 2.00	Ratio
Calcium : Albumin	2	0 - 2.60	0 - 2.60	ratio
Calcium : Phosphorus	3.10	2.30 - 3.20	1.90 - 4.20	ratio
Alk Phos	51 ↓	70.00 - 100.00	36.00 - 130.00	IU/L
AST	12	10.00 - 26.00	10.00 - 35.00	IU/L
ALT	22	10.00 - 26.00	6.00 - 29.00	IU/L
LDH	131 ↓	140.00 - 200.00	100.00 - 200.00	IU/L
Bilirubin - Total	0.6	0.30 - 0.90	0.20 - 1.20	mg/dL
Bilirubin - Direct	0.1	0 - 0.19	0 - 0.20	mg/dL
Bilirubin - Indirect	0.5	0.10 - 0.70	0.20 - 1.20	mg/dL
GGT	17	10.00 - 17.00	3.00 - 90.00	IU/L
AST : ALT	0.55	0 - 1.00	0 - 1.00	Ratio
Iron - Serum	77.93 ↓	85.00 - 130.00	40.00 - 190.00	µg/dL
Ferritin	41	30.00 - 70.00	38.00 - 380.00	ng/mL
TIBC	300	250.00 - 350.00	250.00 - 425.00	µg/dL
UIBC	221.94	130.00 - 300.00	110.00 - 350.00	µg/dL
% Transferrin saturation	26	24.00 - 35.00	20.00 - 48.00	%
Cholesterol - Total	202.24 ↑ ↑	160.00 - 180.00	125.00 - 199.99	mg/dL
Triglycerides	94.77 ↑	70.00 - 80.00	0 - 149.99	mg/dL
LDL Cholesterol	121.42 ↑ ↑	80.00 - 99.99	0 - 99.99	mg/dL
HDL Cholesterol	55.30	55.00 - 70.00	40.00 - 100.00	mg/dL
Non-HDL Cholesterol	146.33 ↑ ↑	0 - 110.00	0 - 129.99	mg/dl
VLDL Cholesterol	15.08 ↑	0 - 15.00	0 - 29.00	mg/dl

Biomarker	Quest Current Jan 29 2023	Optimal range	Standard range	Units
Cholesterol : HDL	3.62 ↑	0 - 3.00	0 - 5.00	Ratio
Triglyceride:HDL	1.67	0.50 - 1.90	0 - 2.00	ratio
LDL : HDL - Male	2.18	0 - 2.28	0 - 4.90	Ratio
Homocysteine	7.3 ↑	5.00 - 7.20	0 - 10.30	µmol/L
TSH	1.31	1.30 - 3.00	0.40 - 4.50	µU/mL
T4 - Total	8.29	6.00 - 11.90	4.50 - 12.00	µg/dL
T4 - Free	1.29	1.00 - 1.50	0.80 - 1.80	ng/dL
T3 - Total	101.95	90.00 - 168.00	76.00 - 181.00	ng/dL
T3 - Free	3.29	3.00 - 3.50	2.30 - 4.20	pg/ml
Reverse T3	12.34	10.00 - 25.00	8.00 - 25.00	ng/dl
T3 Uptake	31	27.00 - 35.00	22.00 - 35.00	%
Free Thyroxine Index (T7)	2.6	1.70 - 4.60	1.40 - 3.80	Index
Thyroid Peroxidase (TPO) Abs	0.2	0 - 6.80	0 - 9.00	IU/ml
Thyroglobulin Abs	<1	0 - 1.00	0 - 1.00	IU/ml
Free T3 : Reverse T3	25.38	10.00 - 50.00	2.00 - 50.00	Ratio
Free T3 : Free T4	2.54	2.40 - 2.70	2.20 - 2.90	Ratio
Vitamin D (25-OH)	73.99	50.00 - 90.00	30.00 - 100.00	ng/ml
Vitamin B12	426.99 ↓	450.00 - 800.00	200.00 - 1100.00	pg/ml
Folate - Serum	14.19 ↓	15.00 - 25.00	5.50 - 27.00	ng/ml
Folate - RBC	398.09 ↓	400.00 - 637.00	280.00 - 640.00	ng/ml
Methylmalonic Acid	278.2 ↑	0 - 260.00	0 - 318.00	nmol/L
DHEA-S - Male	74.43 ↓ ↓	350.00 - 690.00	85.00 - 690.00	µg/dL
FSH - Male	5.9	1.60 - 8.00	1.50 - 9.30	mIU/ml
LH - Male	4.3	1.50 - 9.30	1.50 - 9.30	mIU/ml
Testosterone Total - Male	649.55 ↓	700.00 - 1100.00	250.00 - 1100.00	ng/dl
Testosterone Free - Male	127.43 ↓	150.00 - 224.00	46.00 - 224.00	pg/ml
Sex Hormone Binding Globulin - Male	42 ↑	30.00 - 40.00	10.00 - 50.00	nmol/L
Estradiol - Male	27.99	24.00 - 39.00	0 - 39.00	pg/ml
Progesterone - Male	0.64 ↓	1.00 - 1.20	0.20 - 1.30	ng/ml
Cortisol - Total	12.19	10.00 - 15.00	4.00 - 22.00	µg/dL
Cortisol : DHEA-S	0.16 ↑ ↑	0 - 0.09	0 - 0.09	ratio
Cortisol - PM	7.79	6.00 - 10.00	3.00 - 17.00	µg/dL
Gastrin	42.47 ↓	45.00 - 90.00	0 - 100.00	pg/ml
Testosterone Bioavailable - Male	280.93 ↓	375.00 - 575.00	110.00 - 575.00	ng/dl
% Testosterone Bioavailable - Male	43.27 ↓	53.00 - 65.00	35.00 - 65.00	%
% Testosterone Free - Male	1.96	1.60 - 2.20	1.00 - 2.90	%
RBC - Male	4.6	4.20 - 4.90	4.20 - 5.80	m/cumm
Hemoglobin - Male	14.2	14.00 - 15.00	13.20 - 17.10	g/dl
Hematocrit - Male	41	40.00 - 48.00	38.50 - 50.00	%
MCV	90.4 ↑	82.00 - 89.90	80.00 - 100.00	fL
MCH	30.9	28.00 - 31.90	27.00 - 33.00	pg
MCHC	34.1	34.00 - 36.00	32.00 - 36.00	g/dL
Platelets	217 ↓	264.00 - 385.00	140.00 - 400.00	10E3/µL

Biomarker	Quest			
	Current Jan 29 2023	Optimal range	Standard range	Units
MPV	11.2 ↑	7.50 - 8.20	7.50 - 11.50	fL
RDW	12.4	11.00 - 12.60	11.00 - 15.00	%
Total WBCs	4.3 ↓	5.50 - 7.50	3.80 - 10.80	k/cumm
Neutrophils - %	43.4	40.00 - 60.00	38.00 - 74.00	%
Lymphocytes - %	43	24.00 - 44.00	14.00 - 46.00	%
Monocytes - %	8.2 ↑	0 - 7.00	4.00 - 13.00	%
Eosinophils - %	4.5 ↑ ↑	0 - 3.00	0 - 3.00	%
Basophils - %	0.9	0 - 1.00	0 - 1.00	%
Neutrophils - Absolute	1.87 ↓	1.90 - 4.20	1.50 - 7.80	k/cumm
Lymphocytes - Absolute	1.85	0.95 - 3.10	0.85 - 3.90	k/cumm
Monocytes - Absolute	0.35	0.28 - 0.58	0.20 - 0.95	k/cumm
Eosinophils - Absolute	0.19	0 - 0.30	0 - 0.50	k/cumm
Basophils - Absolute	0.04	0 - 0.10	0 - 0.20	k/cumm
Neutrophil : Lymphocyte	1.01 ↓	1.80 - 2.20	1.00 - 3.00	Ratio
Hs CRP - Male	0.49	0 - 0.55	0 - 2.90	mg/L
C-Reactive Protein	4.09	0 - 4.50	0 - 7.90	mg/L
ESR - Male	4.8	0 - 5.00	0 - 15.00	mm/hr
Fibrinogen	282.65 ↓	295.00 - 369.00	175.00 - 425.00	mg/dl

Blood Test Score Report

This report shows the biomarkers on the blood test that are farthest from the median expressed as a %.

The biomarkers that appear closest to the top and the bottom are those biomarkers that are farthest from the median and should be carefully reviewed.

Biomarker	Lab result	Optimal range		% deviation	Optimal range
		Low	High		Low High
MPV	11.2	7.50	8.20	479	
Triglycerides	94.77	70.00	80.00	198	
Cholesterol - Total	202.24	160.00	180.00	161	
LDL Cholesterol	121.42	80.00	99.99	157	
HOMA2-%B	128.2	90.00	110.00	141	
Cortisol : DHEA-S	0.16	0	0.09	128	
HOMA2-IR	1.53	0.75	1.25	106	
Anion Gap	14.7	7.00	12.00	104	
Eosinophils - %	4.5	0	3.00	100	
Glucose - Fasting	89.71	75.00	86.00	84	
Non-HDL Cholesterol	146.33	0	110.00	83	
Cholesterol : HDL	3.62	0	3.00	71	
Sex Hormone Binding Globulin - Male	42	30.00	40.00	70	
Monocytes - %	8.2	0	7.00	67	
Methylmalonic Acid	278.2	0	260.00	57	
MCV	90.4	82.00	89.90	56	
Insulin - Fasting	5.19	2.00	5.00	56	
Homocysteine	7.3	5.00	7.20	55	
Globulin - Total	2.81	2.40	2.80	52	
VLDL Cholesterol	15.08	0	15.00	51	
GGT	17	10.00	17.00	50	
Thyroglobulin Abs	<1	0	1.00	50	
ESR - Male	4.8	0	5.00	46	
LDL : HDL - Male	2.18	0	2.28	46	
Lymphocytes - %	43	24.00	44.00	45	
C-Peptide	2.04	1.10	2.10	44	
Creatine Kinase	129.34	65.00	135.00	42	
C-Reactive Protein	4.09	0	4.50	41	
Basophils - %	0.9	0	1.00	40	
Calcium : Phosphorus	3.10	2.30	3.20	39	
Hs CRP - Male	0.49	0	0.55	39	
eAG	102.68	85.00	105.00	38	

Biomarker	Lab result	Optimal range		% deviation	Optimal range	
		Low	High		Low	High
RDW	12.4	11.00	12.60	38		
Hemoglobin A1C	5.2	4.60	5.30	36		
Triglyceride:HDL	1.67	0.50	1.90	34		
Calcium : Albumin	2	0	2.60	27		
ALT	22	10.00	26.00	25		
MCH	30.9	28.00	31.90	24		
Lipase	43	22.00	51.00	22		
Potassium	4.7	4.00	5.00	20		
FSH - Male	5.9	1.60	8.00	17		
Chloride	104	100.00	106.00	17		
Bilirubin - Indirect	0.5	0.10	0.70	17		
Eosinophils - Absolute	0.19	0	0.30	13		
% Testosterone Free - Male	1.96	1.60	2.20	10		
Vitamin D (25-OH)	73.99	50.00	90.00	10		
Copper : Zinc Ratio	1.17	0.70	1.50	9		
T4 - Free	1.29	1.00	1.50	8		
T3 - Free	3.29	3.00	3.50	8		
Sodium	139	135.00	142.00	7		
RBC - Male	4.6	4.20	4.90	7		
eGFR	107	90.00	120.00	7		
AST : ALT	0.55	0	1.00	5		
UIBC	221.94	130.00	300.00	4		
Bilirubin - Direct	0.1	0	0.19	3		
Bilirubin - Total	0.6	0.30	0.90	0		
TIBC	300	250.00	350.00	0		
T3 Uptake	31	27.00	35.00	0		
Free T3 : Free T4	2.54	2.40	2.70	-3		
Cortisol - PM	7.79	6.00	10.00	-5		
Cortisol - Total	12.19	10.00	15.00	-6		
Lymphocytes - Absolute	1.85	0.95	3.10	-8		
Basophils - Absolute	0.04	0	0.10	-10		
Leptin - Male	4.5	1.20	9.50	-10		
T4 - Total	8.29	6.00	11.90	-11		
Free T3 : Reverse T3	25.38	10.00	50.00	-12		
LH - Male	4.3	1.50	9.30	-14		
Uric Acid - Male	4.29	3.50	5.90	-17		
Free Thyroxine Index (T7)	2.6	1.70	4.60	-19		
Ferritin	41	30.00	70.00	-22		
Estradiol - Male	27.99	24.00	39.00	-23		
Monocytes - Absolute	0.35	0.28	0.58	-27		
Hemoglobin - Male	14.2	14.00	15.00	-30		

Biomarker	Lab result	Optimal range		% deviation	Optimal range	
		Low	High		Low	High
Copper - Serum	89.11	70.00	175.00	-32		
% Transferrin saturation	26	24.00	35.00	-32		
Neutrophils - %	43.4	40.00	60.00	-33		
PSA - Total	0.4	0	2.50	-34		
Reverse T3	12.34	10.00	25.00	-34		
T3 - Total	101.95	90.00	168.00	-35		
AST	12	10.00	26.00	-38		
Hematocrit - Male	41	40.00	48.00	-38		
Amylase	45	40.00	86.00	-39		
Fructosamine	193.7	190.00	228.00	-40		
Albumin : Globulin	1.44	1.40	2.10	-44		
MCHC	34.1	34.00	36.00	-45		
Thyroid Peroxidase (TPO) Abs	0.2	0	6.80	-47		
HDL Cholesterol	55.30	55.00	70.00	-48		
TSH	1.31	1.30	3.00	-49		
CO2	25	25.00	30.00	-50		
Folate - RBC	398.09	400.00	637.00	-51		
Neutrophils - Absolute	1.87	1.90	4.20	-51		
QUICKI	0.37	0.45	5.00	-52		
Gastrin	42.47	45.00	90.00	-56		
Vitamin B12	426.99	450.00	800.00	-57		
Protein - Total	6.86	6.90	7.40	-58		
Folate - Serum	14.19	15.00	25.00	-58		
Sodium : Potassium	29.57	30.00	35.00	-59		
Calcium	9.12	9.20	10.00	-60		
Phosphorus	2.88	3.00	4.00	-62		
Testosterone Total - Male	649.55	700.00	1100.00	-63		
Creatinine	0.76	0.80	1.10	-63		
LDH	131	140.00	200.00	-65		
Iron - Serum	77.93	85.00	130.00	-66		
Fibrinogen	282.65	295.00	369.00	-67		
BUN	8.96	10.00	16.00	-67		
HOMA2-%S	65	85.00	200.00	-67		
Zinc - Serum	76.13	80.00	100.00	-69		
Magnesium - RBC	5.77	6.00	6.80	-78		
Zinc - RBC	9.09	10.40	14.70	-80		
Testosterone Free - Male	127.43	150.00	224.00	-81		
Platelets	217	264.00	385.00	-89		
BUN : Creatinine	7.43	10.00	16.00	-93		
Testosterone Bioavailable - Male	280.93	375.00	575.00	-97		
Magnesium - Serum	2.05	2.20	2.50	-99		

Biomarker	Lab result	Optimal range		% deviation	Optimal range	
		Low	High		Low	High
Total WBCs	4.3	5.50	7.50	-110		
Alk Phos	51	70.00	100.00	-113		
DHEA-S - Male	74.43	350.00	690.00	-131		
% Testosterone Bioavailable - Male	43.27	53.00	65.00	-131		
Albumin	4.05	4.50	5.00	-140		
Progesterone - Male	0.64	1.00	1.20	-231		
Neutrophil : Lymphocyte	1.01	1.80	2.20	-248		

Blood Test History

The Blood Test History Report lists the results of your patient's Chemistry Screen and CBC tests 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 and allows you to track progress.

Key

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

Biomarker	Latest Test Result Quest Jan 29 2023
Glucose - Fasting	89.71 ↑
Hemoglobin A1C	5.2
eAG	102.68
Insulin - Fasting	5.19 ↑
C-Peptide	2.04
Fructosamine	193.7
HOMA2-%B	128.2 ↑ ↑
HOMA2-%S	65 ↓ ↓
HOMA2-IR	1.53 ↑
QUICKI	0.37 ↓
BUN	8.96 ↓
Creatinine	0.76 ↓
BUN : Creatinine	7.43 ↓
eGFR	107
PSA - Total	0.4
Sodium	139
Potassium	4.7
Chloride	104

Biomarker	Latest Test Result Quest Jan 29 2023
CO2	25
Sodium : Potassium	29.57 ↓ ↓
Anion Gap	14.7 ↑
Uric Acid - Male	4.29
Creatine Kinase	129.34
Leptin - Male	4.5
Amylase	45
Lipase	43
Protein - Total	6.86 ↓
Albumin	4.05 ↓
Globulin - Total	2.81 ↑
Albumin : Globulin	1.44
Calcium	9.12 ↓
Phosphorus	2.88 ↓
Magnesium - Serum	2.05 ↓
Magnesium - RBC	5.77 ↓
Copper - Serum	89.11
Zinc - Serum	76.13 ↓
Zinc - RBC	9.09 ↓
Copper : Zinc Ratio	1.17
Calcium : Albumin	2
Calcium : Phosphorus	3.10
Alk Phos	51 ↓
AST	12
ALT	22
LDH	131 ↓

Biomarker	Latest Test Result Quest Jan 29 2023
Bilirubin - Total	0.6
Bilirubin - Direct	0.1
Bilirubin - Indirect	0.5
GGT	17
AST : ALT	0.55
Iron - Serum	77.93 ↓
Ferritin	41
TIBC	300
UIBC	221.94
% Transferrin saturation	26
Cholesterol - Total	202.24 ↑ ↑
Triglycerides	94.77 ↑
LDL Cholesterol	121.42 ↑ ↑
HDL Cholesterol	55.30
Non-HDL Cholesterol	146.33 ↑ ↑
VLDL Cholesterol	15.08 ↑
Cholesterol : HDL	3.62 ↑
Triglyceride:HDL	1.67
LDL : HDL - Male	2.18
Homocysteine	7.3 ↑
TSH	1.31
T4 - Total	8.29
T4 - Free	1.29
T3 - Total	101.95
T3 - Free	3.29
Reverse T3	12.34

Biomarker	Latest Test Result Quest Jan 29 2023
T3 Uptake	31
Free Thyroxine Index (T7)	2.6
Thyroid Peroxidase (TPO) Abs	0.2
Thyroglobulin Abs	<1
Free T3 : Reverse T3	25.38
Free T3 : Free T4	2.54
Vitamin D (25-OH)	73.99
Vitamin B12	426.99 ↓
Folate - Serum	14.19 ↓
Folate - RBC	398.09 ↓
Methylmalonic Acid	278.2 ↑
DHEA-S - Male	74.43 ↓ ↓
FSH - Male	5.9
LH - Male	4.3
Testosterone Total - Male	649.55 ↓
Testosterone Free - Male	127.43 ↓
Sex Hormone Binding Globulin - Male	42 ↑
Estradiol - Male	27.99
Progesterone - Male	0.64 ↓
Cortisol - Total	12.19
Cortisol : DHEA-S	0.16 ↑ ↑
Cortisol - PM	7.79
Gastrin	42.47 ↓
Testosterone Bioavailable - Male	280.93 ↓
% Testosterone Bioavailable - Male	43.27 ↓
% Testosterone Free - Male	1.96

Biomarker	Latest Test Result Quest Jan 29 2023
RBC - Male	4.6
Hemoglobin - Male	14.2
Hematocrit - Male	41
MCV	90.4 ↑
MCH	30.9
MCHC	34.1
Platelets	217 ↓
MPV	11.2 ↑
RDW	12.4
Total WBCs	4.3 ↓
Neutrophils - %	43.4
Lymphocytes - %	43
Monocytes - %	8.2 ↑
Eosinophils - %	4.5 ↑ ↑
Basophils - %	0.9
Neutrophils - Absolute	1.87 ↓
Lymphocytes - Absolute	1.85
Monocytes - Absolute	0.35
Eosinophils - Absolute	0.19
Basophils - Absolute	0.04
Neutrophil : Lymphocyte	1.01 ↓
Hs CRP - Male	0.49
C-Reactive Protein	4.09
ESR - Male	4.8
Fibrinogen	282.65 ↓

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	3	29	69	14	6	0	121

Above Optimal

11.2
fL

MPV

MPV or Mean Platelet Volume is a calculated measurement of the relative size of platelets in the blood. Elevated levels of MPV are seen with platelet destruction.

94.77
mg/dL

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

202.24
mg/dL

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. Increased cholesterol is just one of many independent risk factors for cardiovascular disease. It is also associated with metabolic syndrome, hypothyroidism, biliary stasis, and fatty liver.

121.42
mg/dL

LDL CHOLESTEROL

LDL functions to transport cholesterol and other fatty acids from the liver to the peripheral tissues for uptake and metabolism by the cells. It is known as "bad cholesterol" because it is thought that this process of bringing cholesterol from the liver to the peripheral tissue increases the risk for atherosclerosis. An increased LDL cholesterol is just one of many independent risk factors for cardiovascular disease. It is also associated with metabolic syndrome, oxidative stress, and fatty liver.

128.2
%

HOMA2-%B

The HOMA2 (Homeostasis Model Assessment) calculator is a tool used to express the degree of insulin sensitivity and insulin resistance. HOMA2-%B helps estimate the beta-cell function of the pancreas. Beta-cells produce insulin. Elevated HOMA2-%B levels indicate an increased beta-cell activity and an increase in insulin production. This points to an increasing trend towards pre-diabetes and insulin resistance.

0.16
ratio

CORTISOL : DHEA-S

Cortisol and DHEA are both hormones produced by the adrenal glands. Evaluating the ratio between cortisol and DHEA-S (the most abundant form of DHEA) can provide information about metabolic health. A higher ratio of cortisol to DHEA-S is associated with stress, metabolic syndrome, and immune dysfunction.

1.53
Index

HOMA2-IR

The HOMA2 (Homeostasis Model Assessment) calculator is a tool used to express the degree of insulin sensitivity and insulin resistance. HOMA2-IR helps estimate the degree of cellular resistance to the hormone insulin. A HOMA2-IR score of 1 is considered optimal. levels above 1 show an increasing trend towards metabolic syndrome, insulin resistance and type 2 diabetes.

14.7
mEq/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.

4.5
%

EOSINOPHILS - %

Eosinophils are a type of White Blood Cell, which are often increased in people that are suffering from intestinal parasites or food or environmental sensitivities/allergies.

89.71
mg/dL

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.

146.33
mg/dl

NON-HDL CHOLESTEROL

Non-HDL cholesterol represents the circulating cholesterol that is not carried by HDL (the protective carrier that collects cholesterol from tissues and blood vessels and transports it back to the liver). An elevated Non-HDL Cholesterol is associated with an increase risk of cardiovascular disease and related events.

3.62
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%.

42
nmol/L

SEX HORMONE BINDING GLOBULIN - MALE

Sex Hormone Binding Globulin (SHBG) is a protein produced primarily in the liver and to some extent the testes and the brain. SHBG acts as a transport molecule for carrying estrogen and testosterone around the body and delivering them to receptors on the cells. Elevated SHBG levels in the blood cause too much testosterone to be bound thus it becomes less available to do its functional work in the body and leads to a decrease in Free Testosterone levels.

8.2
%

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.

278.2
nmol/L

METHYLMALONIC ACID

Methylmalonic acid (MMA) is a byproduct of the metabolism of certain fatty acids and amino acids, a process that requires vitamin B12. Testing for MMA can help detect an early B12 deficiency and help differentiate between folate and B12 deficiency. Elevated levels reflect a B12 deficiency.

90.4
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.

5.19
µIU/ml

INSULIN - FASTING

Insulin is the hormone released by the pancreas in response to rising blood glucose levels and decreases blood glucose by transporting glucose into the cells. Often people lose their ability to utilize insulin to effectively drive blood glucose into energy-producing cells. This is commonly known as "insulin resistance" and is associated with increasing levels of insulin in the blood. Excess insulin is associated with greater risks of heart attack, stroke, metabolic syndrome, and diabetes.

7.3
µmol/L

HOMOCYSTEINE

Homocysteine is a molecule formed from the incomplete metabolism of the amino acid methionine. Increased levels of homocysteine are associated with an increased risk of cardiovascular disease and stroke.

2.81
g/dL

GLOBULIN - TOTAL

Globulins constitute the body's antibody system and Total globulin is a measurement of all the individual globulin fractions in the blood. An elevated total globulin level is associated with hypochlorhydria, liver dysfunction, immune activation, oxidative stress, and inflammation.

15.08
mg/dl

VLDL CHOLESTEROL

VLDL is a lipoprotein formed in the liver to transport endogenous triglycerides, phospholipids, protein, and cholesterol. It serves, from a functional perspective, as an internal lipid transport molecule, moving triglyceride and other lipids from one area of the body to another.

Below Optimal

1.01
Ratio

NEUTROPHIL : LYMPHOCYTE

The neutrophil-lymphocyte ratio (NLR) reflects important components of the cell-mediated inflammatory response, i.e. neutrophils and lymphocytes. Decreased levels are an indicator of a trend towards a chronic viral infection.

0.64
ng/ml

PROGESTERONE - MALE

Progesterone is often considered to be a female hormone but men produce progesterone too. In the body, it's converted into testosterone and serves to oppose and balance estrogen. As men age, their progesterone levels drop, which may cause the testosterone levels to fall.

4.05
g/dL

ALBUMIN

Albumin is one of the major blood proteins. Produced primarily in the liver, Albumin plays a major role in water distribution and serves as a transport protein for hormones and various drugs. Albumin levels are affected by digestive dysfunction and a decreased albumin can be an indication of malnutrition, digestive dysfunction due to HCl need (hypochlorhydria), or liver dysfunction. Malnutrition leads to a decreased albumin level in the serum primarily from lack of available essential amino acids. Decreased albumin can also be a strong indicator of oxidative stress and excess free radical activity.

43.27
%

% TESTOSTERONE BIOAVAILABLE - MALE

This test measures the % of bioavailable testosterone found in the blood. Bioavailable testosterone is the amount of testosterone in the blood that is readily available for biological activity. Decreased levels of % bioavailable testosterone are associated with a number of dysfunctions including metabolic syndrome, an increased risk of cardiovascular disease, an increase in abdominal obesity, decreased libido, and erectile dysfunction.

74.43
µg/dL

DHEA-S - MALE

DHEA is produced primarily from the adrenals and is the most abundant circulating steroid in the human body and influences more than 150 known anabolic (repair) functions throughout the body and brain. It is the precursor for the sex hormones: testosterone, progesterone, and estrogen. Decreased levels are associated with adrenal insufficiency and many common age-related conditions, including diseases of the nervous, cardiovascular, and immune systems such as metabolic syndrome, coronary artery disease, osteoporosis, mood disorders, and sexual dysfunction. Ideally, DHEA levels should be maintained at the level of a healthy 30-year-old to maximize the anti-aging effects

51
IU/L

ALK PHOS

Alkaline phosphatase (ALP) is a group of isoenzymes that originate in the bone, liver, intestines, skin, and placenta. It has a maximal activity at a pH of 9.0-10.0, hence the term alkaline phosphatase. Decreased levels of ALP have been associated with zinc deficiency.

4.3
k/cumm

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.

2.05
mg/dl

MAGNESIUM - SERUM

Magnesium is important for many different enzymatic reactions, including carbohydrate metabolism, protein synthesis, nucleic acid synthesis, and muscular contraction. Magnesium is also needed for energy production and is used by the body in the blood clotting mechanism. A decreased magnesium is a common finding with muscle cramps.

280.93
ng/dl

TESTOSTERONE BIOAVAILABLE - MALE

Bioavailable testosterone is the amount of testosterone in the blood is readily available for biological activity. Decreased bioavailable testosterone levels are associated with a number of dysfunctions including metabolic syndrome, an increased risk of cardiovascular disease, increase in abdominal obesity, decreased libido and erectile dysfunction.

7.43
Ratio

BUN : CREATININE

The BUN/Creatinine is a ratio between the BUN and Creatinine levels. A decreased level is associated with a diet low in protein.

217
10E3/µL

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.

127.43
pg/ml

TESTOSTERONE FREE - MALE

Testosterone is the primary sex hormone for men. The free testosterone test measures the testosterone that is unbound to serum proteins such as Sex Hormone Binding Globulin (SHBG) and albumin. Decreased free testosterone levels are associated with a number of dysfunctions including metabolic syndrome, an increased risk of cardiovascular disease, increase in abdominal obesity, decreased libido and erectile dysfunction.

9.09
mg/L

ZINC - RBC

Zinc is a trace mineral that participates in a significant number of metabolic functions and is found throughout the body's tissues and fluids. Low levels of serum zinc are associated with zinc deficiency. Measuring RBC zinc provides a better assessment of intracellular and long-term zinc status than serum zinc alone.

5.77
mg/dl

MAGNESIUM - RBC

Magnesium is important for many different enzymatic reactions, including carbohydrate metabolism, protein synthesis, nucleic acid synthesis, and muscular contraction. Magnesium is also needed for energy production and is used by the body in the blood clotting mechanism. A decreased RBC magnesium is a sign of magnesium deficiency and is a common finding with muscle cramps.

76.13
ug/dL

ZINC - SERUM

Zinc is a trace mineral that participates in a significant number of metabolic functions and is found throughout the body's tissues and fluids. Low levels of serum zinc are associated with zinc deficiency.

65
%

HOMA2-%S

The HOMA2 (Homeostasis Model Assessment) calculator is a tool used to express the degree of insulin sensitivity and insulin resistance. HOMA2-%S helps estimate the degree of cellular sensitivity to the hormone insulin. A decreasing HOMA2-%S score is an indication of a decrease in insulin sensitivity at the cellular level. This a sign of a trend towards insulin resistance, pre-diabetes, and eventually type 2 diabetes.

8.96
mg/dL

BUN

BUN or Blood Urea Nitrogen reflects the ratio between the production and clearance of urea in the body. Urea is formed almost entirely by the liver from both protein metabolism and protein digestion. The amount of urea excreted as BUN varies with the amount of dietary protein intake. A low BUN is associated with malabsorption, a decrease in digestive enzymes called pancreatic insufficiency, and a diet low in protein.

282.65
mg/dl

FIBRINOGEN

Fibrinogen is one of the principal blood clotting proteins. It is produced in the liver and liver disease and dysfunction can cause a decrease in the level of circulating fibrinogen.

77.93
µg/dL

IRON - SERUM

Serum iron reflects iron that is bound to serum proteins such as transferrin. Serum iron levels will begin to fall somewhere between the depletion of the iron stores and the development of anemia. Decreased iron levels are associated with iron deficiency anemia, hypochlorhydria and internal bleeding. The degree of iron deficiency is best appreciated with ferritin, TIBC and % transferrin saturation levels.

131
IU/L

LDH

LDH represents a group of enzymes that are involved in carbohydrate metabolism. Decreased levels of LDH often correspond to hypoglycemia (especially reactive hypoglycemia), pancreatic function, and glucose metabolism.

0.76
mg/dL

CREATININE

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

649.55
ng/dl

TESTOSTERONE TOTAL - MALE

Testosterone is the primary sex hormone for men. The total testosterone test measures both the testosterone that is bound to serum proteins and the unbound form (free testosterone). Decreased total testosterone levels are associated with a number of dysfunctions including metabolic syndrome, an increased risk of cardiovascular disease, increase in abdominal obesity, decreased libido and erectile dysfunction.

2.88
mg/dL

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.

9.12
mg/dL

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.

29.57
ratio

SODIUM : POTASSIUM

The Sodium:Potassium ratio is determined from the serum sodium and serum potassium levels. Both of these elements are under the influence of the adrenal glands. A decreased Sodium:Potassium ratio is associated with chronic stress and adrenal insufficiency.

14.19
ng/ml

FOLATE - SERUM

Folate functions as a coenzyme in the process of methylation. Along with vitamin B12, folate is essential for DNA synthesis. Low folate intake can result in folate deficiency, which can impair methylation, DNA synthesis, and red blood cell production.

6.86
g/dL

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.

426.99
pg/ml

VITAMIN B12

Vitamin B12 is an essential nutrient for DNA synthesis and red blood cell maturation and is also necessary for myelin sheath formation and the maintenance of nerves in the body. Decreased serum B12 levels are associated with a deficiency of B12, insufficient B12 intake in the diet, or malabsorption.

42.47
pg/ml

GASTRIN

Gastrin is a hormone that stimulates the release of Hydrochloric Acid (HCL) from the parietal cells of the stomach. Decreased levels of gastrin are associated with hypochlorhydria or decreased secretion of HCL, pancreatic insufficiency and biliary insufficiency.

0.37
Index

QUICKI

QUICKI is a simple calculation that uses fasting glucose and fasting insulin to assess insulin sensitivity. Decreased QUICKI results are associated with a trend towards increasing insulin resistance, cardiovascular risk, metabolic syndrome, and fatty liver.

1.87
k/cumm

NEUTROPHILS - ABSOLUTE

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 - Absolute* is an actual count of the number of neutrophils in a known volume of blood. Decreased levels are often seen in chronic viral infections.

398.09
ng/ml

FOLATE - RBC

Folate functions as a coenzyme in the process of methylation. Along with vitamin B12, folate is essential for DNA synthesis. Low folate intake can result in folate deficiency, which can impair methylation, DNA synthesis, and red blood cell production.

4

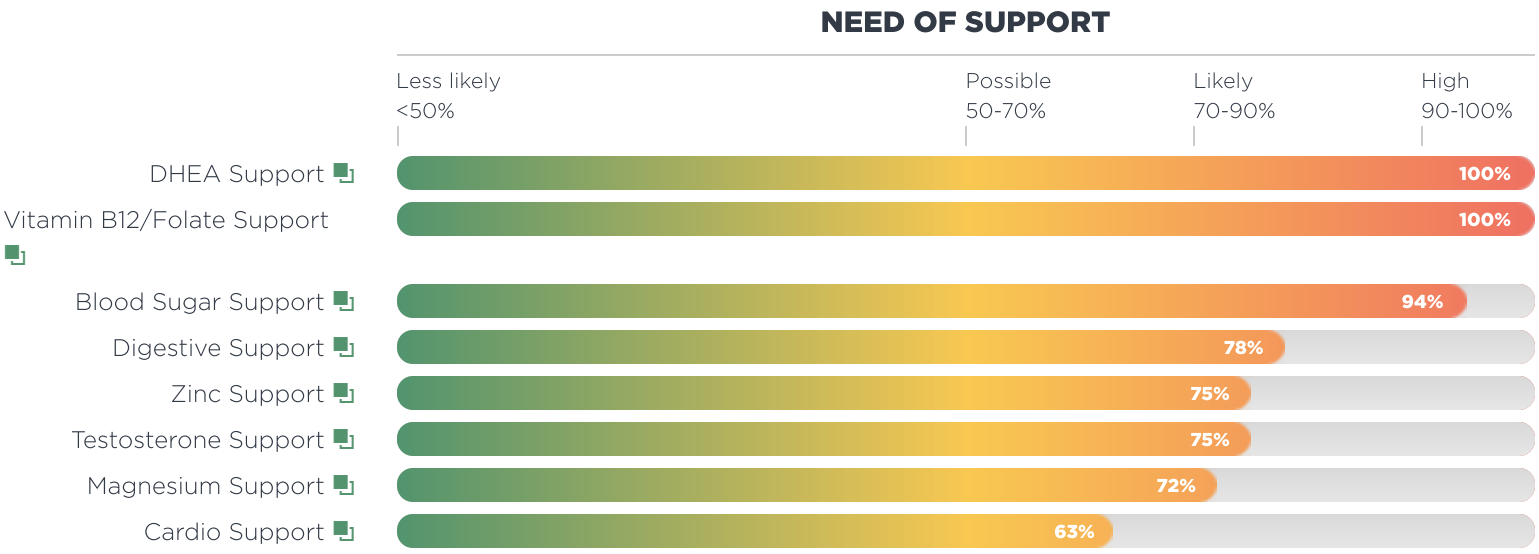
The Health Concerns report takes all the information on the Analytics and Assessment sections and focuses on the top areas of health concern that need the most support.

Health Concerns

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.

DHEA SUPPORT

The results of this blood test indicate that this patient's DHEA levels might be lower than optimal and shows a need for DHEA supplementation.

Rationale

DHEA-S - Male ↓

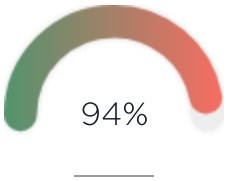
VITAMIN B12/FOLATE SUPPORT

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

Rationale

Methylmalonic Acid ↑, MCV ↑, Homocysteine ↑, Total WBCs ↓, Folate - Serum ↓, Vitamin B12 ↓

BLOOD SUGAR SUPPORT

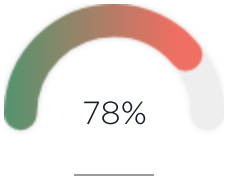


The results of this blood test indicate a tendency towards metabolic syndrome and a need for blood sugar support.

Rationale

Glucose - Fasting ↑, Triglycerides ↑, Insulin - Fasting ↑, Cholesterol - Total ↑, LDL Cholesterol ↑, DHEA-S - Male ↓

DIGESTIVE SUPPORT

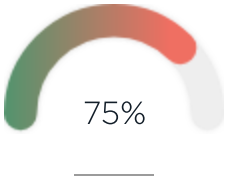


The results of this blood test indicate a tendency towards hypochlorhydria and a need for digestive support.

Rationale

Protein - Total ↓, Globulin - Total ↑, Albumin ↓, Phosphorus ↓, Alk Phos ↓, MCV ↑, Iron - Serum ↓, Anion Gap ↑, Calcium ↓, Gastrin ↓

ZINC SUPPORT

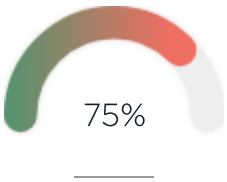


The results of this blood test indicate that this patient's zinc levels might be lower than optimal and shows a need for zinc supplementation.*

Rationale

Alk Phos ↓, Zinc - Serum ↓

TESTOSTERONE SUPPORT

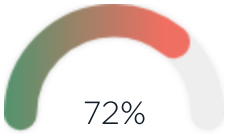


The results of this blood test indicate a trend towards testosterone deficiency and a need for testosterone metabolism support.

Rationale

Testosterone Total - Male ↓, Testosterone Free - Male ↓

MAGNESIUM SUPPORT

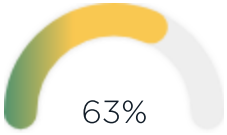


The results of this blood test indicate that this patient's magnesium levels might be lower than optimal and shows a need for magnesium supplementation.

Rationale

Magnesium - Serum ↓, Magnesium - RBC ↓

CARDIO SUPPORT



The results of this blood test indicate a higher than optimal cardiovascular risk for this patient and shows a need for cardiovascular support.

Rationale

Glucose - Fasting ↑, Cholesterol - Total ↑, Triglycerides ↑, LDL Cholesterol ↑, Homocysteine ↑, Testosterone Total - Male ↓, Insulin - Fasting ↑, Testosterone Free - Male ↓

Further Testing

Advanced practitioner only report

Based on the results of the analysis of this blood test, the following areas may require further investigation. The suggestions for further testing are merely examples and do not attempt to provide you with an exhaustive list of further evaluation methods.

There are no results available for this report.

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Highly detailed and interpretive descriptions of the results presented in each of the assessment and analysis section reports.

Appendix

What to Look For When Values Are Out of Range

Advanced professional only report

This report shows what you need to look for when the blood tests results are out of the optimal reference range. The report lists all the biomarkers that are above or below the optimal reference range and lists all the possible associated health concerns with a short description.

% TESTOSTERONE BIOAVAILABLE - MALE ↓

(43.27 %)

Decreased % Bioavailable T Associated with:

Metabolic syndrome, an increased risk of cardiovascular disease, an increase in abdominal obesity, decreased libido, and erectile dysfunction.

ALBUMIN ↓

(4.05 g/dL)

Hypochlorhydria

A decreased albumin level (<4.0 or 40g/L) is often associated with a decreased production of hydrochloric acid in the stomach (hypochlorhydria). Hypochlorhydria is associated with an increased globulin level (>2.8 or 28 g/L) and a normal or decreased total protein (<6.9 or 69 g/L) and/or albumin (<4.0 or 40g/L), an increased BUN (>16 or 5.71 mmol/L), a decreased or normal total protein (<6.9 or 69 g/L) and/or albumin (<4.0 or 40g/L) and/or decreased serum phosphorous (<3.0 or <0.97 mmol/L). Other values that may be reflective of a developing or chronic hypochlorhydria include increased or decreased gastrin (<50 or >100), an increased MCV (>90) and MCH (>31.9), a decreased or normal calcium (<9.5 or 2.38 mmol/L) and iron (<85 or 15.22 mmol/dL), a decreased chloride (<100), an increased anion gap (>12) and a decreased alkaline phosphatase (<70).

Liver dysfunction

Albumin is produced almost entirely by the liver and dysfunction in the liver will have a great impact on albumin production and serum albumin levels. Therefore, a decreased albumin level may be indicative of a liver dysfunction that prevents the synthesis and formation of protein. A decreased albumin (<4.0 or 40g/L) may be observed before any changes in liver enzymes are noted. Functionally oriented liver problems, such as detoxification issues, liver congestion, and conjugation problems are extremely common and should be evaluated based upon early prognostic indicators. The liver should always be viewed in the context of the hepato-biliary tree. Some of the key clinical indicators include:

1. Pain between shoulder blades
2. Stomach upset by greasy foods
3. If drinking alcohol, easily intoxicated
4. Headache over the eye
5. Sensitive to chemicals (perfume, cleaning solvents, insecticides, exhaust, etc.)
6. Hemorrhoids or varicose veins

Oxidative stress and excess Free Radical Activity

Free radical pathology, which increases the risk for developing a neoplasm, should be investigated if albumin levels are decreased (<4.0 or 40g/L) along with a decreased lymphocyte count (<20), a total cholesterol that is suddenly below its historical level, an increased total globulin (>2.8 or 28 g/L) an increased uric acid (>5.9 or > 351 mmol/dL) and low platelet levels (<150). Oxidative stress can cause an increased destruction of red blood cells; in these situations you will see an elevated bilirubin level (>1.2 or 20.5 mmol/dL).

Vitamin C need

Albumin will frequently be decreased (<4.0 or 40g/L) along a decreased HCT (<37 or 0.37 in women and 40 or 0.4 in men), HGB (<13.5 or 135 g/L in women and <14 or 140 in men), MCH (<28), MCHC (<32), and serum iron (< 85 or 15.22 mmol/dL). There will also be an increased MCV (>90), alkaline phosphatase (>100), and fibrinogen >300.

Pregnancy

A decreased albumin reading (<4.0 or 40g/L) is considered normal in pregnancy.

ALK PHOS ↓

(51 IU/L)

Zinc deficiency

Alkaline phosphatase is a zinc dependent enzyme. Decreased levels (<70) have been associated with zinc deficiency along with decreased WBC or RBC zinc levels and a low normal or decreased total WBC. Follow up a decreased alkaline phosphatase with a zinc taste test.

ANION GAP ↑

(14.7 mEq/L)

Thiamine (vitamin B1) need

An increased anion gap (>12) is associated with thiamine deficiency. If the anion gap is increased (>12) along with a decreased CO2 (<25), thiamine deficiency is possible. Hemoglobin and hematocrit levels may be normal or decreased (<37 or 0.37 in women and 40 or 0.4 in men). Due to thiamine's role in glycolysis, LDH levels may be decreased and glucose levels may be normal to increased (> 86 mg/dL or 4.77 mmol/L).

Metabolic Acidosis

Consider metabolic acidosis if the anion gap is increased (>12) along with a decreased CO2 (<25) and an increased chloride (>106).

BUN ↓

(8.96 mg/dL)

Diet- low protein

A decreased BUN level (<10 or 3.57 mmol/L) is associated with a diet that is low in protein. Low protein diets may show up with a decreased BUN level (<10 or 3.57 mmol/L) and a decreased BUN/Creatinine ratio (<10).

Malabsorption

A decreased BUN (<10 or 3.57 mmol/L) is associated with a chronic intestinal malabsorption, which is an inability of nutrients to be absorbed through the intestinal wall. Malabsorption can lead to a functional protein deficit, which in turn will lead to lower levels of protein catabolism and low BUN levels.

Pancreatic insufficiency

A decreased BUN (<10 or 3.57 mmol/L) is associated with a pancreatic insufficiency. A decreased level of digestive enzymes secreted from the pancreas, especially protease, can lead to a functional protein deficit. This in turn will lead to lower levels of protein catabolism and low BUN levels. Total WBC count may be decreased.

Liver dysfunction

A decreased BUN (<10 or 3.57 mmol/L) is associated with liver dysfunction. Dysfunction in the liver will have a great impact on protein production and synthesis, which will affect the availability of protein for catabolism, resulting in low BUN levels.

Posterior pituitary dysfunction

A decreased BUN (<10 or 3.57 mmol/L) along with a decreased urinary specific gravity and a decreased BUN/Creatinine ratio that is below 10 can be an indication of dysfunction in the posterior pituitary, which is responsible for the production of Anti Diuretic Hormone (ADH).

BUN : CREATININE ↓

(7.43 Ratio)

Diet- Low protein

A decreased BUN/Creatinine ratio (<10) is associated with a diet that is low in protein. BUN levels may be also be decreased (<10 or 3.57 mmol/L)

Posterior pituitary dysfunction

A BUN/Creatinine ratio decreased below 10 may be an indication of inappropriate secretion of anti-diuretic hormone (ADH -Vasopressin) due to posterior pituitary dysfunction. You may also see a decreased BUN (<10 or 3.57 mmol/L) along with a decreased urinary specific gravity.

CALCIUM ↓

(9.12 mg/dL)

Before considering the clinical implications listed below, please check the serum albumin level to make sure that a decrease in serum albumin is not the cause for a relative serum calcium decrease, as much of the serum calcium is bound to albumin and this is the most common cause of a decreased calcium level.

For every decrease in albumin by 1 mg/dL, calcium should be corrected upward by 0.8 mg/dL.

Parathyroid Hypofunction

Parathyroid hypofunction will lead to decreased PTH levels that can cause decreased serum calcium levels. If calcium is decreased (<9.2 or 2.30 mmol/L) along with a high phosphorous level (>4.0 or 1.29 mmol/L), parathyroid hypofunction is possible. Alkaline phosphatase levels may also be normal or decreased (<70). Follow up with a serum parathyroid hormone test. If parathyroid hormone levels are also decreased presume clinical hypoparathyroidism exists.

Hypochlorhydria

A decreased serum calcium is often associated with a decreased production of hydrochloric acid in the stomach (hypochlorhydria). Consider hypochlorhydria with a decreased serum calcium (<9.2 or 2.30 mmol/L), an increased or decreased globulin level (< 2.4 / 24 g/L or >2.8 / 28 g/L) and a normal or decreased total protein (<6.9 or 69 g/L) along with an increased BUN (>16 or 5.71 mmol/L), a decreased albumin (<4.0 or 40g/L) and a decreased serum phosphorous (<3.0 or <0.97 mmol/L). The more elements outside the optimal range, the greater the likelihood of hypochlorhydria. Other values that may be reflective of a developing or chronic hypochlorhydria include increased or decreased gastrin (<50 or >100), an increased MCV (>90) and MCH (>31.9), a decreased iron (< 85 or 15.22 mmol/dL), a decreased CO2 (<25), decreased chloride level (<100), an increased anion gap (>12), and a decreased alkaline phosphatase (<70).

Calcium Deficiency

Suspect calcium deficiency with a low serum calcium (<9.2 or 2.30 mmol/L) along with a high phosphorous level (>4.0 or 1.29 mmol/L) and a decreased vitamin D level (<40 ng/ml). Consider that this may not just be a case of needing supplementation becuase there are a number of other factors at play here that may be the cause of the calcium deficiency in the first place: hypochlorhydria, lack of vitamin D and systemic pH issues to name a few.

CHOLESTEROL - TOTAL ↑

(202.24 mg/dL)

Increased cardiovascular disease risk

Increased cholesterol levels are associated with an increased risk of developing cardiovascular disease, atherosclerosis, coronary artery disease and stroke. Although this may be true, it is important to look at many of the other risks for this disease before jumping to conclusion that elevated cholesterol levels are the culprit. Other risks for atherosclerosis, cardiovascular disease and stroke include: smoking, elevated homocysteine levels, elevated fasting glucose, elevated fasting insulin, elevated Hs-CRP, elevated fibrinogen, B6, B12 and folate deficiency, ingestion of chlorine, blood sugar dysregulation, and hypertension. Consider an increased risk of cardiovascular disease with an increased triglyceride level (>80 or 0.90 mmol/L) in relation to an increased total cholesterol (>180 or 4.66 mmol/L) with an increased uric acid level (>5.9 or > 351 mmol/dL), a decreased HDL (< 45 or < 1.16 mmol/L) and an increased LDL (>100 or 2.59 mmol/L). Platelet levels may also be increased (>385). Homocysteine levels are frequently increased > 7.2, Hs-CRP are frequently >0.55 in men and >1.5 in women, and fibrinogen levels are frequently increased above 300.

Primary hypothyroidism

Primary hypothyroidism is **possible** if the total cholesterol is increased (>180 or 4.66 mmol/L) along with an increased triglyceride (>80 or >0.90 mmol/L) and TSH (>2.0).

Adrenal insufficiency

Consider adrenal insufficiency if the total cholesterol is elevated (>180 or 4.66 mmol/L) with an increased triglyceride level (>80 or >0.90 mmol/L) and a decreased serum potassium (<4.0). Confirm with salivary adrenal studies or other functional adrenal tests.

Secondary Hypothyroidism (Anterior pituitary dysfunction)

Increased cholesterol levels are associated with thyroid hypofunction that is secondary to an anterior pituitary dysfunction. If cholesterol levels are increased (>180 or 4.66 mmol/L) with a decreased TSH (<1.3), and an elevated serum triglyceride (>80 or >0.90 mmol/L), then consider that anterior pituitary hypofunction is **probable**.

Gallbladder dysfunction - Biliary stasis

Thickened bile is the hallmark of biliary stasis. It may occur if the total cholesterol is increased (>180 or 4.66 mmol/L). GGTP levels will frequently be increased (>30) but not necessarily. Bilirubin levels may also be elevated (>1.2 or 20.5 mmol/dL). There may also be an increased alkaline phosphatase (>100) and SGOT/AST and SGPT/ALT may be normal or increased (>30). However, many cases of biliary stasis will show normal lab values.

Metabolic Syndrome

If triglycerides are increased above the total cholesterol level with increased LDL cholesterol (>100 or 2.59 mmol/L), a decreased HDL (< 55 or < 1.42 mmol/L), an increased fasting blood glucose (> 86 mg/dL or 4.77 mmol/L) and an increased fasting insulin (>5), then metabolic syndrome and hyperinsulinemia is **probable**.

Fatty liver (early development) and Liver congestion

If total cholesterol (>180 or 4.66 mmol/L), LDL (>100 or 2.59 mmol/L) and triglyceride levels (>80 or >0.90 mmol/L) are increased, and HDL levels are decreased (< 55 or < 1.42 mmol/L), then fatty liver is **possible**. Liver congestion, due to the early development of fatty liver, should be considered if total cholesterol is above 180 or 4.66 mmol/L, triglycerides are increased (>80 or >0.90 mmol/L), and the SGPT/ALT is below 10.

Early stage of insulin resistance

Elevated cholesterol and other lipids often accompany the elevated glucose levels that are seen in insulin resistance.

Poor metabolism and utilization of fats

This is often the case in patients that are eating an optimal diet and have elevated cholesterol and triglyceride levels.

Early stage Diabetes

Elevated blood lipids are seen in patients with diabetes. The triglycerides are often higher than the total cholesterol level. Lipid metabolism problems are a hallmark of the early stages of diabetes.

CHOLESTEROL : HDL ↑

(3.62 Ratio)

A high cholesterol/HDL ratio is associated with an increased risk of cardiovascular disease.

CORTISOL : DHEA-S ↑

(0.16 ratio)

Stress

An elevated cortisol:DHEA-S ratio may be reflective of increased levels of the stress hormone cortisol. As stress becomes chronic, DHEA-S will decline followed by a decrease in cortisol as adrenal fatigue sets in. A higher ratio is also associated with weekdays versus weekends, and even the stress of athletic training.

Immune Dysfunction

Elevated cortisol to DHEA-S ratio is associated with immunosuppression and increased risk of mortality, including death due to infection. Cortisol is immunosuppressive while DHEA-S is immune supportive.

Metabolic Syndrome

A higher cortisol:DHEA-S ratio is associated with incidence of metabolic syndrome as well as four of its components, i.e., high glucose, high triglycerides, high blood pressure, and low HDL.

Cognitive Dysfunction

An elevated cortisol:DHEA-S ratio has been associated with a decline in memory and cognitive performance, particularly when due to elevated cortisol which can be neurotoxic. An elevated ratio has also been associated with ADHD, treatment-resistant depression, and cognitive deterioration.

Aging

An elevated ratio can be seen as DHEA production tends to decline with age even with cortisol remaining stable, causing an increase in the relative ratio. This altered ratio is associated with mood disturbances, anxiety, and confusion. The higher cortisol:DHEA-S ratio and associated changes with aging can be buffered to some extent with aerobic activity.

Sarcopenia

Higher cortisol and a higher cortisol to DHEA-S ratio are associated with muscle wasting known as sarcopenia. This effect may be due to elevated cortisol which is catabolic, as well as a decline in DHEA-S which is anabolic.

CREATININE ↓

(0.76 mg/dL)

Muscle Atrophy/Nerve-Muscle Degeneration

Due to its connection to muscle metabolism serum creatinine will be decreased in cases of muscle atrophy or nerve-muscle degeneration.

DHEA-S - MALE ↓

(74.43 µg/dL)

Adrenal Insufficiency

Physiological stress raises cortisol output from the adrenal glands, which causes a decrease in DHEA-S levels in the serum and an increased cortisol to DHEA ratio, a hallmark sign for stage 2 and 3 adrenal insufficiency.

Hyperinsulinemia

High levels of insulin in the blood (hyperinsulinemia)increases cortisol and epinephrine output and decreases the DHEA levels in the serum. Low DHEA-S levels are found in early and late-stage insulin resistance and Diabetes.

Immune Insufficiency & Low sIgA

Cortisol and DHEA systemically modulate the production and turnover of specialized immune cells called immunocytes (also known as plasmacytes) that produce the secretory antibodies that protect us. The primary antibody of defense is secretory IgA (sIgA). When cortisol is elevated and DHEA is low, suppression of these mucosal immune cells occurs, compromising our first-line immune defense, resulting in low sIgA output.

Low levels of DHEA are associated with many common age-related conditions

Low levels of DHEA are associated with many common age-related conditions, including diseases of the nervous, cardiovascular, and immune systems such as metabolic syndrome, coronary artery disease, osteoporosis, mood disorders and sexual dysfunction.

EOSINOPHILS - % ↑

(4.5 %)

Intestinal parasites

It is important to do further studies if the Eosinophils - Absolute count is increased (>0.3) and/or the Eosinophils - % is increased (>3), i.e. a digestive stool analysis with ova and parasite, especially if the subjective indicators are present. In some cases the stool tests may be normal, especially with amoebic parasites or if the lab sample was not collected or analyzed appropriately by a qualified lab. Multiple and/or purged samples are sometimes necessary. Intestinal parasites are **probable** and should be ruled out if you see the following: An increased Eosinophils - % (>3%), an increased Eosinophils - Absolute count (>0.3), an increased Basophils - % (>1%), an increased Basophils - Absolute count (>0.1), an increased Monocytes - % (>7%), and an increased Monocytes - Absolute (>0.58).

Food and Environmental allergy/sensitivity

An increased Eosinophils - Absolute count (>0.3) and/or an increased Eosinophils - % (>3%) is associated with food allergies and/or sensitivities. There are a number of sophisticated and expensive tests for specific food allergies. These are often normal. In our experience, a weekly diet diary can be a very helpful tool to investigate possible food allergies and sensitivities. An elimination diet for 4 weeks and a subsequent challenge of suspect foods can help determine the most common foods that a patient is allergic or sensitive to. **Foods that the patient may be sensitive to most often are**: Dairy products, Gluten containing grains, Citrus, Shellfish, Foods containing additives and food dyes. Patients should use the “Coca pulse testing” method or try an elimination challenge diet to successfully identify the main culprits. Several methods of food sensitivity testing are available.

Asthma

An increased Eosinophils - Absolute count (>0.3) and/or an increased Eosinophils - % (>3%) are often seen in asthma due to the connection between allergies and asthma. A digestive stool analysis will frequently indicate dysbiosis in an asthmatic, and a liver detoxification panel will often indicate liver dysfunction.

FIBRINOGEN ↓

(282.65 mg/dl)

Fibrinogen levels may decreased with liver disease or liver dysfunction

FOLATE - RBC ↓

(398.09 ng/ml)

Folate Deficiency

Folate deficiency is common in pregnant women, alcoholics, in patients whose diets do not include raw fruits and vegetables, and in people with structural damage to the small intestine. Low folate levels, however, can also be the result of a primary vitamin B12 deficiency that decreases the ability of cells to take up folate.

Increased Need

All pregnant women need increased amounts of folate for proper fetal development. People with cancer that has metastasized or with chronic hemolytic anemia have an increased need for folate.

Neural Tube Defect

Low folate levels during pregnancy have been associated with neural tube defects in the fetus.

Increased Utilization

Conditions such as liver disease, cancer, and hemolytic disorders may deplete folate in the body through increased utilization and thus cause a decreased folate level

FOLATE - SERUM ↓

(14.19 ng/ml)

Folate Deficiency

Folate deficiency is common in pregnant women, alcoholics, in patients whose diets do not include raw fruits and vegetables, and in people with structural damage to the small intestine. Low folate levels, however, can also be the result of a primary vitamin B12 deficiency that decreases the ability of cells to take up folate.

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Low folate levels during pregnancy have been associated with neural tube defects in the fetus.

Increased Utilization

Conditions such as liver disease, cancer, and hemolytic disorders may deplete folate in the body through increased utilization and thus cause a decreased folate level

GASTRIN ↓

(42.47 pg/ml)

Hypochlorhydria

A decreased gastrin level (<45 pg/ml or 21.64 pmol/L) is associated with a decreased production of hydrochloric acid in the stomach (hypochlorhydria). Hypochlorhydria is also associated with an increased globulin level (>2.8 or 28 g/L) and a normal or decreased total protein (<6.9 or 69 g/L) and/or albumin (<4.0 or 40g/L), an increased BUN (>16 or 5.71 mmol/L), a decreased or normal total protein (<6.9 or 69 g/L) and/or albumin (<4.0 or 40g/L) and/or decreased serum phosphorous (<3.0 or <0.97 mmol/LOther values that may be reflective of a developing or chronic hypochlorhydria include an increased MCV (>90) and MCH (>31.9), a decreased or normal calcium (<9.5 or 2.38 mmol/L) and iron (<85 or 15.22 mmol/dL), a decreased chloride (<100), an increased anion gap (>12) and a decreased alkaline phosphatase (<70)

Biliary insufficiency

A decreased gastrin level (<45 pg/ml or 21.64 pmol/L) is associated with biliary insufficiency, which is a decreased output of bile from the gallbladder. Biliary insufficiency is also associated with an elevated total bilirubin (>1.2 or >20.5 mmol/dL) along with an increased alkaline phosphatase (>100). GGTP, SGOT/AST, and SGPT/ALT may be normal or increased (>30). Cholesterol levels may be also increased (>180 or 4.65 mmol/L) but in many cases of gallbladder dysfunction the cholesterol is decreased (<160 or 4 mmol/L). Many cases of biliary insufficiency will show normal lab values. In these situations suspect biliary insufficiency if there are strong subjective indicators.

Pancreatic insufficiency

A decreased gastrin level (<45 pg/ml or 21.64 pmol/L) is associated with pancreatic insufficiency, which is a decreased output of pancreatic digestive enzymes from the pancreas. Pancreatic insufficiency is also associated with a decreased WBC count (<5.0), a decreased Albumin (<4 or 40), an increased total Globulin (>2.8 or 28), an increased GGT (>30), and a decreased BUN <10 or 3.57 mol/L).

GLOBULIN - TOTAL ↑

(2.81 g/dL)

Hypochlorhydria

An increased total globulin level is often associated with a decreased production of hydrochloric acid in the stomach (hypochlorhydria). Hypochlorhydria is associated with an increased globulin level (>2.8 or 28 g/L) and a normal or decreased total protein (<6.9 or 69 g/L) and/or albumin (<4.0 or 40g/L), an increased BUN (>16 or 5.71 mmol/L), a decreased serum phosphorous (<3.0 or <0.97 mmol/L). Other values that may be reflective of a developing or chronic hypochlorhydria include increased or decreased gastrin (<50 or >100), an increased MCV (>90) and MCH (>31.9), a decreased or normal calcium (<9.2 or 2.30 mmol/L) and iron (<85 or 15.22 mmol/dL), a decreased chloride (<100), an increased anion gap (>12) and a decreased alkaline phosphatase (<70).

Liver damage/infections

Increased levels of total globulin (>2.8 or 28 g/L) are often seen in conditions such as hepatitis, fatty liver, or cirrhosis. The body produces increased levels of immunoglobulins in response to tissue and cellular damage, destruction, or infection. Rule out liver problem or infection SGPT/ALT, SGOT/AST, GGTP, and serum protein electrophoresis. Consider fatty liver in obese patients or those with elevated lipids. Rule out cirrhosis if elevated in conjunction with liver enzyme abnormalities.

Oxidative Stress and Free Radical Activity

Suspect excess free radical activity and oxidative stress if the total globulin level is increased. If the total globulin level is increased (>2.8 or 28 g/L) along with a total cholesterol level that is suddenly below its historical level and a decreased lymphocyte count (<20), a decreased albumin (<4.0 or 40 g/L) and a decreased platelet level (<150) free radical pathology, which increases the risk for developing a neoplasm, should be investigated. Oxidative stress can cause an increased destruction of red blood cells; in these situations you will see an elevated bilirubin level (>1.2 or 20.5 mmol/dL). Other tests include: Acid Phosphatase, serum protein Electrophoresis, CEA, Anti-malignin Antibody, HCG, Alpha Fetoprotein, etc. If Alpha 1, Alpha 2, or gamma globulins are increased on a serum protein electrophoresis, free radical pathology should be investigated immediately.

Heavy metal/ Chemical toxicity

Chronic levels of chemical and/or heavy metal toxicity can lead to an elevation in total globulins due to the persistent low-level tissue inflammation.

Immune Activation

The total globulin level constitutes the body's antibody system. It is composed of four fractions (alpha 1, alpha 2, beta and gamma globulin). An increased level of total globulins (>2.8 or 28 g/L) can therefore indicate an increase in one or more of these fractions that has been activated due to an infectious or inflammatory process. Many auto-immune conditions will first present with this pattern.

GLUCOSE - FASTING ↑

(89.71 mg/dL)

Insulin resistance (Early stage) and glucose intolerance

Research has shown that individuals progress through several stages of insulin resistance and glucose intolerance before becoming a classic type II diabetic. The stages include: Normal glucose tolerance hypoglycemia (often due to hyperinsulinemia) insulin insensitivity/resistance eventually overt type II diabetes. An increased fasting blood glucose level is a sign that this individual is possibly in an insulin resistant phase, also known as a pre-diabetic state.

Early stage of Hyperglycemia/Diabetes

If serum glucose and Hemoglobin A1C are both above optimal, diabetes is probable. Serum triglycerides are often higher than the total cholesterol in patients with diabetes. Urinary glucose may be increased, HDL levels decreased, and BUN and creatinine frequently increased with the renal damage associated with diabetes. Follow-up with appropriate testing to confirm the diagnosis, e.g. oral Glucose Insulin Tolerance Testing (GITT).

Metabolic Syndrome / insulin resistance

Metabolic Syndrome or hyperinsulinemia is a cluster of related symptoms: Increased triglycerides (>80 or >0.90 mmol/L), increased total cholesterol (>180 or 4.66 mmol/L), decreased HDL cholesterol (< 55 or < 1.42 mmol/L), obesity, increased blood insulin levels (>5 or 35.88), increased glucose (> 86 mg/dL or 4.77 mmol/L) and increased blood pressure. The hallmark of this syndrome is the insulin resistance that leads to high glucose levels and an imbalance in blood fats. The overall effect is an increased risk for cardiovascular disease and diabetes.

Thiamine (Vitamin B1) need

An increased glucose (> 86 mg/dL or 4.77 mmol/L) is associated with a thiamine need. Thiamine transports glucose across the blood brain barrier and is an essential component in the enzymatic conversion of pyruvate into acetyl CoA that allows pyruvate to enter the Kreb's cycle. If glucose is increased (> 86 mg/dL or 4.77 mmol/L) and the hemoglobin A1C is normal, thiamine need is possible. If CO2 is decreased (<25) and the anion gap is increased (>12) along with moderately high serum glucose (>86 or 4.77 mmol/L), thiamine need is probable. Due to thiamine's role in glycolysis, LDH levels may be decreased (<140).

Anterior Pituitary resistance to cortisol

During the decompensated/maladapted phase of the chronic stress response, the hypothalamus and pituitary become less and less sensitive to cortisol, causing increased cortisol resistance. The net result is an increase in cortisol levels in the body because the negative feedback loop that shuts cortisol production down is not activated. Increased levels of circulating cortisol will cause increased blood glucose levels through increased gluconeogenesis. Excess cortisol will also reduce the utilization and uptake of glucose by the cell.

Acute stress

Increasing levels of stress cause the body to move into the chronic stress response. This is marked by an increased Cortisol to DHEA ratio, which causes an increase in gluconeogenic activity and a concomitant rise in blood glucose levels. Excess cortisol will also reduce the utilization and uptake of glucose by the cell.

Fatty liver (early development) and Liver congestion

High blood glucose (>86 or 4.77 mmol/L) levels have been associated with increased levels of blood fats, e.g. high total cholesterol (>180 or 4.66 mmol/L), LDL (>100 or 2.59 mmol/L) and triglycerides (>80 or >0.90 mmol/L), low HDL (< 55 or < 1.42 mmol/L). In individuals with liver congestion, this may lead to the deposition of fat in the liver and the development of fatty liver.

HOMA2-%B ↑

(128.2 %)

Progression towards Pre-Diabetes and Insulin Resistance

In the initial stages of insulin resistance, where an increased level of insulin is required to respond to blood glucose levels, HOMA2-%B measurement will INCREASE, representing the increased activity of the beta cells, and the increased insulin being secreted.

Elevated HOMA2-%B measurements in addition to elevated HOMA2-IR measurements are indicative of pre-diabetes and dietary and lifestyle intervention should be initiated.

HOMA2-%S ↓

(65 %)

Increasing Levels of Insulin Resistance

Decreased HOMA2-%S is indicative of decreasing levels of insulin sensitivity by the peripheral tissue cells. This is commonly seen in pre-diabetes and type 2 diabetes. Loss of Insulin sensitivity and decreased HOMA2-%S measures are secondary to chronically elevated insulin levels, which is usually a result of elevated serum blood glucose levels. A decreased HOMA2-%S measure would be seen in conjunction with an elevated HOMA2-IR measure, and an elevated HOMA2-%B measurement in the pre-diabetes or perhaps early stages of T2DM.

Progressed Insulin resistance and Type 2 Diabetes

A decreasing HOMA2-%S in conjunction with a decreased HOMA2-%B measurement is a sign that the patient is progressing beyond pre-diabetes and early stage insulin resistance towards type 2 diabetes. The accompanying low HOMA2-%B is a sign that the disease has progressed to the point of beta-cell failure.

HOMA2-IR ↑

(1.53 Index)

Increasing Levels of Insulin Resistance

Elevated HOMA2-IR > 1.8 is of insulin resistance by the peripheral tissue cells. This is commonly seen in pre-diabetes and T2DM. Insulin resistance and elevated HOMA2-IR measures are secondary to elevated insulin levels, which is usually a result of elevated serum blood glucose levels. An elevated HOMA2-IR measure would be seen in conjunction with an elevated HOMA2-%B measurement in the pre-diabetes or perhaps early stages of T2DM, and would be seen in conjunction with a decreased HOMA2-%B measurement once the disease has progressed to the point of beta-cell failure.

Metabolic Syndrome

Elevated HOMA2-IR > 1.4 is a sign of metabolic syndrome.

Polycystic Ovarian Syndrome (PCOS)

Elevated HOMA2-IR is common in 60-75% of cases of PCOS.

HOMOCYSTEINE ↑

(7.3 µmol/L)

Increased Risk for Cardiovascular Disease

Hyperhomocysteinemia, a condition of increased homocysteine levels, is a risk factor for developing cardiovascular disease, arterial disease, stroke, and venous thrombosis. Homocysteine levels are affected by nutritional and genetic factors. Consider genetic testing for MTHFR gene mutations with elevated levels of homocysteine.

Additional diseases and pathological processes associated with an increased homocysteine

Colon cancer
Cervical cancer
Depression
Alzheimer's disease
Inflammatory bowel disease

INSULIN - FASTING ↑

(5.19 µIU/ml)

Elevated fasting insulin levels are associated with greater risks of heart attack, stroke, metabolic syndrome and diabetes.

Insulin resistance (Early stage) and glucose intolerance

Research has shown that individuals progress through several stages of insulin resistance and glucose intolerance before becoming a classic type II diabetic. The stages include: Normal glucose tolerance hypoglycemia (often due to hyperinsulinemia) insulin insensitivity/resistance eventually overt type II diabetes. An increased fasting blood glucose level is a sign that this individual is possibly in an insulin resistant phase, also known as a pre-diabetic state.

Early stage of Hyperglycemia/Diabetes

If fasting insulin is elevated along with an elevated serum glucose (> 86 mg/dL or 4.77 mmol/L) and Hemoglobin A1C (> 5.5% or 0.055) diabetes is probable. Serum triglycerides are often higher than the total cholesterol level in patients with diabetes. Urinary glucose may be increased, HDL levels decreased (< 55 or < 1.42 mmol/L), BUN (> 16 or 5.71 mmol/L) and creatinine (>1.1 or >97.2 mmol/dL) frequently increased with the renal damage associated with diabetes. Follow-up with appropriate testing to confirm the diagnosis, e.g. oral Glucose Insulin Tolerance Testing (GITT).

Metabolic Syndrome / insulin resistance

Metabolic Syndrome or hyperinsulinemia is a cluster of related symptoms: Increased triglycerides (>80 or >0.90 mmol/L), increased total cholesterol (>180 or 4.66 mmol/L), decreased HDL cholesterol (< 55 or < 1.42 mmol/L), obesity, increased blood insulin levels (>5 or 35.88), increased glucose (> 86 mg/dL or 4.77 mmol/L) and increased blood pressure. Fasting insulin may also be elevated. The hallmark of this syndrome is the insulin resistance that leads to high glucose levels, high insulin levels and an imbalance in blood fats. The overall effect is an increased risk for cardiovascular disease and diabetes.

Insulinoma (pancreatic islet tumor)

A pancreatic islet tumor can cause levels of insulin to rise high. If you see hyperinsulinemia with hypoglycemia (blood glucose levels lower than 30 mg/dL or lower than 1.66 mmol/L) then refer patient to an endocrinologist for further investigation.

IRON - SERUM ↓

(77.93 µg/dL)

Anemia- iron deficiency

This is the most prevalent anemia worldwide. The major causes are: Dietary inadequacies, Malabsorption, Increased iron loss, Increased iron requirements e.g. pregnancy. If there is a decreased serum iron (< 85 or 15.22 mmol/dL) with a decreased MCH (<28), MCV (<82), and MCHC (<32), ferritin (<33 in men and 10 in women), % transferrin saturation and/or HGB (<13.5 or 135 g/L in women and <14 or 140 in men) and/or HCT (<37 or 0.37 in women and 40 or 0.4 in men), and increased RDW (>13), then iron deficiency anemia is **probable**. If TIBC is increased (>350 or 62.7 mmol/dL), internal/microscopic bleeding is **possible**, and should be ruled out with reticulocyte count, urinalysis, and/or stool analysis. If serum phosphorous is decreased (<3.0 or <0.97 mmol/L) and serum globulin is increased (>2.8 or 28 g/L) or decreased (<2.4 or 24 g/L), iron anemia may be **secondary to hypochlorhydria.**

Hypochlorhydria

A low serum iron level is often associated with hypochlorhydria. Adequate levels of stomach acid are necessary for iron absorption. Hypochlorhydria is **possible** with a low serum iron (< 85 or 15.22 mmol/dL) and an increased (> 2.8 or 28 g/L) or decreased (<2.4 or 24 g/L) total globulin. Hypochlorhydria is **probable** if the BUN is also increased (>16 or 5.71 mmol/L) and/or serum phosphorous is decreased (<3.0 or <0.97 mmol/L).

Internal bleeding and internal microscopic bleeding

A decreased total serum iron (< 85 or 15.22 mmol/dL) may be due to internal bleeding. TIBC (>350 or 62.7 mmol/dL), transferrin, and reticulocyte count (>1) will be elevated. HGB (<13.5 or 135 g/L in women and <14 or 140 in men) and HCT (<37 or 0.37 in women and 40 or 0.4 in men) may be decreased or normal depending on the severity of the bleeding. Internal microscopic bleeding may present with a decreased TIBC (<250 or 44.8 mmol/dL) and an elevated reticulocyte count. If this pattern is present, internal bleeding must be ruled out with reticulocyte count, urinalysis, and/or stool analysis. **Refer to a doctor qualified to diagnose and treat internal bleeding.**

LDH ↓

(131 IU/L)

Reactive Hypoglycemia

A common finding in reactive hypoglycemia is a decreased fasting blood glucose along with a decreased LDH (<140). Hemoglobin A1C levels may also be reduced (<4.5% or 0.045). LDH is an important enzyme for pyruvate metabolism in glycolysis and is associated with pancreatic function and glucose metabolism.

LDL CHOLESTEROL ↑

(121.42 mg/dL)

Metabolic Syndrome /hyperinsulinemia

If LDL levels are increased (>100 or 2.59 mmol/L), triglycerides are increased (> 80 or 0.90 mmol/L) with decreased HDL cholesterol (< 55 or < 1.42 mmol/L), and increased fasting blood glucose (> 86 mg/dL or 4.77 mmol/L), then metabolic syndrome and hyperinsulinemia is **probable**. Metabolic Syndrome can lead to adrenal dysregulation, so adrenal hyperfunctioning should be ruled out.

Increased risk of atherosclerosis, cardiovascular risk and stroke

An increased LDL level is associated with the development of atherosclerosis and an increased risk for cardiovascular disease and stroke. If there is an increased triglyceride level (>80 or 0.90 mmol/L) in relation to total cholesterol (>180 or 4.66 mmol/L) with an increased uric acid level (>5.9 or > 351 mmol/dL), a decreased HDL (< 45 or < 1.16 mmol/L) and an increased LDL (>100 or 2.59 mmol/L), atherosclerosis is **probable**. Platelet levels may also be increased (>385). Homocysteine levels are frequently increased > 7.2 with atherosclerosis. Hs-CRP are frequently >0.55 in men and >1.5 in women, and fibrinogen levels are frequently increased above 300. Diabetes and thyroid hypofunction should also be considered with this pattern.

Hyperlipidemia

Increased LDL cholesterol and total cholesterol levels are associated with hyperlipidemia, which has been shown to indicate a potential risk of developing atherosclerotic coronary artery disease. If LDL is increased (>100 or 2.59 mmol/L) with an increased total cholesterol (>180 or 4.66 mmol/L) and an increased LDL/HDL ratio and an increased level of triglycerides (>80 or >0.90 mmol/L) with HDL less than 25% of the total cholesterol, hyperlipidemia is **probable**.

Oxidative stress

Increased LDL levels are associated with increasing free radical activity and oxidative stress. The peroxidation of LDL may promote the accumulation of cholesterol in the macrophages and smooth muscle cells, which can lead to atherosclerotic plaque formation.

Fatty liver (early development) and Liver congestion

If LDL levels are increased, along with increased triglyceride and total cholesterol levels, and HDL levels are decreased, the early development of fatty liver is possible. Liver congestion, due to the fatty liver, should be considered if total cholesterol is above 180 or 4.99 mmol/L, triglycerides are increased (>80 or >0.90 mmol/L), and the SGPT/ALT is below 10.

Diet- high in refined carbohydrates

The Standard American Diet (SAD), which is very high in refined carbohydrates, can contribute to increased LDL.

MAGNESIUM - RBC ↓

(5.77 mg/dl)

Magnesium Deficiency

Consider that the patient has a need for magnesium if the RBC and Serum Magnesium level is decreased.

Muscle Spasm

The laboratory results with muscle spasm are variable; however, decreased serum or RBC magnesium is a common finding.

MAGNESIUM - SERUM ↓

(2.05 mg/dl)

Muscle Spasm

The laboratory results with muscle spasm are variable; however, decreased serum or RBC magnesium is a common finding.

MCV ↑

(90.4 fL)

Anemia- Vitamin B12 and/or Folate deficiency

B12 and folate are needed for proper nucleus development. In situations of deficiency the cytoplasm of the erythrocyte continues to expand until the nucleus has reached its proper size. This leads to large red blood cells. The probability of vitamin B-12 or folate deficiency anemia increases when the MCV is increased (>90) and the MCH is above 31.9. If there is also an increased RDW (>13), MCHC (>35), and LDH (>200) (especially the LDH-1 isoenzyme fraction), and a decreased uric acid level the probability of vitamin B-12 or folic acid anemia is very high. Serum or urinary methylmalonic acid is a good test for confirming vitamin B-12 deficiency. An elevated serum homocysteine (>7.2) can help confirm folic acid and vitamin B-6 deficiency. The presence of hypersegmented neutrophils (5 or more lobes in more than 5% of all neutrophils) has been reported to be more sensitive and reliable than an elevated MCV in detecting megaloblastic anemia and is not affected by coexisting iron deficiency.

Hypochlorhydria

Hypochlorhydria is possible with an increased MCV, MCHC and/or MCH, especially with a low serum iron and an increased (>2.8 or 28 g/L) or decreased (<2.4 or 24 g/L) total globulin. Hypochlorhydria is probable if BUN is increased (>16 or 5.71 mmol/L) and/or serum phosphorous is decreased (<3.0 or 0.97 mmol/L).

Vitamin C need

Consider a vitamin C need if there's a decreased albumin (<4.0 or 40g/L) along a decreased HCT (<37 or 0.37 in women and 40 or 0.4 in men), HGB (<13.5 or 135 g/L in women and <14 or 140 in men), MCH (<28), MCHC (<32), serum iron (< 85 or 15.22 mmol/dL). There also may be an increased MCV (>89.9), alkaline phosphatase (>100), fibrinogen (>300) and RBCs (>4.5 in women and >4.9 in men).

METHYLMALONIC ACID ↑

(278.2 nmol/L)

B12 deficiency

An elevated MMA level above 260 nmol/L is considered an indicator for vitamin B12 deficiency. An elevated MMA along with an elevated homocysteine is a strong indication that B12 deficiency is present. If both MMA and homocysteine are normal then a B12 deficiency is unlikely.

Risk factors for vitamin B12 deficiency include advanced age, hypochlorhydria, gastrointestinal surgery (gastric or ileal), malabsorption, and long-term adherence to a vegan or vegetarian diet.

The early detection and resolution of B12 deficiency can help prevent its associated advanced central nervous system impairment.

Renal insufficiency

An impaired renal function may lead to a build-up of MMA due to decreased excretion.

Small intestine bacterial overgrowth (SIBO)

Bacterial overgrowth in the small intestine may contribute to elevated methylmalonic acid.

MONOCYTES - % ↑

(8.2 %)

Recovery phase of acute infection

Due to their phagocytic function monocytes are often the white blood cell that removes the bacterial, viral, and cellular residue of infection. It is a positive sign to see an increase in Monocytes - % as high as 7% and an increased Monocytes - Absolute count as high as 0.58 towards the end of an infection.

Liver dysfunction

Not a primary marker but if an increased Monocyte - Absolute count (>0.58) and/or an increased Monocyte - % (>7%) is seen it is a good idea to rule out liver dysfunction. Functionally oriented liver problems, such as detoxification issues, liver congestion, and conjugation problems are extremely common and should be evaluated based on early prognostic indicators. The liver should always be viewed in the context of the hepato-biliary tree.

Intestinal parasites

If the Monocyte - Absolute count is elevated (>0.58) and/or the Monocyte - % is elevated (>7%) with increased Eosinophils - % (>3%), increased Eosinophils - Absolute count (>0.4), increased Basophils - % (>1%) and increased Basophils - Absolute count (>0.1), then intestinal parasites are **possible**. Further investigation is warranted, i.e. a digestive stool analysis with ova and parasite, especially if the subjective indicators are present. In some cases the stool tests may be normal especially with amoebic parasites or if the lab sample was not collected or analyzed appropriately by a qualified lab. Multiple and/or purged samples are sometimes necessary.

Males

Urinary Tract Congestion: Benign Prostatic Hypertrophy (BPH)

An increased Monocytes- Absolute count (>0.58) and/or an increased Monocytes- % (>7%) may be associated with prostatic hypertrophy, especially If the serum creatinine is elevated (>1.1 or 97.2 mmol/dL) in a male over 40 years old. Often the creatinine will increase long before the PSA increases. Suspect BPH if there is an increased creatinine level (>1.1 or 97.2 mmol/dL, along with a normal BUN and electrolytes. The likelihood of BPH increases when there is an increased creatinine level (>1.1 or 97.2 mmol/dL, along with a normal BUN and electrolytes, and an increased Monocytes- Absolute count (>0.58) and an increased Monocytes- % (>7%) and LDH isoenzyme #4, which has a prostatic origin. **If BPH is suspected the following may be indicated**: a microscopic examination of the urine for prostate cells, a urinalysis indicating infection, and a manual examination of the prostate.

MPV ↑

(11.2 fL)

An elevated MPV is seen in:

Conditions that cause the destruction of platelets: Inflammatory Bowel Disease, Idiopathic thrombocytopenic purpura (autoimmune) and myeloproliferative disorders
Immune thrombocytopenia
Acute and Chronic Myeloid Leukemia
Megaloblastic anemia
Other anemias: hemolytic, pernicious

MPV has been shown to increase prior to an acute Myocardial infarction.

NEUTROPHIL : LYMPHOCYTE ↓

(1.01 Ratio)

Viral Infection

A low NLR may be indicative of a viral infection, whereas an elevated NLR suggests a bacterial infection in affected individuals.

NEUTROPHILS - ABSOLUTE ↓

(1.87 k/cumm)

Blood diseases

Anything that affects the output of white blood cells from the bone marrow can cause a decreased Neutrophil - Absolute and Neutrophils - % (aplastic anemia, pernicious anemia, acute lymphoblastic leukemia)

Chronic viral infection

A chronic viral infection is possible with a decreased Neutrophils - % (<40%), a decreased Neutrophils - Absolute (<1.9), an increased Lymphocytes - % (>44%), an increased Lymphocytes - Absolute (>3.1) and/or a decreased total WBC count (<5.0).

NON-HDL CHOLESTEROL ↑

(146.33 mg/dl)

Increased risk of cardiovascular disease and related events

An elevated non-HDL cholesterol is indicative of a relative increase in atherogenic lipoproteins and increased risk of oxidative damage and atherosclerosis.

Non-HDL cholesterol was found to be the best of all cardiac measures for predicting risk of coronary artery disease events and stroke.

Increased small, dense LDL cholesterol

An increase in non-HDL cholesterol may reflect an increase in atherogenic small, dense LDL cholesterol (sdLDL-C). This is the type of cholesterol most likely to become oxidized, and to infiltrate and damage blood vessels.

Non-alcoholic fatty liver disease (NAFLD)

Elevated non-HDL-C is observed in non-alcoholic fatty liver disease. Further assessment of disease progression can be achieved by calculating non-HDL-C/HDL-C ratio, as well as assessing LDL cholesterol in those with normal triglyceride levels.

Metabolic imbalance

Elevated non-HDL cholesterol levels are associated with diabetes, metabolic syndrome, obesity, and hypothyroidism.

Smoking

Smokers are found to have lower HDL levels which then can cause a relative increase in non-HDL cholesterol levels.

Unhealthy lifestyle and diet

An elevated non-HDL cholesterol level may be related to lack of exercise/activity as well as an unhealthy diet high in total calories, trans fats, unhealthy saturated fats, and excess sugar and refined carbohydrates.

Vitamin D insufficiency or deficiency

Non-HDL cholesterol levels may be inversely related to vitamin D levels. Vitamin D is believed to be cardioprotective.

PHOSPHORUS ↓

(2.88 mg/dL)

Parathyroid Hyperfunction

Parathyroid hyperfunction will cause an increase in PTH levels, which can lead to a decreased serum phosphorous. If the serum phosphorous is decreased (<3.0 or <0.97 mmol/L) and the calcium is significantly increased (>10.5 or 2.63 mmol/L) parathyroid hyperfunction is **possible**. Alkaline phosphatase levels may also be increased (>100), along with a normal or decreased serum or RBC magnesium. Follow up with a serum parathyroid hormone test. If parathyroid hormone levels are also increased presume clinical hyperparathyroidism exists. Hyperparathyroidism may be due to space-occupying lesions on one or more of the glands. Surgical removal may be necessary to determine if there is a neoplasm. A patient with increased serum calcium and an increased PTH should be checked by an endocrinologist, as hyperparathyroidism is a serious condition.

Hypochlorhydria

A decreased serum phosphorous is associated with a decreased production of hydrochloric acid in the stomach (hypochlorhydria). Hypochlorhydria is **possible** with a decreased serum phosphorous (<3.0 or <0.97 mmol/L) and an increased or decreased globulin level (< 2.4 / 24 g/L or >2.8 / 28 g/L) and a normal or decreased total protein (<6.9 or 69 g/L). If the BUN is also increased (>16 or 5.71 mmol/L), hypochlorhydria is highly **probable**.

Other values that may be reflective of a developing or chronic hypochlorhydria include increased or decreased gastrin (<50 or >100), an increased MCV (>90) and MCH (>31.9), a decreased or normal calcium (<9.2 or 2.30 mmol/L) and iron (< 85 or 15.22 mmol/dL), a decreased chloride (<100), an increased anion gap (>12) and a decreased alkaline phosphatase (<70).

Hyperinsulinism

Phosphate crosses the cell membrane with glucose. Hyperinsulinism, therefore, will cause an increased uptake of glucose by the cells and will also increase phosphorous uptake, possibly contributing to a decreased serum phosphorous level (<3.0 or 0.97 mmol/L).

Diet- high in refined carbohydrates

Phosphate crosses the cell membrane with glucose. Plasma levels may be decreased (<3.0 or 0.97 mmol/L) after a meal high in refined carbohydrates. A diet high in refined carbohydrates and sugars will deplete phosphorous stores and other important co-factors for carbohydrate metabolism.

PLATELETS ↓

(217 10E3/µL)

Infections

Some viral, rickettsial, and bacterial infections can cause a decreased platelet count.

Idiopathic Thrombocytopenia

A hemorrhagic disease that is often triggered by a viral disease in children and has symptoms of purpura, increased platelet destruction, petechiae, mucosal bleeding, and thrombocytopenia. This is not something that you are likely to see in general practice.

Heavy metals

Blood platelets may be low when the body is dealing with an increased heavy metal load. Check for decreased MCH, MCHC, and LDH Isoenzyme #5. If either is decreased, along with a decreased platelet count, suspect a heavy metal body burden and consider hair analysis or toxic element testing via blood or urine.

Oxidative Stress and Free Radical Activity

Suspect excess free radical activity and oxidative stress if the platelet level is decreased. If the platelet level is decreased along with a total cholesterol level that is suddenly below its historical and a decreased lymphocyte count, a decreased albumin, and an increased total globulin and uric acid level, free radical pathology, increases the risk of developing a neoplasm, should be investigated.

Purpura and petechiae

The platelet count may be low in these conditions. People who bruise easily often have low vascular and capillary integrity. A low platelet count can exacerbate such a condition.

PROGESTERONE - MALE ↓

(0.64 ng/ml)

Estrogen Dominance

A low serum progesterone may be an indication of estrogen dominance. Suspect this if you see a low progesterone and an increased estradiol level in your male patients.

Low Pregnenolone

Given that progesterone in males is produced primarily from pregnenolone in the adrenal glands, low pregnenolone levels may be a contributing factor for low progesterone in males.

PROTEIN - TOTAL ↓

(6.86 g/dL)

Hypochlorhydria

A decreased or normal total protein level is often associated with a decreased production of hydrochloric acid in the stomach (Hypochlorhydria). Hypochlorhydria is **possible** with an increased globulin level (>2.8 or 28 g/L) and a normal or decreased total protein (6.9 or 69 g/L) and/or albumin (< 4.0 or 40 g/L). Hypochlorhydria is **probable** if globulin levels are increased (>2.8 or 28 g/L) along with an increased BUN (>16 or 5.71 mmol/L), a decreased or normal total protein (6.9 or 69 g/L) and/or albumin (<4.0 or 40 g/L), and/or decreased serum phosphorous (<3.0 or <0.97 mmol/L). Other values that may be reflective of a developing or chronic hypochlorhydria include increased or decreased gastrin (<50 or >100), an increased MCV (>90) and MCH (>31.9), a decreased or normal calcium (<9.2 or 2.30 mmol/L) and a decreased iron (<85 or 15.22 mmol/dL), a decreased CO2 (<25), an increased anion gap (>12) and a decreased alkaline phosphatase (<70)

Digestive dysfunction/ inflammation

Suspect primary digestive inflammation or inflammation secondary to HCL insufficiency with a low total protein (6.9 or 69 g/L). This pattern will be similar to that of Hypochlorhydria but the globulin may be decreased (< 2.4 or 24 g/L) unless inflammation is severe.Decreased total globulin (<2.4 or 24 g/L), decreased serum phosphorous (<3.0 or 0.97 mmol/L) , increased BUN (>16 or 5.71 mmol/L) , basophils (>1) and ESR.

Liver dysfunction

Dysfunction in the liver will have a great impact on protein production and synthesis, which will affect total serum protein levels. Therefore, a decreased total serum protein level (<6.9 or 69 g/L) may be indicative of a liver dysfunction. Functionally oriented liver problems, such as detoxification issues, liver congestion, and conjugation problems are extremely common and should be evaluated based upon early prognostic indicators. The liver should always be viewed in the context of the hepato-biliary tree. Some of the key clinical indicators include:

1. Pain between shoulder blades
2. Stomach upset by greasy foods
3. If drinking alcohol, easily intoxicated
4. Headache over the eye
5. Sensitive to chemicals (perfume, cleaning solvents, insecticides, exhaust, etc.)
6. Hemorrhoids or varicose veins

Diet- Low Protein/ Protein Deficiency/ Malnutrition/ Amino Acid Need

Protein digestion is dependent on an optimal pH in the stomach. A decreased total protein (<6.9 or 69 g/L) can be an indicator for digestive dysfunction, which will greatly compromise protein digestion and absorption. Protein malnutrition is due primarily to the lack of available essential amino acids from the diet.

QUICKI ↓

(0.37 Index)

Decreased Levels Associated with:

Insulin resistance
Metabolic syndrome
Non Alcoholic Fatty Liver Disease (NAFLD)
Diabetes
Obesity

SEX HORMONE BINDING GLOBULIN - MALE ↑

(42 nmol/L)

Elevated SHBG levels in the blood cause too much testosterone to be bound thus it becomes less available to do its functional work in the body. What's the net result of this?

Some men with too much SHBG think they have normal total testosterone levels because much of the testosterone in the

body is bound up and thus functionally unavailable to healthy tissues. Only about 0.55-2% of all testosterone is in the free form the rest is bound to albumin or SHBG. This improper assessment of the real testosterone picture leads to men walking around with deficient testosterone that is not diagnosed. Many of these men also have high estradiol levels that are unopposed by the testosterone leading to feminization symptoms: gynecomastia (the development of fatty breast tissue in men), diminished libido and poor sexual performance, cognitive decline, and chronic fatigue.

SODIUM : POTASSIUM ↓

(29.57 ratio)

Chronic Stress, Adrenal Fatigue and Adrenal Insufficiency

A decreased sodium:potassium ratio is an indication of chronic stress, adrenal fatigue and adrenal insufficiency. Chronic stress weakens the adrenal glands and causes a decrease in adrenal activity and a decrease in aldosterone output. Low aldosterone causes sodium to be excreted by the body (hence the low serum sodium) and causes the potassium to be retained thus increasing the serum potassium levels. The net effect is a decreased sodium:potassium ratio.

A catabolism indicator

A decreased sodium:potassium ratio is an indication of a higher cortisol output than aldosterone output. Cortisol is a hormone associated with tissue breakdown and catabolism. A decreased sodium:potassium ratio is an indication of catabolism, i.e. the body may be breaking down tissue faster than it is regenerating it.

TESTOSTERONE BIOAVAILABLE - MALE ↓

(280.93 ng/dl)

Low Bioavailable Testosterone levels in men are associated with the following:

- Metabolic Syndrome
- Diabetes
- Alzheimer's disease
- Increased risk of stroke
- Increased cardiovascular disease risk
- Diminished libido
- Erectile dysfunction
- Loss of muscle tone
- Increased abdominal fat
- Low bone density
- Depression

TESTOSTERONE FREE - MALE ↓

(127.43 pg/ml)

Low Free Testosterone levels in men are associated with the following:

- Metabolic Syndrome
- Diabetes
- Alzheimer's disease
- Increased risk of stroke
- Increased cardiovascular disease risk
- Diminished libido
- Erectile dysfunction
- Loss of muscle tone
- Increased abdominal fat
- Low bone density
- Depression

TESTOSTERONE TOTAL - MALE ↓

(649.55 ng/dl)

Low Total Testosterone levels in men are associated with the following:

- Metabolic Syndrome
- Diabetes
- Alzheimer's disease
- Increased risk of stroke
- Increased cardiovascualr disease risk
- Diminshed libido
- Erectile dysfunction
- Loss of muscle tone
- Increased abdominal fat
- Low bone density
- Depression

TOTAL WBCS ↓

(4.3 k/cumm)

Chronic viral infection

In a chronic viral infection the total WBC count will be decreased (<5.5), as the body is using up its WBCs. Decreased total WBC (<5.5), increased lymphocyte count (>44), decreased neutrophils (<40), decreased LDH isoenzymes due to a decrease in the total WBC and an increased monocytes (>7) during the recovery phase.

Chronic bacterial infection

The total WBC count in a chronic bacterial infection will often be opposite of that seen with active infection: Decreased total WBC (<5.5), increased neutrophils (>60), decreased lymphocyte count (<24), and decreased LDH isoenzymes due to a decrease in the total WBC. Expect to see an increased monocyte count (>7) during the recovery phase.

Pancreatic insufficiency

The body responds to pancreatic insufficiency by using phagocytic white cells to do the job of breaking down food and clearing food residue from the system. This is known as leukocytic auto digestion and can cause a decreased white count (<5.5).

Systemic Lupus Erythematosis (SLE)

SLE is a disease characterized by inflammation in several organ systems and the production of auto-antibodies that cause cellular injury. It is a disease of extreme variability in clinical and laboratory presentation. Nearly half of all people suffering from SLE have leukopenia, and anemia is usually present in the active disease. SLE is possible with decreased WBC count (<5.5) and C-complement, and an increased ANA, Alpha 1 globulin, C reactive protein, and gamma globulin.

Decreased production

If the following chemistries are out of range we can suspect a functional decreased production from the bone marrow: Decreased total WBC (<5.5), RBCs (<3.9 in women or 4.2 in men), cholesterol (<150 or 3.9 mmol/L), magnesium, and BUN (<10 or 3.57 mmol/L) with an increased MCV (>89.9). Certain drugs, chemotherapeutic agents, radiation, and heavy metals can cause bone marrow depression.

Raw food diet

The total WBC (<5.5) will frequently be slightly below the optimum range for patients on a diet high in raw foods.

TRIGLYCERIDES ↑

(94.77 mg/dL)

Metabolic Syndrome /hyperinsulinemia/early stage diabetes

If triglycerides are increased above the total cholesterol level with increased LDL cholesterol (>100 or 2.59 mmol/L), a decreased HDL (< 55 or < 1.42 mmol/L), and increased fasting blood glucose (> 86 mg/dL or 4.77 mmol/L), then metabolic syndrome and hyperinsulinemia is probable. Metabolic Syndrome can lead to adrenal dysregulation, so adrenal hyperfunctioning should be ruled out. Elevated triglycerides are seen in patients with diabetes. The triglycerides are often higher than the total cholesterol level. Lipid metabolism problems are a hallmark of the early stages of diabetes.

Fatty liver and Liver congestion

Increased triglycerides are associated with liver congestion and the early development of fatty liver (steatosis). If total cholesterol (>180 or 4.66 mmol/L), LDL (>100 or 2.59 mmol/L) and triglyceride levels (>80 or >0.90 mmol/L) are increased, and HDL levels are decreased (< 55 or < 1.42 mmol/L), then the early development of fatty liver is possible. Liver congestion, due to the fatty liver, should be considered if total cholesterol is above 180, triglycerides are increased (>80 or >0.90 mmol/L), and the SGPT/ALT is below 10.

Early stage of insulin resistance

Elevated triglycerides often accompany the elevated glucose levels that are seen in hyperinsulinism and insulin resistance.

Increased risk of cardiovascular disease, stroke and atherosclerosis

An increased triglyceride level is associated with the development of atherosclerosis and an increase in cardiovascular risk and stroke. Atherosclerosis is probable with an increased triglyceride level (>80 or 0.90 mmol/L) in relation to total cholesterol (>180 or 4.66 mmol/L) with an increased uric acid level (>5.9 or > 351 mmol/dL), a decreased HDL (< 45 or < 1.16 mmol/L) and an increased LDL (>100 or 2.59 mmol/L). Platelet levels may also be increased (>385). Homocysteine levels are frequently increased > 7.2 with atherosclerosis. Hs-CRP are frequently >0.55 in men and >1.5 in women, and fibrinogen levels are frequently increased above 300. Diabetes and thyroid hypofunction should also be considered with this pattern.

Poor metabolism and utilization of fats

This is often the case in patients that are eating an optimal diet and have elevated triglyceride and cholesterol levels.

Hypothyroidism

Primary hypothyroidism is possible if the triglycerides and cholesterol levels are increased along with an increased TSH >2.0. Consider Secondary Hypothyroidism if the TSH is decreased (<1.3).

Hyperlipoproteinemia

Lipoprotein disorders usually present with elevated total cholesterol and triglyceride levels. There are 6 distinctive sub-types of these disorders, which are mostly genetic in nature. The lipid electrophoresis is one of the bests methods for determining the various metabolic problems associated with hyperlipoproteinemia.

Alcoholism

Alcohol is extremely calorie dense. Regular alcohol consumption and alcoholism can lead to significantly elevated levels of triglycerides in the blood. This is often accompanied by a greatly increased GGTP.

VITAMIN B12 ↓

(426.99 pg/ml)

Insufficient B12 Intake

Dietary deficiency of folate or B12 is uncommon in the U.S. It sometimes may be seen with general malnutrition and in vegans who do not consume any animal products, including milk and eggs.

Malabsorption

You may see B12 deficiency with conditions that interfere with the normal absorption of B12 in the GI. These include: Celiac disease, SIBO (Small Intesting Bacterial Overgrowth), parasites, hypochlorhydria, acid blocking medication, gastric bypass surgery, pacreatic insufficiency.

VLDL CHOLESTEROL ↑

(15.08 mg/dl)

Increased risk of heart disease and stroke

An increased VLDL level is associated with an increased risk of heart disease and stroke.

ZINC - RBC ↓

(9.09 mg/L)

Inadequate zinc intake/absorption/deficiency

Decreased intake and absorption will lead to zinc depletion and reduced RBC zinc. Levels decline more gradually with marginal insufficiency. Zinc absorption may be decreased when consumed with iron, magnesium, calcium, phytates, oxalates. Excess copper levels will reduce zinc absorption and retention. The heavy metal cadmium can also inhibit zinc absorption. When zinc intake and total body content decreases, the plasma, bone, liver, and testes will lose proportionately more zinc than other tissues such as the heart, skin, and skeletal muscle.

Hypochlorhydria

Zinc is part of the carbonic anhydrase enzyme which facilitates production of hydrochloric acid in the stomach. Low zinc levels and zinc deficiency are associated with decreased activity of the carbonic anhydrase enzyme, resulting in alterations in oxygen and carbon dioxide metabolism and hydrochloric acid production.

Immune Compromise

Zinc deficiency will negatively affect immunity and increase susceptibility to pathogenic infection.

Maldigestion and malabsorption

Zinc deficiency can contribute to impaired protein digestion and contribute to gastrointestinal symptoms such as diarrhea. Zinc absorption can be reduced when bound to phytates in whole grains.

Hyperlipidemia

Low RBC zinc is associated with increased blood levels of cholesterol and triglycerides.

Inflammatory process

The body will decrease serum zinc and increase serum copper during inflammation or an acute phase of disease. Zinc helps control oxidative stress, regulates inflammatory cytokines, and targets pro-inflammatory NF-kappaB. A deficiency of zinc contributes to increased inflammation and tissue damage.

Metabolic syndrome

Zinc has a pivotal role in insulin metabolism and its association with metabolic syndrome is being researched. Current results suggest that low serum zinc is associated with increased fasting insulin and the association becomes stronger as the number of metabolic syndrome risk factors increases.

Thyroid Disease

RBC zinc may be decreased in hyperthyroidism (i.e. Graves' disease) even if serum levels are within normal limits. Levels may be reduced in hypothyroidism but not to the same degree as in hyperthyroidism.

Antioxidant insufficiency

Low RBC zinc associated with reduced levels of RBC copper-zinc superoxide dismutase which in turn can reduce antioxidant activity within the cell.

ZINC - SERUM ↓

(76.13 ug/dL)

Inadequate zinc intake/absorption/deficiency

Serum zinc levels decrease quickly with severe zinc deficiency due to inadequate intake. Levels decline more gradually with marginal insufficiency. Zinc absorption may be decreased when consumed with iron, magnesium, calcium, phytates, oxalates. The heavy metal cadmium can also inhibit zinc absorption. When zinc intake and total body content decreases, the plasma, bone, liver, and testes will lose proportionately more zinc than other tissues such as the heart, skin, and skeletal muscle.

Hypochlorhydria

Zinc is part of the carbonic anhydrase enzyme which facilitates production of hydrochloric acid in the stomach. Low serum zinc and zinc deficiency are associated with decreased activity of the carbonic anhydrase enzyme, resulting in alterations in oxygen and carbon dioxide metabolism and hydrochloric acid production.

Increased Copper to zinc ratio

As zinc decreases in the serum, the copper to zinc ratio is altered. An elevation in copper to zinc ratio, especially above 2, is associated with inflammation, advanced disease or debilitation, increased CVD risk, malignancy, and a decreased ability to recover or regain homeostasis after a destabilizing event.

Hypogeusia

A noticeable sign of zinc deficiency is a decreased sense of taste and smell

Inflammatory process

The body will decrease serum zinc and increase serum copper during inflammation or an acute phase of disease. This, in turn, alters the copper to zinc ratio (CZr). A copper to zinc ratio above 2 may reflect an inflammatory process, especially if zinc intake and absorption are normal.

Metabolic syndrome

Zinc has a pivotal role in insulin metabolism and its association with metabolic syndrome is being researched. Current results suggest that low serum zinc is associated with increased fasting insulin and the association becomes stronger as the number of metabolic syndrome risk factors increases.

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