ODX | OptimalDX

Blood Chemistry Analysis

Functional Health Report

Practitioner Report

Prepared for	James Bond 50 year old male born Jan 26, 1968
Requested by	Dr. Dicken Weatherby Optimal DX
Test date	Aug 14, 2018

What's Inside?

An introduction to functional blood chemistry anaysis and your report.

Your view into your client's health through 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

Your view into the top areas that need the most attention.

Additional notes and information pertinent to this report.

SECTION 4: HEALTH IMPROVEMENT PLAN

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An introduction to functional blood chemistry anaysis and your report.

Introduction

Dr. Dicken Weatherby's Report

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

REPORT

Functional Blood Chemistry Analysis

Functional Blood Chemistry Analysis can be defined as the process by which complex and comprehensive blood biomarkers are organized, analyzed and interpreted to provide a comprehensive assessment of the state and trends of the main body systems, the supporting body accessory systems, along with the status of nutrients and trends towards and away from clinical dysfunction.

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, many people start to feel unwell long before a traditional blood test becomes diagnostic and 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 and not on whether a certain value represents good health or optimal physiological function. The problem is that "normal" reference ranges usually 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 that are based on optimal physiology and not the "normal" population. This results in a tighter "Functional Physiological Range", which allows us to evaluate the area within the "Normal" range that indicates that something is not quite right in the physiological systems associated with this biomarker. This gives us the ability to detect 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. DICKEN WEATHERBY
Naturopathy Practitioner

THE FUNCTIONAL HEALTH REPORT

The Functional Health Report uniquely organises 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 Body Systems and Accessory Reports show the level of dysfunction that exists in the various physiological and supporting accessory 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 IMPROVEMENT PLAN

All the information on the Assessment and Analysis sections of the report are summarized in the Health Improvement 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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Your view into your client's health through an in-depth functional system and nutrient evaluation.

Assessment

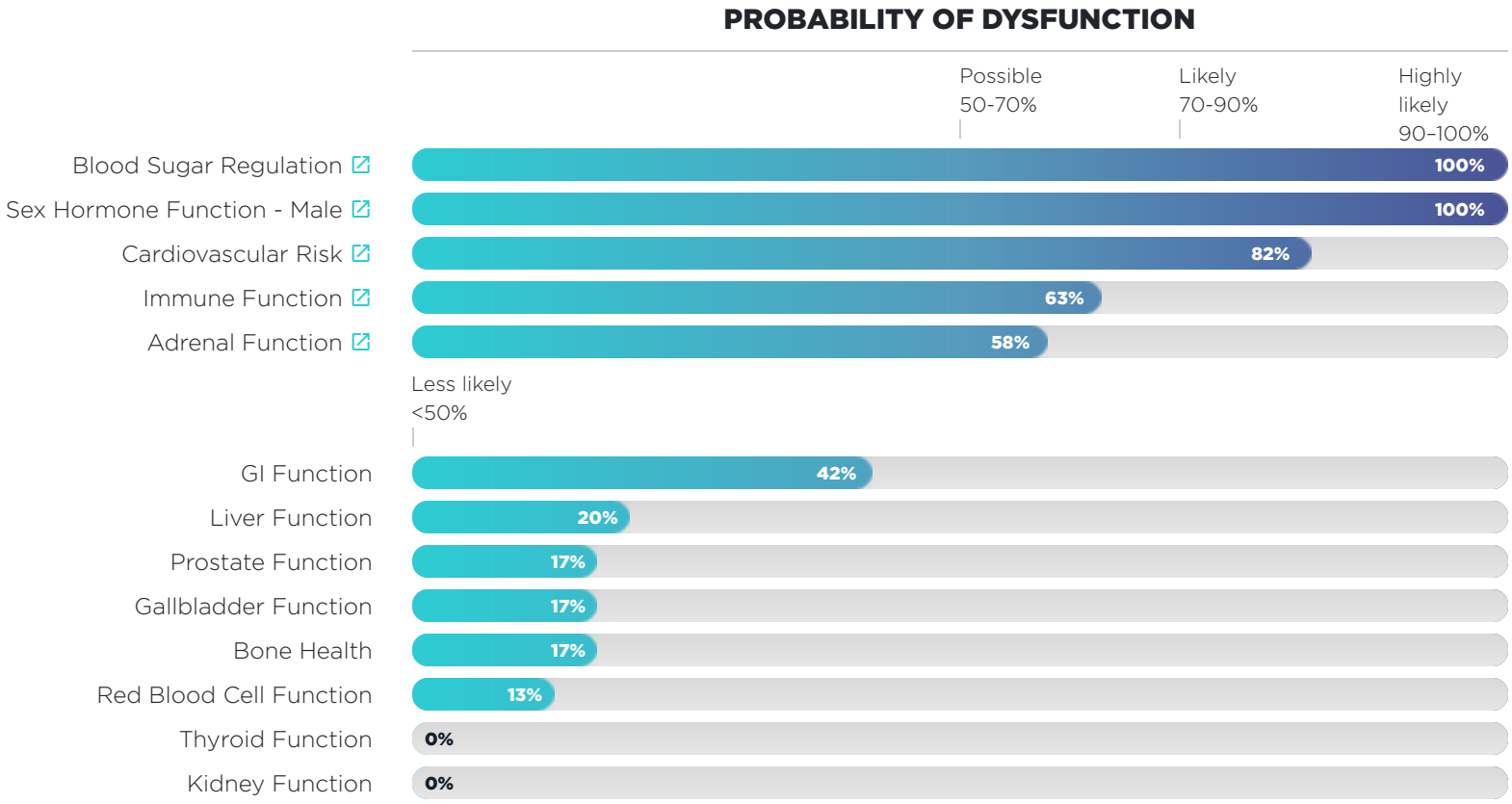
Functional Body Systems

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.

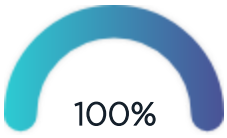
Please use this report in conjunction with the "Practitioner's Only Clinical Dysfunctions Report" to identify which dysfunctions and conditions are causing changes in the Functional Body Systems.

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



Functional Body Systems Details

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



Dysfunction Highly Likely. Much improvement required.

BLOOD SUGAR REGULATION

The Blood Sugar Regulation score allows us to assess the functional health of your patient's blood sugar regulation. A high Blood Sugar Regulation score indicates that there is dysfunction in this patient's blood sugar regulation. Blood sugar dysregulation is affected by genetics, diet, lifestyle, nutrition, and environment. Please refer to the "Clinical Dysfunctions" report to get a sense of the probability of dysfunction in these "conditions": Hypoglycemia, Metabolic Syndrome and Insulin Resistance. Long-standing Blood Sugar Dysregulation, if left unassessed or treated, may lead to hyperinsulinemia, and type 2 Diabetes.

Rationale

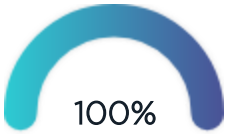
Glucose ↑, LDH ↓, Insulin - Fasting ↑, Cholesterol - Total ↑, Triglycerides ↑, LDL Cholesterol ↑, HDL Cholesterol ↓, DHEA-S - Male ↓

Biomarkers considered

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

Patient result not available - consider running in future tests:

C-Peptide, Fructosamine, Leptin - Male



Dysfunction Highly Likely. Much improvement required.

SEX HORMONE FUNCTION - MALE

The Male Sex Hormone Function score helps us assess for sex hormone regulation in your patient. A high Male Sex Hormone Function score indicates an increasing level of sex hormone deficiencies in your patient. Review the individual levels of hormones to identify which hormones are causing the high score: Testosterone Total, Testosterone Free, DHEA-S, Progesterone, Sex Hormone Binding Globulin (SHBG), and Estradiol. Please refer to the "Clinical Dysfunctions" report to get a sense of the probability of Testosterone Deficiency in this patient.

Rationale

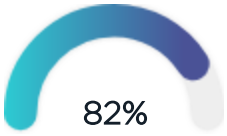
DHEA-S - Male ↓, Testosterone - Free Male ↓, Testosterone Total - Male ↓, Progesterone - Male ↓

Biomarkers considered

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

Patient result not available - consider running in future tests:

Testosterone Free - Male LABCORP



Dysfunction Likely. Improvement required

CARDIOVASCULAR RISK

The Cardiovascular Risk score is based on the measurement of 15 biomarkers in a blood test that indicates an increased risk of this patient developing cardiovascular disease (heart attack, coronary artery disease, and stroke). A high Cardiovascular Risk score indicates that your patient may have an increased risk of cardiovascular disease, Atherosclerosis, Endothelial Dysfunction, and Inflammation.

Rationale

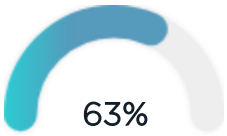
Glucose ↑, Cholesterol - Total ↑, Triglycerides ↑, LDL Cholesterol ↑, HDL Cholesterol ↓, Homocysteine ↑, Testosterone Total - Male ↓, Insulin - Fasting ↑, Testosterone - Free Male ↓

Biomarkers considered

Glucose, AST (SGOT), 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

Patient result not available - consider running in future tests:

Testosterone Free - Male LABCORP



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

IMMUNE FUNCTION

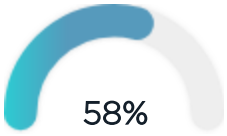
The Immune Function score allows us to assess the functional health of your patient's immune system. A high Immune Function score indicates that there is dysfunction within your patient's immune system and further assessment is needed to pinpoint exactly what that dysfunction is. Some of the factors to consider include Immune Insufficiency, Bacterial or Viral Infections, or GI dysfunction associated with immune function: abnormal mucosal barrier function, secretory IgA dysfunction or dysbiosis.

Rationale

Total WBCs ↓, Monocytes ↑, Alk Phos ↓, Iron - Serum ↓

Biomarkers considered

Total WBCs, Globulin - Total, Neutrophils, Lymphocytes, Monocytes, Albumin, Alk Phos, Iron - Serum, Ferritin



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

ADRENAL FUNCTION

The Adrenal Function score allows us to assess the functional health of your patient's adrenal glands. A high Adrenal Function score indicates that there is dysfunction within your patient's adrenal system and further assessment is needed to find out what the dysfunction is. Please refer to the "Clinical Dysfunctions" report to get a sense of the probability of dysfunction in these "conditions": Adrenal Stress and Adrenal Insufficiency.

Rationale

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

Biomarkers considered

Sodium, Potassium, Sodium/Potassium Ratio, Glucose, BUN, Chloride, CO2, Cholesterol - Total, Triglycerides, DHEA-S - Male

Patient result not available - consider running in future tests:

Cortisol - AM, Cortisol - PM

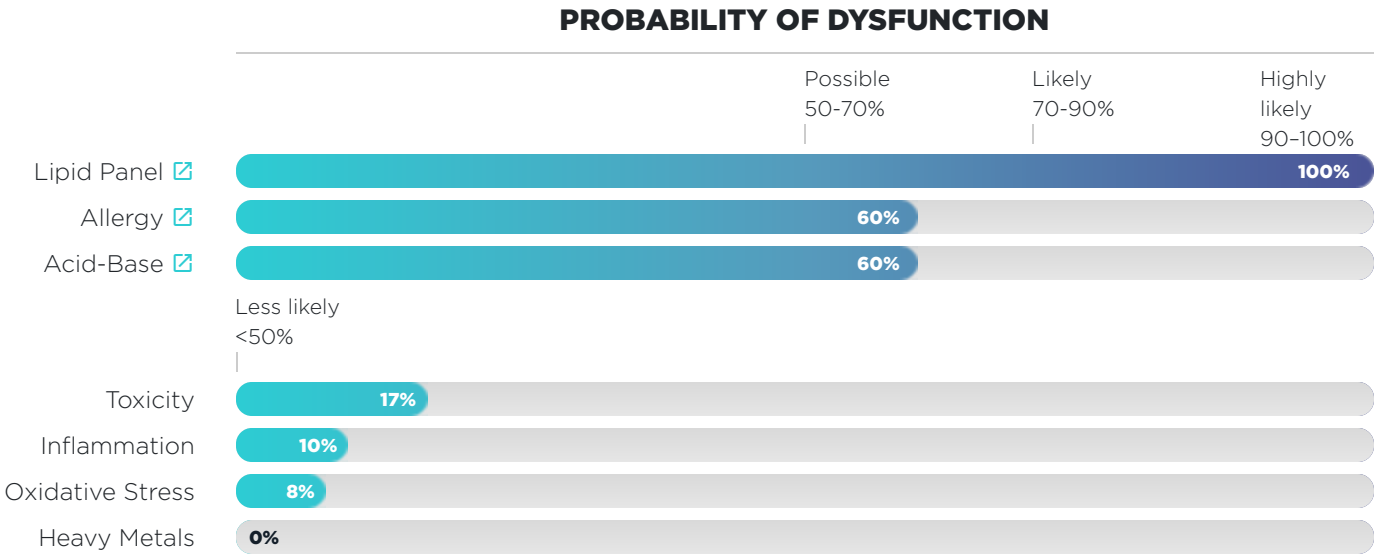
Accessory Systems

The Accessory System results represent an algorithmic analysis of this blood test. These results have been converted into your client's individual Accessory 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.

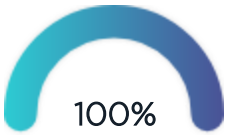
Please use this report in conjunction with the "Practitioner's Only Clinical Dysfunctions Report" to identify which dysfunctions and conditions are causing changes in the Accessory Systems.

Each Accessory System that has a probability of dysfunction above 50% is included in the section that follows so you can read a highly 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 Highly Likely. Much improvement required.

LIPID PANEL

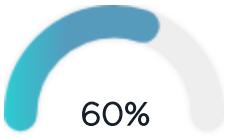
A high Lipid Panel score indicates that there is a strong clinical indication of hyperlipidemia, which has been shown to indicate a potential risk of developing atherosclerotic coronary artery disease. Although hyperlipidemia is a cause, it's important to look at many other risks for this disease including smoking, blood sugar dysregulation, hypertension, elevated homocysteine and other diet and lifestyle considerations.

Rationale

Cholesterol - Total ↑, Triglycerides ↑, LDL Cholesterol ↑, Cholesterol/HDL Ratio ↑, HDL Cholesterol ↓

Biomarkers considered

Cholesterol - Total, Triglycerides, LDL Cholesterol, Cholesterol/HDL Ratio, HDL Cholesterol



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

ALLERGY

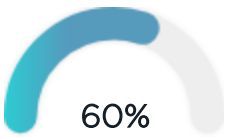
The Allergy score reflects the degree of food or environmental sensitivities/allergies your patient may be dealing with. A number of biomarkers on a blood test may increase in association with food allergies and/or sensitivities. A high Allergy score may indicate the need for further assessment or evaluation through allergy elimination/challenge, more sophisticated allergy testing and/or GI function assessment.

Rationale

Eosinophils ↑

Biomarkers considered

Eosinophils, Basophils



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

ACID-BASE

A high Acid-Base score indicates a functional imbalance in the body's pH system. Consider metabolic acidosis or metabolic alkalosis as a cause of this imbalance.

Rationale

Anion gap ↑, Potassium ↑

Biomarkers considered

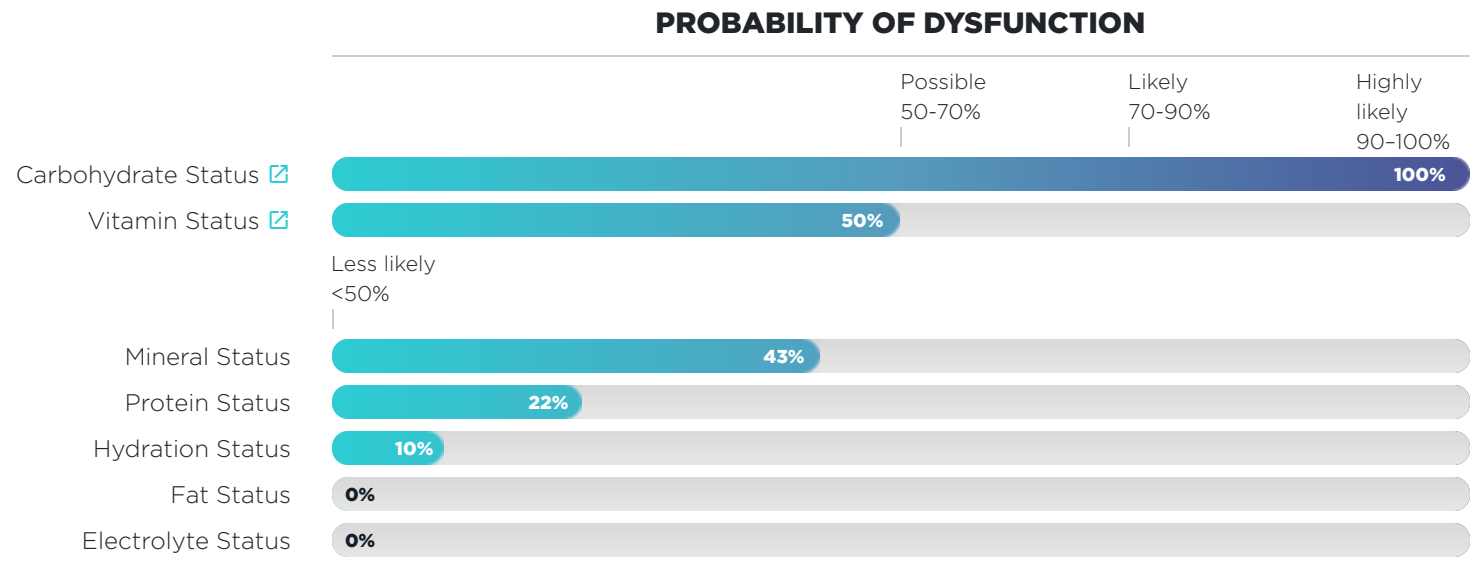
Anion gap, Potassium, Chloride, CO2, Calcium

Macronutrient Status

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

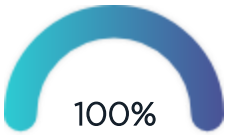
This report gives you an indication of your client's general nutritional dysfuction. The Macronutrient Status is influenced by actual dietary intake, digestion, absorption, assimilation and cellular uptake of the nutrients themselves.

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



Macronutrient Status Details

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



Dysfunction Highly Likely. Much improvement required.

CARBOHYDRATE STATUS

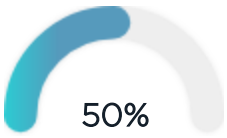
The Carbohydrate Status score gives us an assessment of how your patient's body handles their dietary intake of carbohydrates, especially refined carbohydrates, and sugars. A diet high in refined carbohydrates and sugars will deplete phosphorus stores and other important co-factors for carbohydrate metabolism. It may also increase serum glucose and serum triglyceride levels. Follow up a high Carbohydrate Status score with a thorough assessment of blood sugar regulation and also an investigation into this patient's dietary consumption of sugars and refined carbohydrates.

Rationale

Glucose ↑, LDH ↓, Cholesterol - Total ↑, Triglycerides ↑, LDL Cholesterol ↑, HDL Cholesterol ↓, Total WBCs ↓

Biomarkers considered

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



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

VITAMIN STATUS

The Vitamin Status score gives us a general indication of the balance of certain vitamins in the body based on the results of this blood test. A high Vitamin Status score indicates a level of deficiency or need in one or more of the vitamins reflected in this score, which includes vitamin B12, vitamin B6, folate, thiamin, vitamin D and vitamin C. Please use the information in the Nutrient Deficiencies report to identify which vitamin or vitamins may be in need.

Rationale

Anion gap ↑, Homocysteine ↑, MCV ↑

Biomarkers considered

Anion gap, Albumin, AST (SGOT), ALT (SGPT), GGT, Homocysteine, Vitamin D (25-OH), MCV

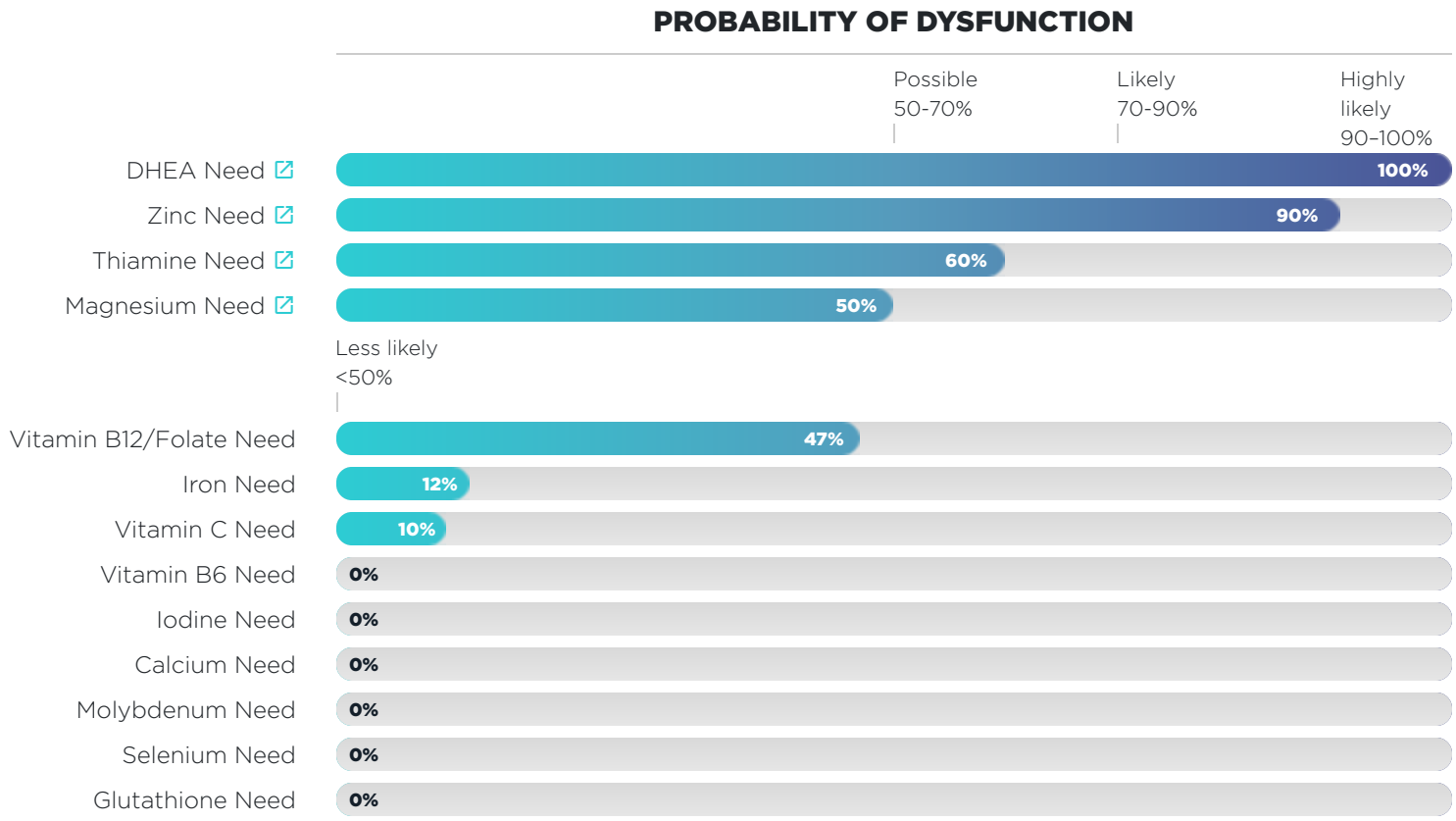
Patient result not available - consider running in future tests:

Folate, Vitamin B12

Individual Nutrient Deficiencies

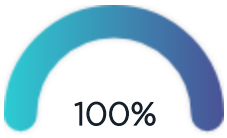
The values represent the degree of deficiency for individual nutrients based on your client's blood results. The status of an individual nutrient is based on a number of factors such as actual dietary intake, digestion, absorption, assimilation and cellular uptake of the nutrients themselves. All of these factors must be taken into consideration before determining whether or not your client 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 highly detailed description and individual explanation of the results shown in this report.



Individual Nutrient Deficiencies 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.



Dysfunction Highly Likely. Much improvement required.

DHEA NEED

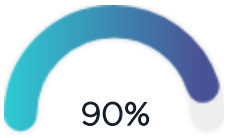
The results of this blood test indicate that this patient's **DHEA** levels might be lower than optimal.

Rationale

DHEA-S - Male ↓

Biomarkers considered

DHEA-S - Male



Dysfunction Highly Likely. Much improvement required.

ZINC NEED

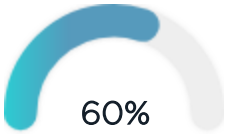
Consider a zinc need if the **Alk phos** levels are decreased.

Rationale

Alk Phos ↓

Biomarkers considered

Alk Phos



Dysfunction 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 ↑, LDH ↓

Biomarkers considered

Anion gap, CO2, Glucose, LDH, Hemoglobin - Male, Hematocrit - Male

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

MAGNESIUM NEED

A magnesium need is associated with a decreased **serum magnesium,** a decreased **GGTP**, and a decreased **serum potassium.**

Rationale

Magnesium ↓

Biomarkers considered

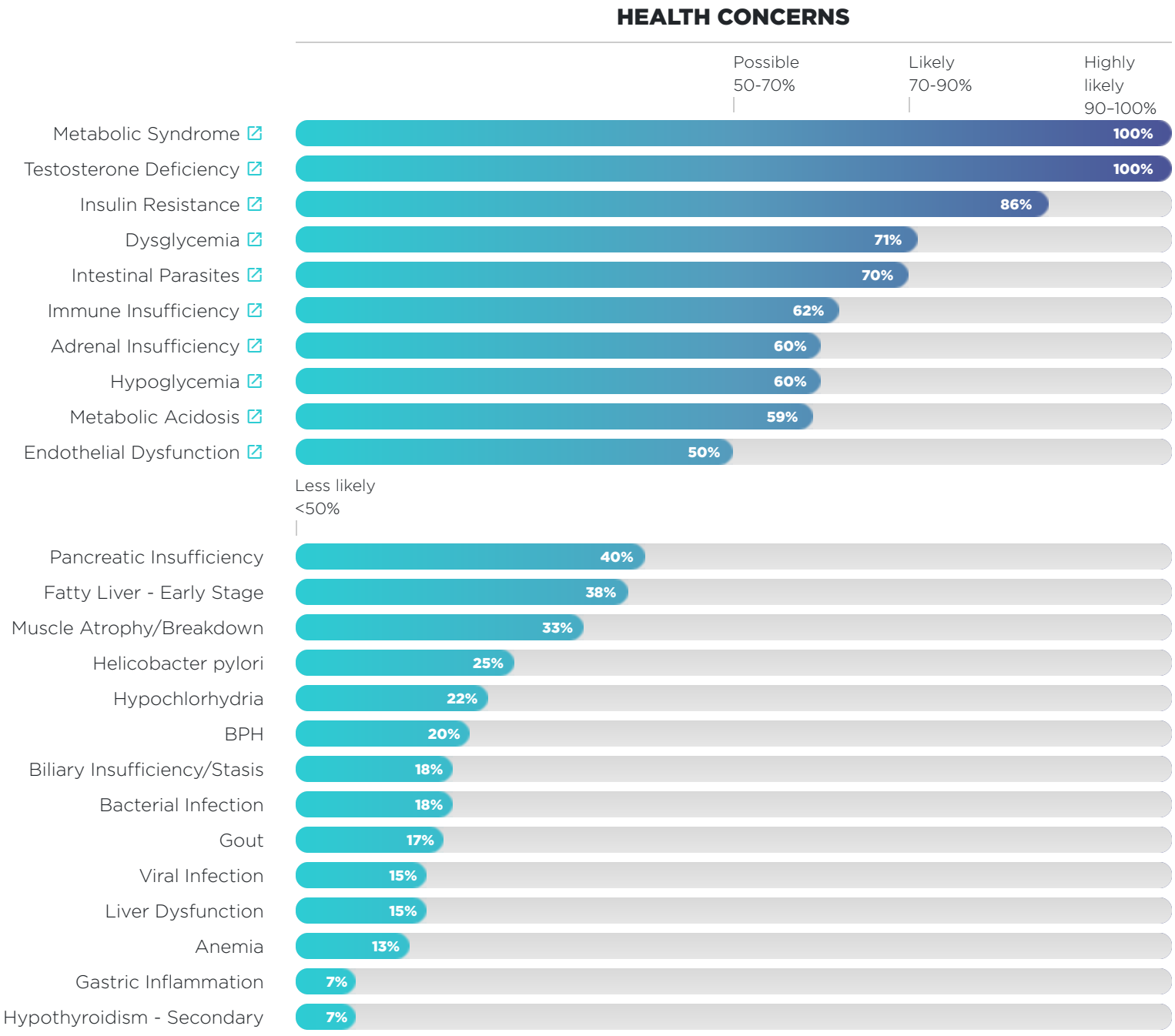
Magnesium, GGT, Potassium

Clinical Dysfunctions

Advanced practitioner only report

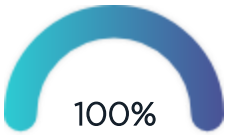
The Clinical Dysfunctions Report shows a list of likely Health Concerns that your client may be suffering from based on an analysis of their Chemistry Screen and CBC results.

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



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

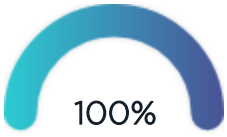
Glucose ↑, Triglycerides ↑, Insulin - Fasting ↑, Cholesterol - Total ↑, LDL Cholesterol ↑, HDL Cholesterol ↓, DHEA-S - Male ↓

Biomarkers considered

Glucose, Triglycerides, Hemoglobin A1C, Insulin - Fasting, Uric Acid - Male, Cholesterol - Total, LDL Cholesterol, HDL Cholesterol, DHEA-S - Male

Patient result not available - consider running in future tests:

Leptin - Male



Dysfunction Highly Likely. Much improvement required.

TESTOSTERONE DEFICIENCY

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

Rationale

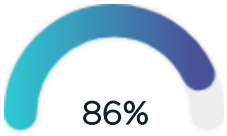
Testosterone Total - Male ↓, Testosterone - Free Male ↓

Biomarkers considered

Testosterone Total - Male, Testosterone - Free Male

Patient result not available - consider running in future tests:

Testosterone Free - Male LABCORP



Dysfunction Likely.
Improvement required

INSULIN RESISTANCE

Insulin resistance is the condition in which people lose sensitivity to the hormone insulin. As the cells become resistant to insulin, levels of insulin and blood glucose will rise. Consider insulin resistance with an increased **fasting insulin** and an increased **fasting blood glucose**, an increased **Hemoglobin A1C**, an increased **triglyceride** and an increased **Triglyceride/HDL ratio.** You may also see an increased **total cholesterol**, an increased **C-Peptide**, a decreased **HDL** and a decreased **phosphorous**.

Rationale

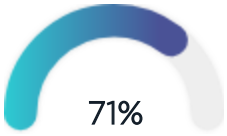
Triglycerides ↑, Triglyceride/HDL Ratio ↑, Glucose ↑, Insulin - Fasting ↑

Biomarkers considered

Triglycerides, Triglyceride/HDL Ratio, Glucose, Insulin - Fasting, Hemoglobin A1C, Cholesterol - Total

Patient result not available - consider running in future tests:

C-Peptide, Leptin - Male



Dysfunction Likely.
Improvement required

DYSGLYCEMIA

Dysglycemia is an imbalance in the ability of the body to regulate blood glucose levels causing unhealthy blood glucose levels that can lead to Diabetes, Metabolic Syndrome, Obesity, Insulin Resistance and Hyperinsulinemia. Consider dysglycemia with an **elevated blood glucose level** and an **elevated hemoglobin A1C level**.

Rationale

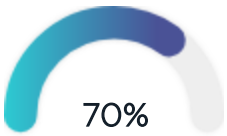
Glucose ↑

Biomarkers considered

Glucose, Hemoglobin A1C

Patient result not available - consider running in future tests:

Leptin - Male



Dysfunction Likely.
Improvement required

INTESTINAL PARASITES

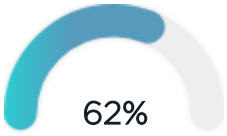
Consider intestinal parasites with increased **eosinophils**, increased **basophils**, and increased **monocytes**. Intestinal parasites are **probable** and should be ruled out. Additional elements that may be out of range with intestinal parasites include a decreased **hemoglobin**, a decreased **hematocrit** and a decreased **serum iron**. It is important to do further studies if you suspect intestinal parasites, i.e. a stool analysis with ova and parasite, especially if the subjective indicators are present.

Rationale

Eosinophils ↑, Monocytes ↑

Biomarkers considered

Eosinophils, Basophils, Iron - Serum, Hemoglobin - Male, Hematocrit - Male, Monocytes



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

IMMUNE INSUFFICIENCY

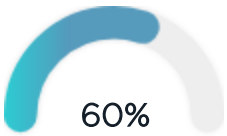
Consider an immune insufficiency with a decreased **total WBC count** along with a decreased **albumin,** a decreased **total globulin** and a decreased **alkaline phosphatase** level. Additional elements that may be out of range with immune insufficiency include an increased **total bilirubin**, an increased **hemoglobin**, an increased **hematocrit** and an increased **RBC** count.

Rationale

Total WBCs ↓, Alk Phos ↓

Biomarkers considered

Total WBCs, Albumin, Globulin - Total, Alk Phos, Bilirubin - Total, RBC - Male, Hemoglobin - Male, Hematocrit - Male



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

ADRENAL INSUFFICIENCY

Adrenal insufficiency can cause a decrease in the secretions of both the glucocorticoid and mineralcorticoid hormones. A decrease in aldosterone, the major mineralcorticoid, from adrenal insufficiency will have an impact on potassium and sodium metabolism causing an increase in serum potassium and a decrease in serum sodium. Consider Adrenal Insufficiency with an **increased serum potassium** along with a **decreased sodium and/or chloride** and a **decreased serum DHEA-sulfate** . Additional elements that may be out of range with adrenal insufficiency include an **increased blood glucose** and an **increased serum triglyceride.** Urinary chloride will be increased. Adrenal insufficiency can be confirmed with salivary cortisol/DHEA studies.

Rationale

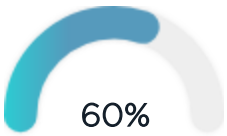
Potassium ↑, Cholesterol - Total ↑, Triglycerides ↑, DHEA-S - Male ↓

Biomarkers considered

Sodium/Potassium Ratio, Sodium, Potassium, Glucose, Chloride, Cholesterol - Total, Triglycerides, DHEA-S - Male

Patient result not available - consider running in future tests:

Cortisol - AM, Cortisol - PM



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

HYPOGLYCEMIA

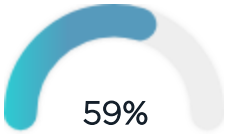
Consider hypoglycemia with a decreased fasting **blood glucose** along with a decreased **LDH**. Additional elements that may be out of range with hypoglycemia include a decreased **Hemoglobin A1C** and an increased **SGPT/ALT** level.

Rationale

LDH ↓

Biomarkers considered

Glucose, LDH, Hemoglobin A1C



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

METABOLIC ACIDOSIS

Consider metabolic acidosis if the **anion gap** is increased along with an increased **potassium**, a decreased CO_2 and an increased **chloride**.

Rationale

Anion gap ↑, Potassium ↑

Biomarkers considered

Anion gap, Potassium, Chloride, CO2

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

ENDOTHELIAL DYSFUNCTION

Consider endothelial dysfunction with an increased **homocysteine**, an increased **blood glucose**, an increased **fibrinogen**, an increased **HS-CRP**, a decreased **free serum testosterone**, and an increased **iron**. Some of the other causes of endothelial dysfunction include smoking, hypertension, nutrient deficiencies, a standard Western diet, and a lack of exercise.

Rationale

Homocysteine ↑, Glucose ↑, Testosterone - Free Male ↓

Biomarkers considered

Fibrinogen, Hs CRP - Male, Homocysteine, Glucose, Iron - Serum, Testosterone - Free Male

Patient result not available - consider running in future tests:

Testosterone Free - Male LABCORP

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

Analytics

Blood Test Results

The Blood Test Results Report lists the results of the client'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.

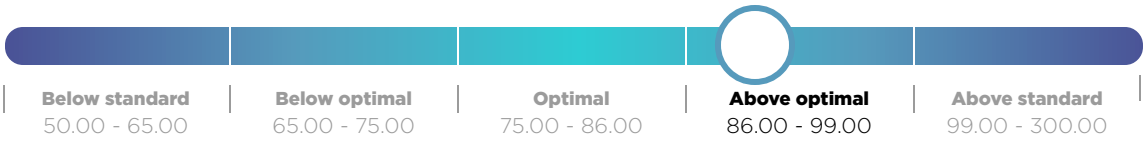
Each biomarker in the Blood Test results report that is above or below the Optimal or Standard Range hyperlinks into our Out of Optimal Range report so you can read a description of the biomarker and some of the reasons why it may be high or low.

Total number of biomarkers by optimal range

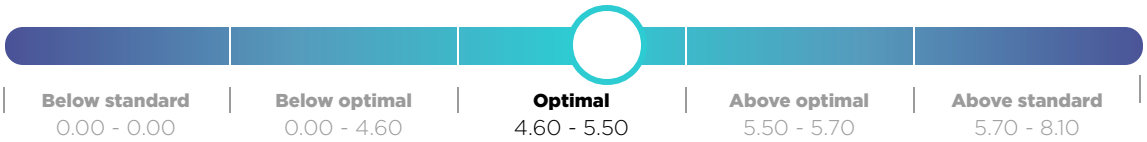
Alarm low	Below standard	Below optimal	Optimal	Above optimal	Above standard	Alarm high	Total
0	0	13	47	10	5	0	75

BLOOD GLUCOSE

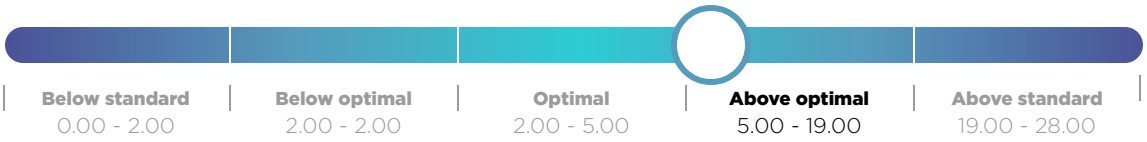
Glucose
90.00 mg/dL



Hemoglobin A1C
5.20 %

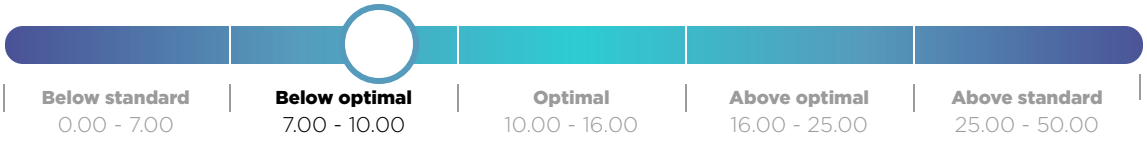


Insulin - Fasting
6.40 µIU/ml

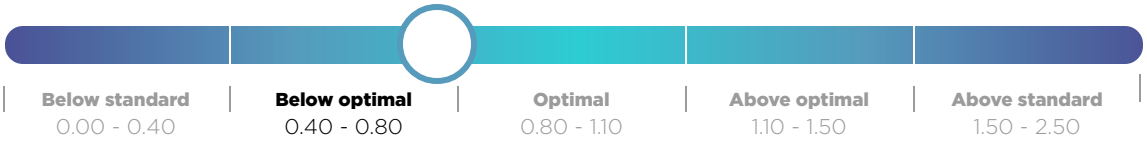


RENAL

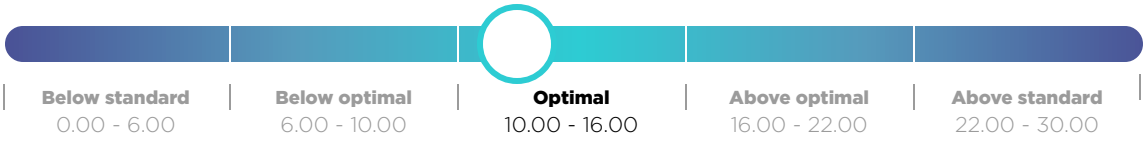
BUN
9.00 mg/dL



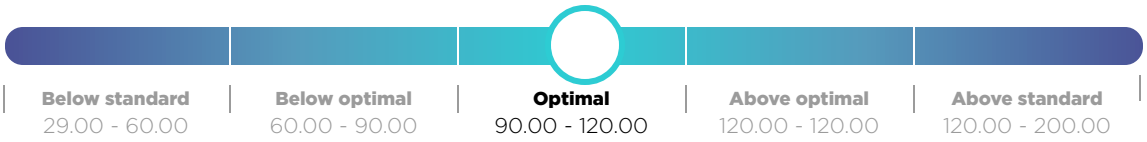
Creatinine
0.77 mg/dL



BUN/Creatinine Ratio
11.68 Ratio

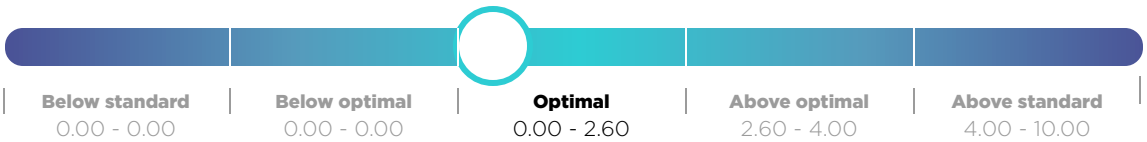


eGFR Non-Afr. American
107.00 mL/min/1.73m2



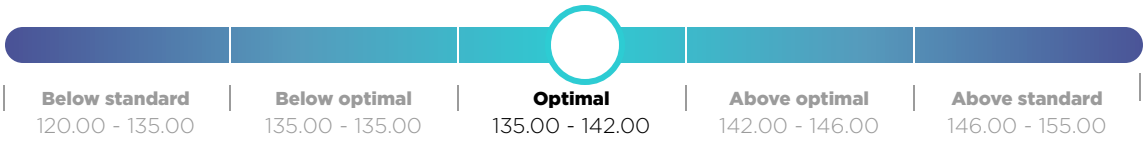
PROSTATE

PSA - Total
0.40 ng/ml

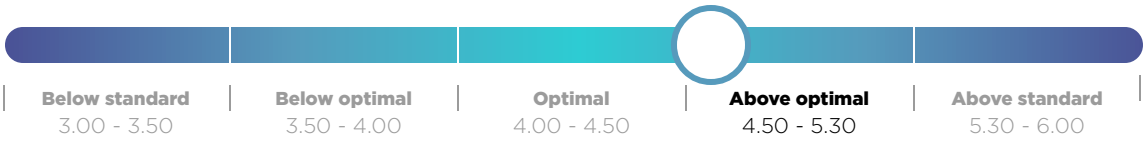


ELECTROLYTES

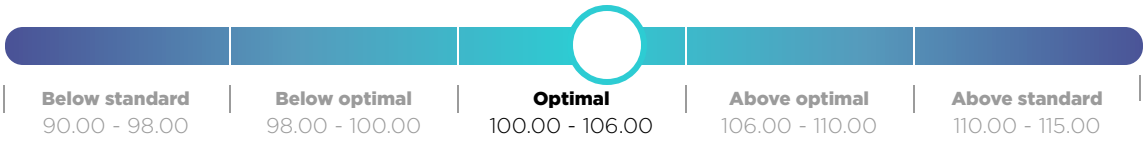
Sodium
139.00 mEq/L



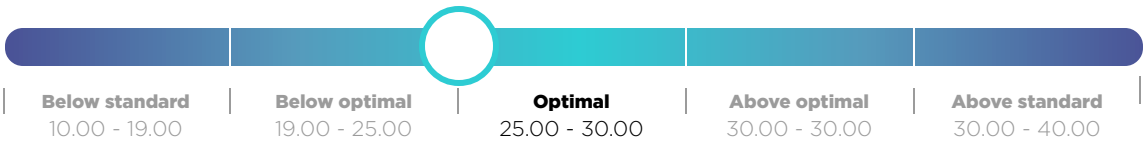
Potassium
4.60 mEq/L



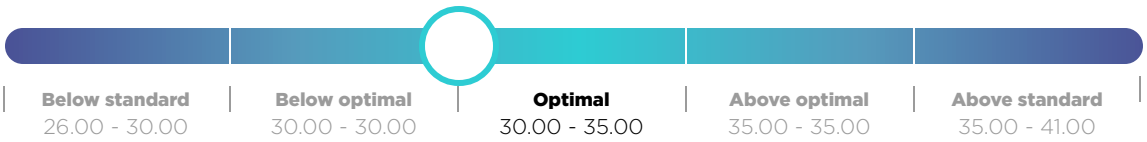
Chloride
104.00 mEq/L



CO2
25.00 mEq/L

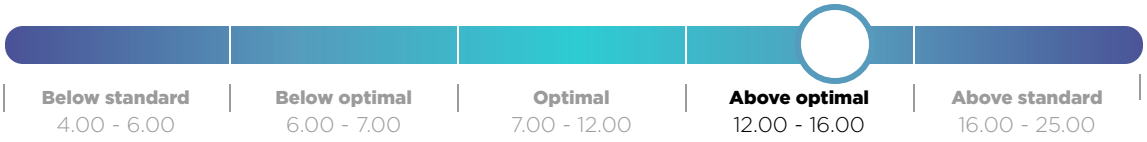


Sodium/Potassium Ratio
30.21 ratio

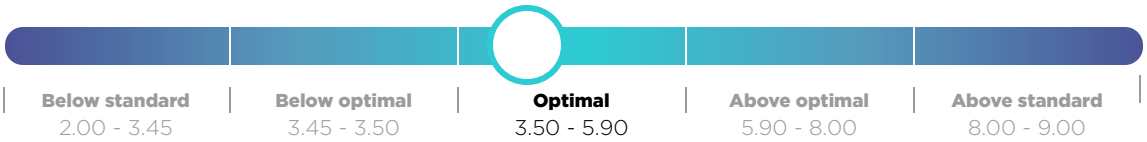


METABOLIC

Anion gap
14.60 mEq/L

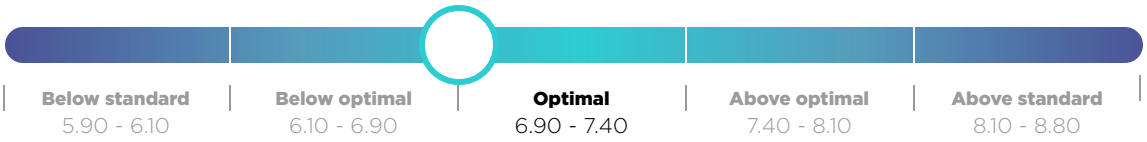


Uric Acid - Male
4.30 mg/dL

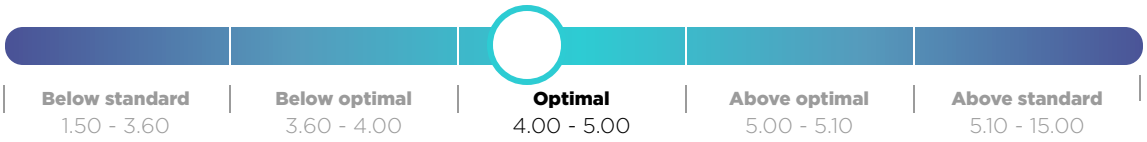


PROTEINS

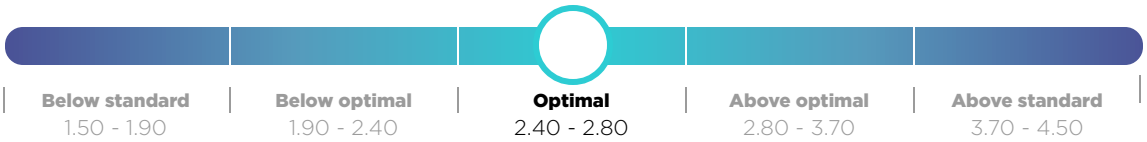
Protein - Total
6.90 g/dL



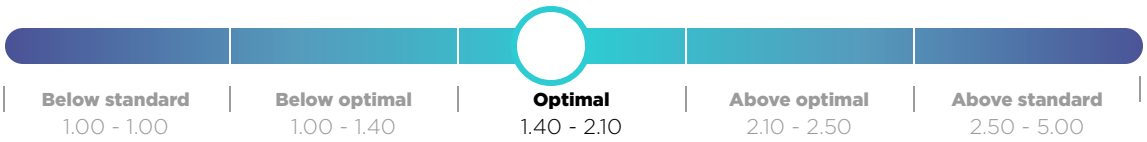
Albumin
4.30 g/dL



Globulin - Total
2.60 g/dL

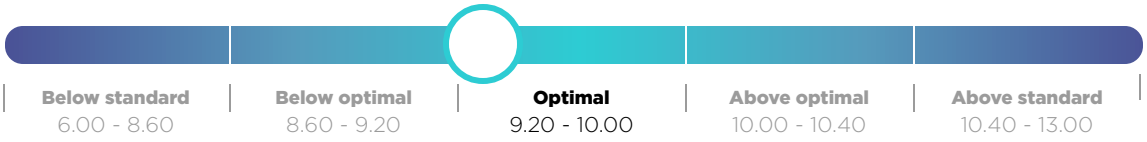


Albumin/Globulin Ratio
1.70 ratio

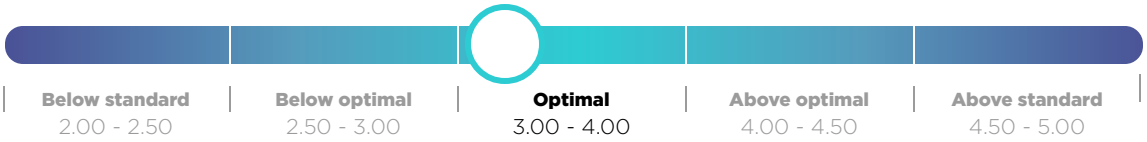


MINERALS

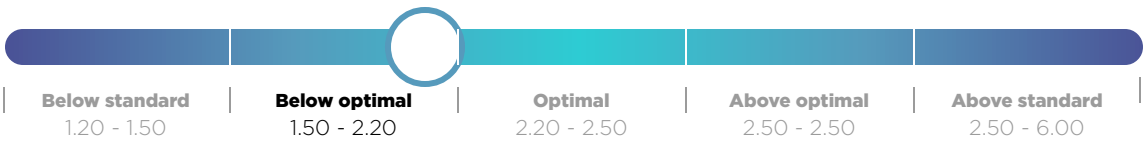
Calcium
9.30 mg/dL



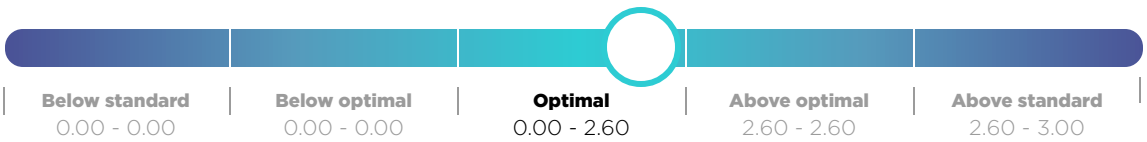
Phosphorus
3.20 mg/dL



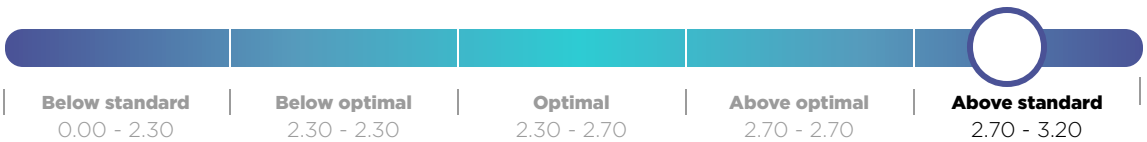
Magnesium
2.10 mg/dl



Calcium/Albumin Ratio
2.16 ratio

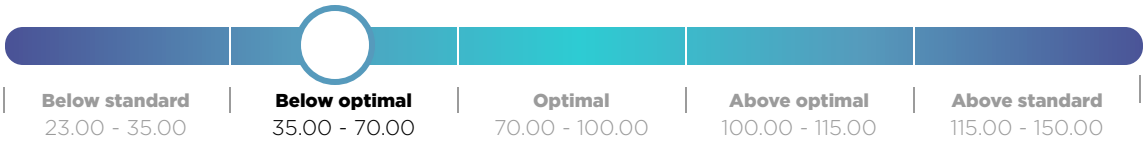


Calcium/Phosphorus Ratio
2.90 ratio

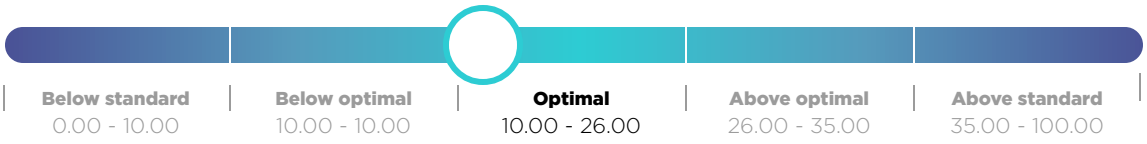


LIVER AND GB

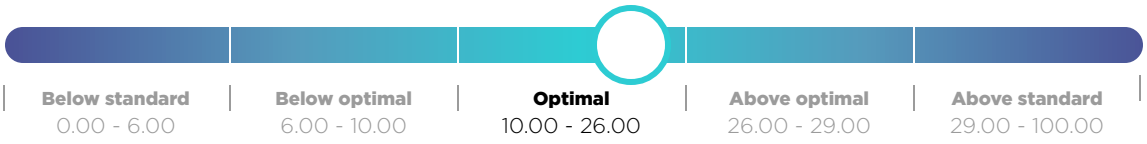
Alk Phos
51.00 IU/L



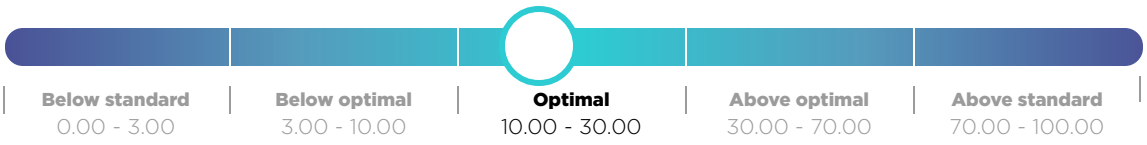
AST (SGOT)
12.00 IU/L



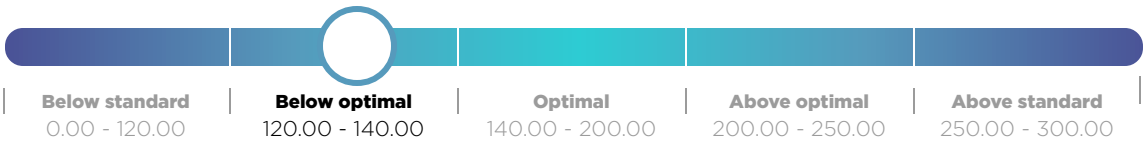
ALT (SGPT)
22.00 IU/L



GGT
17.00 IU/L



LDH
131.00 IU/L



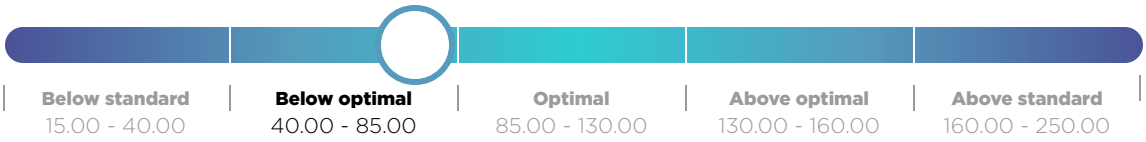
Bilirubin - Total
0.60 mg/dL

Bilirubin - Direct
0.10 mg/dL

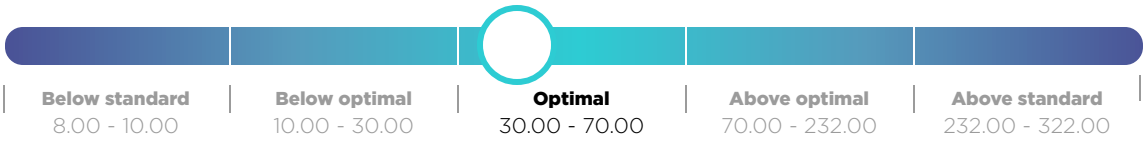
Bilirubin - Indirect
0.50 mg/dL

IRON MARKERS

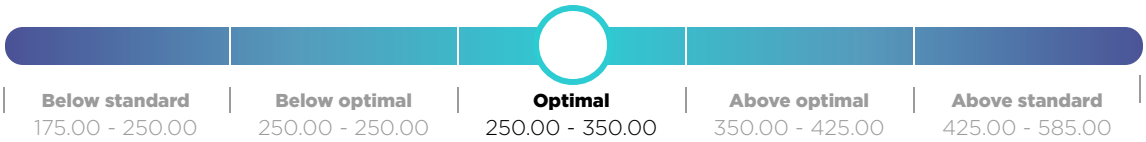
Iron - Serum
78.00 µg/dL



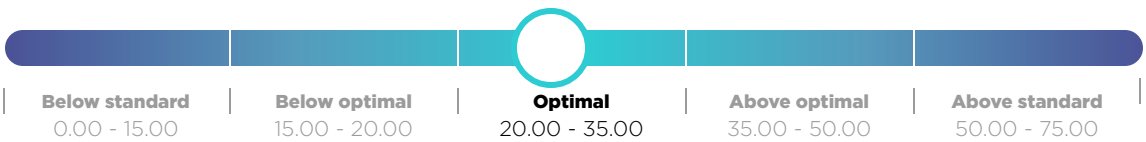
Ferritin
41.00 ng/mL



TIBC
300.00 µg/dL

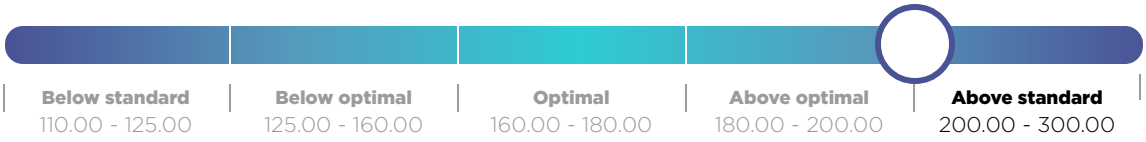


% Transferrin saturation
26.00 %

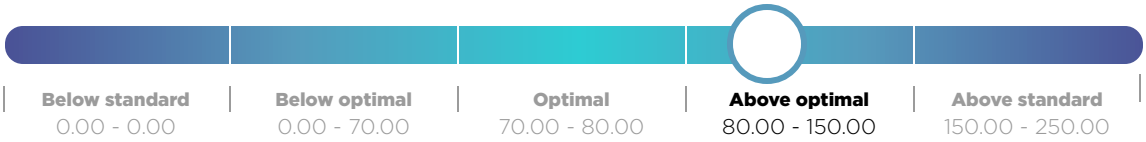


LIPIDS

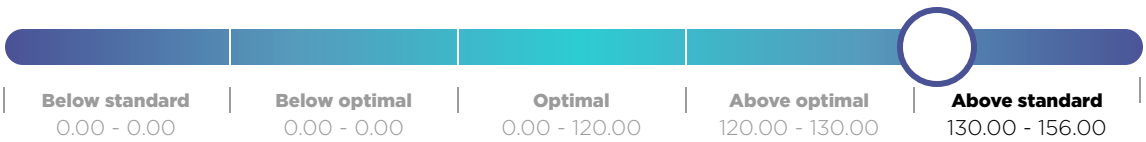
Cholesterol - Total
203.00 mg/dL



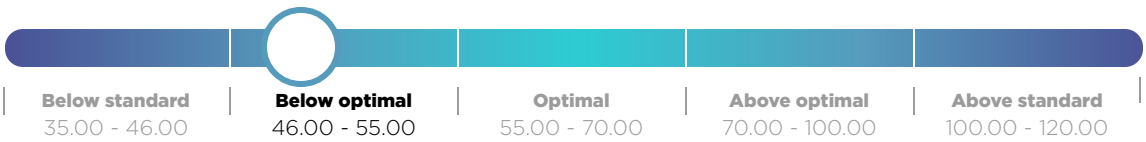
Triglycerides
107.00 mg/dL



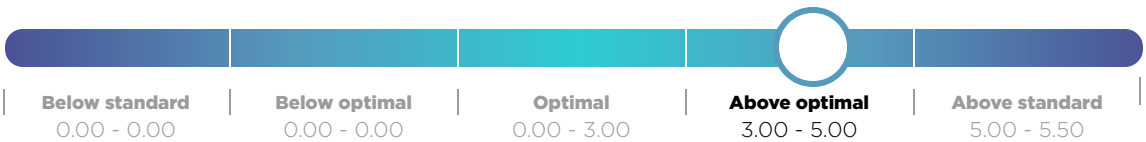
LDL Cholesterol
133.00 mg/dL



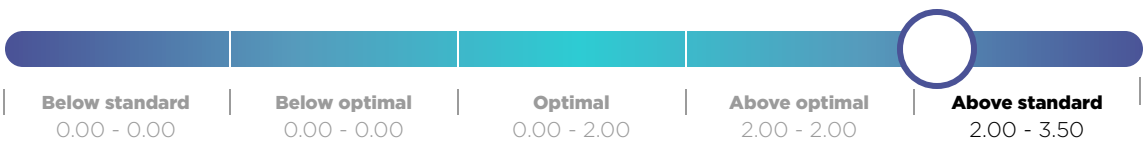
HDL Cholesterol
49.00 mg/dL



Cholesterol/HDL Ratio
4.10 Ratio

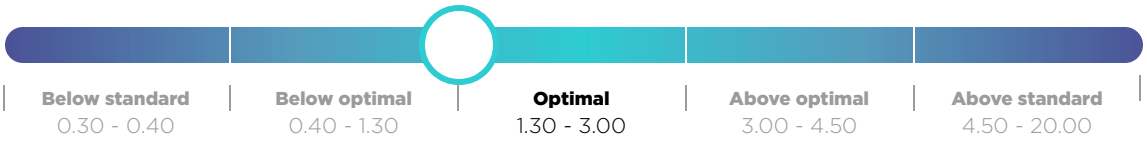


Triglyceride/HDL Ratio
2.18 ratio

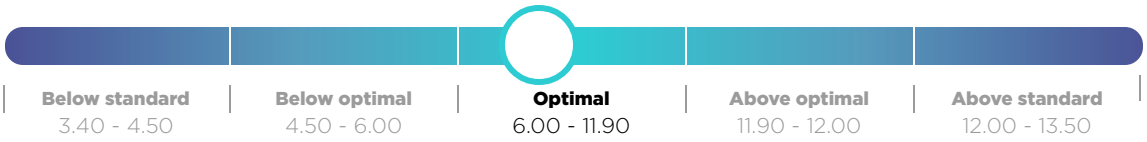


THYROID

TSH
1.31 µU/mL

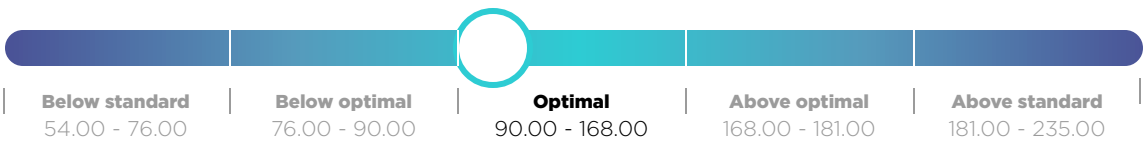


Total T4
8.30 µg/dL

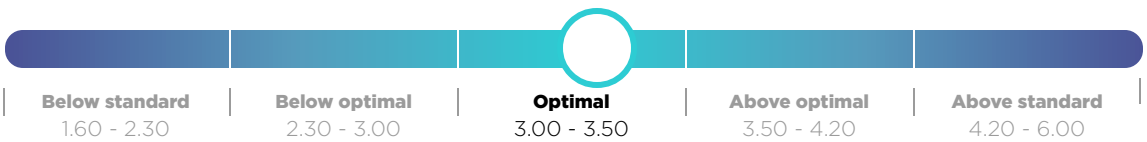


Free T4
1.30 ng/dL

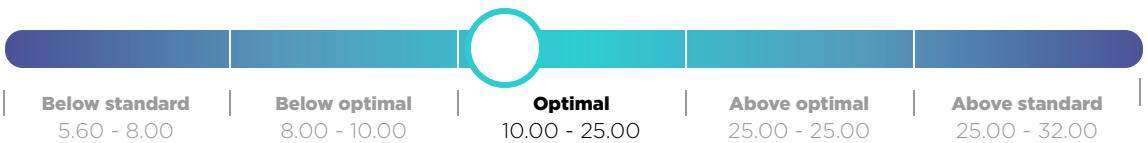
Total T3
103.00 ng/dL



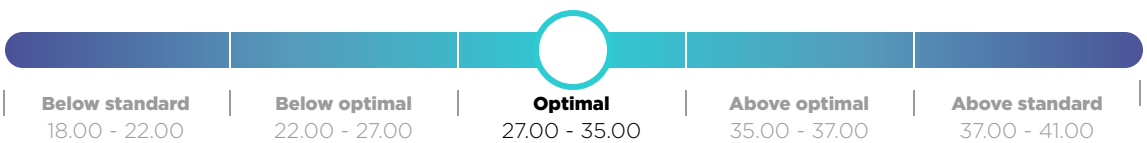
Free T3
3.30 pg/ml



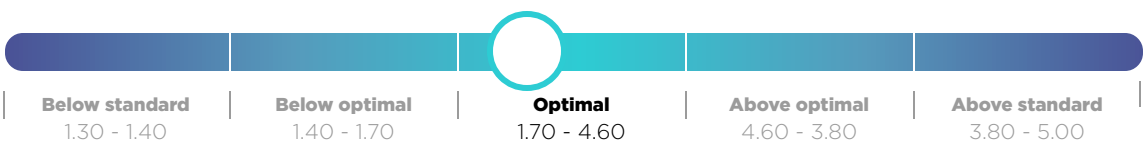
Reverse T3
13.00 ng/dl



T3 Uptake
31.00 %

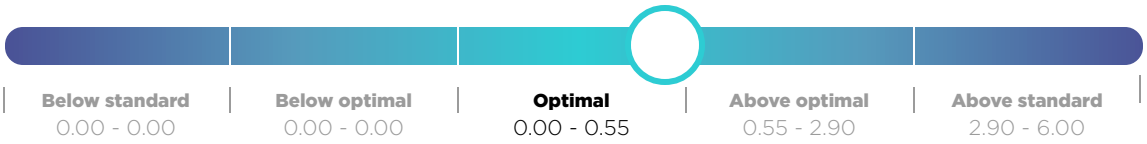


Free Thyroxine Index (T7)
2.60 Index

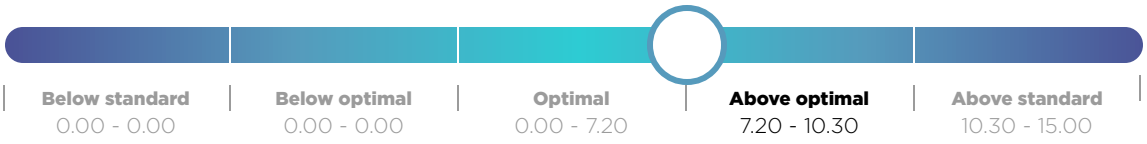


INFLAMMATION

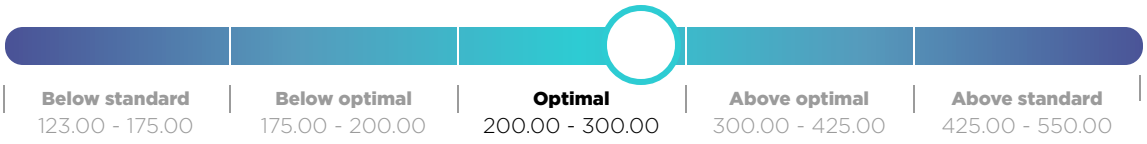
Hs CRP - Male
0.50 mg/L



Homocysteine
7.30 µmol/L

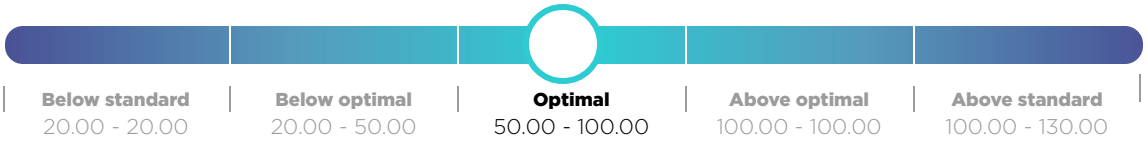


Fibrinogen
283.00 mg/dl



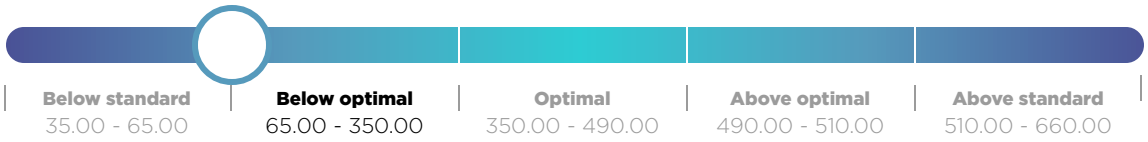
VITAMINS

Vitamin D (25-OH)
74.00 ng/ml

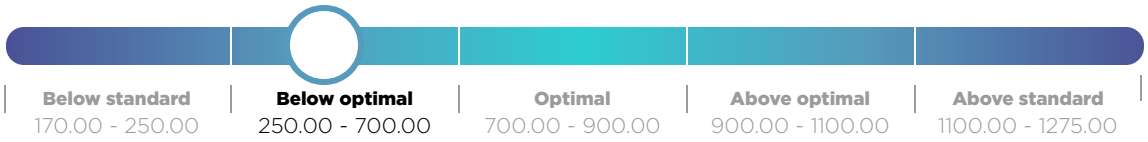


HORMONES

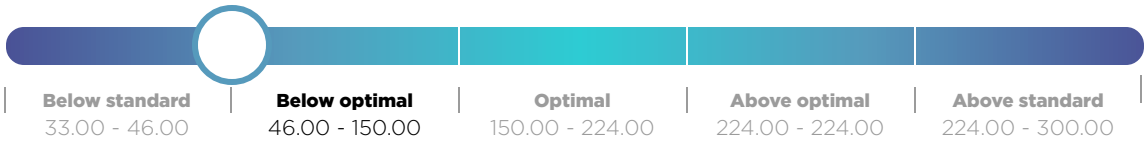
DHEA-S - Male
75.00 mcg/dl



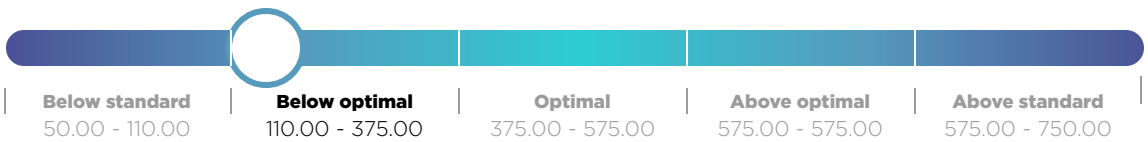
Testosterone Total - Male
439.00 ng/dl



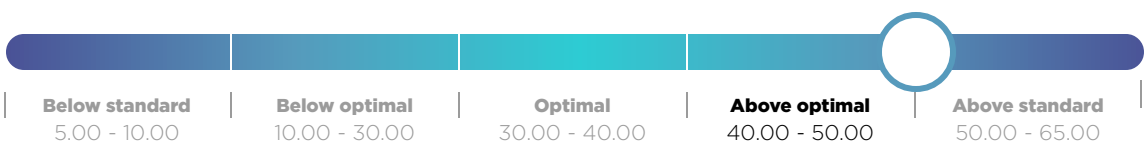
Testosterone - Free Male
46.50 pg/ml



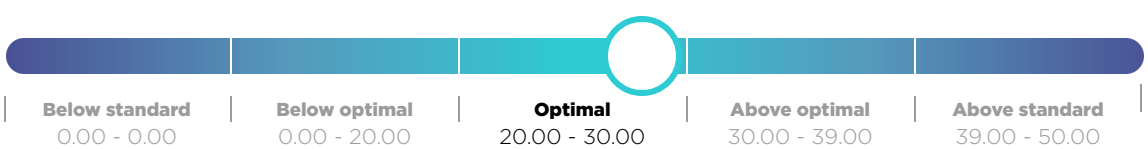
Testosterone - Bioavailable Male
162.00 ng/dl



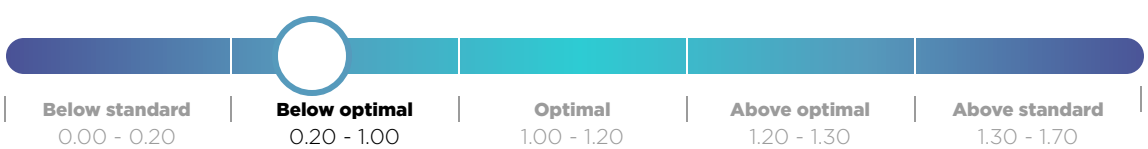
Sex Hormone Binding Globulin - Male
50.00 nmol/L



Estradiol - Male
28.00 pg/ml

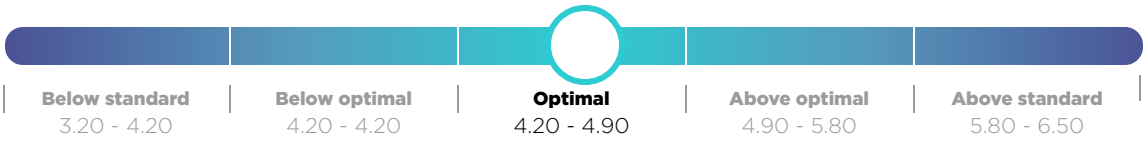


Progesterone - Male
0.50 ng/ml

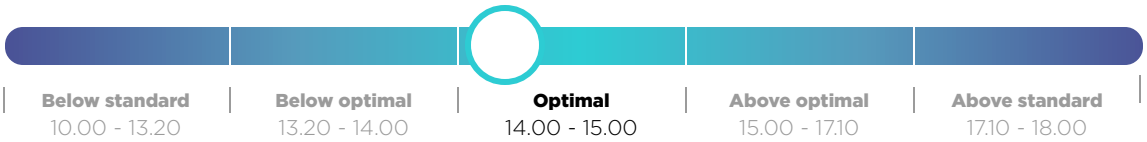


CBC/HEMATOLOGY

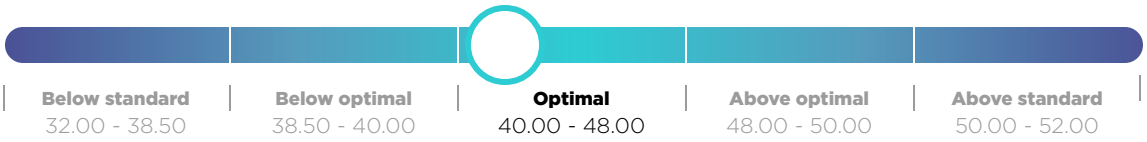
RBC - Male
4.60 m/cumm



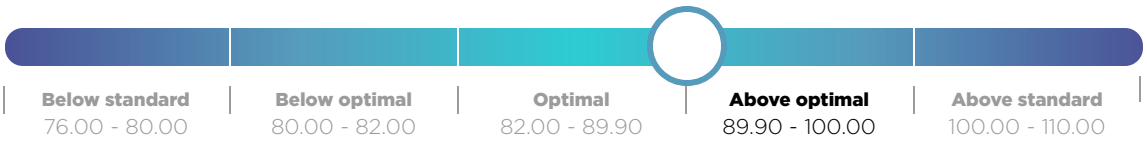
Hemoglobin - Male
14.20 g/dl



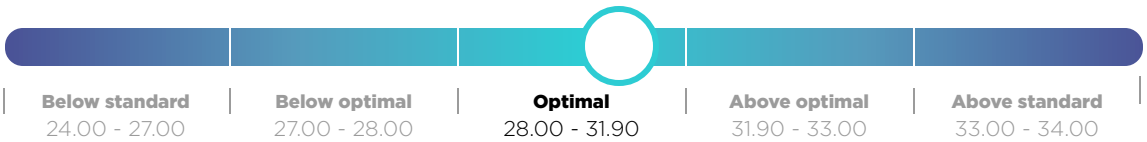
Hematocrit - Male
41.60 %



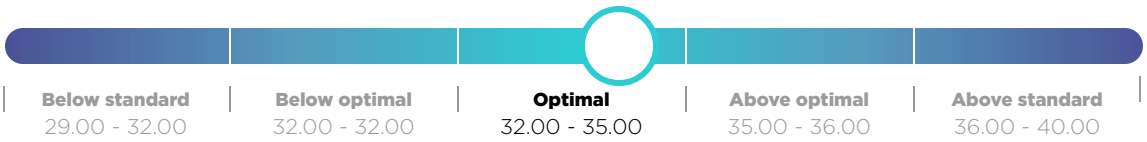
MCV
90.40 fL



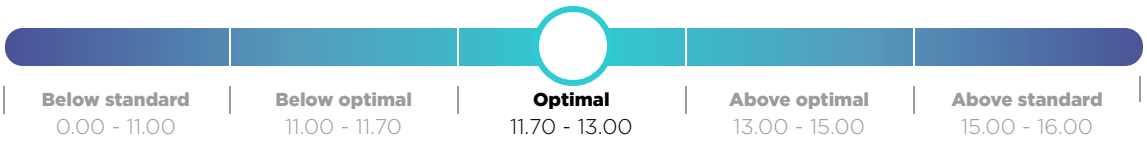
MCH
30.90 pg



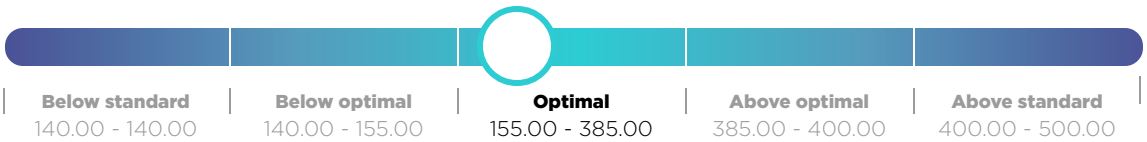
MCHC
34.10 g/dL



RDW
12.40 %

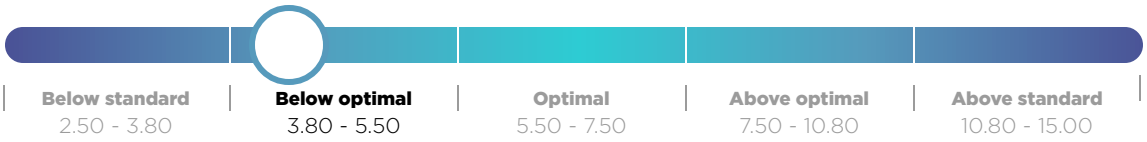


Platelets
217.00 k/cumm

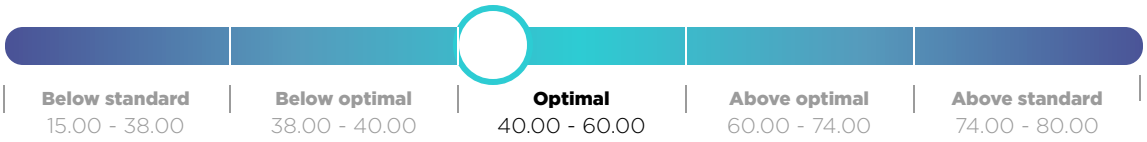


WHITE BLOOD CELLS

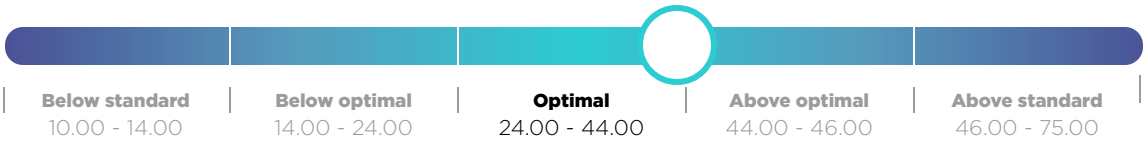
Total WBCs
4.30 k/cumm



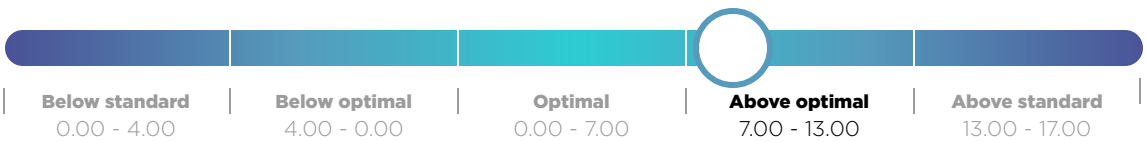
Neutrophils
43.40 %



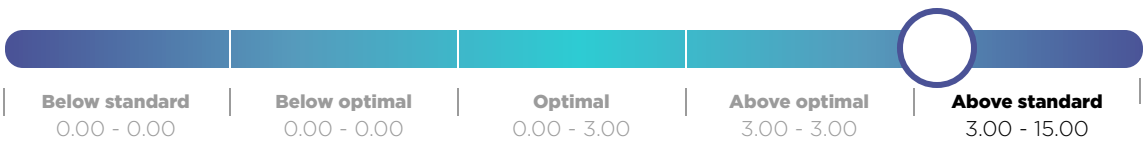
Lymphocytes
43.00 %



Monocytes
8.20 %



Eosinophils
4.50 %



Basophils
0.90 %

Blood Test Results Comparative

The Blood Test Results Comparative Report lists the results of the client'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	Below standard	Below optimal	Optimal	Above optimal	Above standard	Alarm high
Current	0	0	13	47	10	5	0
Previous	0	2	11	39	15	6	0

Comparative Report

continued

Biomarker	Previous May 20 2017	Current Aug 14 2018	Optimal range	Standard range	Units
Glucose	94.00	90.00	75.00 - 86.00	65.00 - 99.00	mg/dL
Hemoglobin A1C	5.70	5.20	4.60 - 5.50	0.00 - 5.70	%
Insulin - Fasting	7.00	6.40	2.00 - 5.00	2.00 - 19.00	µIU/ml
BUN	7.00	9.00	10.00 - 16.00	7.00 - 25.00	mg/dL
Creatinine	0.86	0.77	0.80 - 1.10	0.40 - 1.50	mg/dL
BUN/Creatinine Ratio	8.13	11.68	10.00 - 16.00	6.00 - 22.00	Ratio
eGFR Non-Afr. American	103.00	107.00	90.00 - 120.00	60.00 - 120.00	mL/min/1.73m2
PSA - Total	0.50	0.40	0.00 - 2.60	0.00 - 4.00	ng/ml
Sodium	139.00	139.00	135.00 - 142.00	135.00 - 146.00	mEq/L
Potassium	4.70	4.60	4.00 - 4.50	3.50 - 5.30	mEq/L
Chloride	104.00	104.00	100.00 - 106.00	98.00 - 110.00	mEq/L
CO2	28.00	25.00	25.00 - 30.00	19.00 - 30.00	mEq/L
Sodium/Potassium Ratio	29.57	30.21	30.00 - 35.00	30.00 - 35.00	ratio
Anion gap	11.70	14.60	7.00 - 12.00	6.00 - 16.00	mEq/L
Uric Acid - Male	5.10	4.30	3.50 - 5.90	3.45 - 8.00	mg/dL
Protein - Total	6.60	6.90	6.90 - 7.40	6.10 - 8.10	g/dL
Albumin	4.40	4.30	4.00 - 5.00	3.60 - 5.10	g/dL
Globulin - Total	2.20	2.60	2.40 - 2.80	1.90 - 3.70	g/dL
Albumin/Globulin Ratio	2.00	1.70	1.40 - 2.10	1.00 - 2.50	ratio
Calcium	9.50	9.30	9.20 - 10.00	8.60 - 10.40	mg/dL
Phosphorus	3.20	3.20	3.00 - 4.00	2.50 - 4.50	mg/dL
Magnesium	2.20	2.10	2.20 - 2.50	1.50 - 2.50	mg/dl
Calcium/Albumin Ratio	2.15	2.16	0.00 - 2.60	0.00 - 2.60	ratio
Calcium/Phosphorus Ratio	2.96	2.90	2.30 - 2.70	2.30 - 2.70	ratio
Alk Phos	47.00	51.00	70.00 - 100.00	35.00 - 115.00	IU/L
AST (SGOT)	15.00	12.00	10.00 - 26.00	10.00 - 35.00	IU/L
ALT (SGPT)	25.00	22.00	10.00 - 26.00	6.00 - 29.00	IU/L
GGT	17.00	17.00	10.00 - 30.00	3.00 - 70.00	IU/L
LDH	137.00	131.00	140.00 - 200.00	120.00 - 250.00	IU/L
Bilirubin - Total	1.30	0.60	0.10 - 0.90	0.20 - 1.20	mg/dL
Bilirubin - Direct	0.20	0.10	0.00 - 0.19	0.00 - 0.20	mg/dL
Bilirubin - Indirect	1.10	0.50	0.10 - 0.70	0.20 - 1.20	mg/dL
Iron - Serum	144.00	78.00	85.00 - 130.00	40.00 - 160.00	µg/dL
Ferritin	54.00	41.00	30.00 - 70.00	10.00 - 232.00	ng/mL
TIBC	285.00	300.00	250.00 - 350.00	250.00 - 425.00	µg/dL
% Transferrin saturation	51.00	26.00	20.00 - 35.00	15.00 - 50.00	%

Biomarker	Previous May 20 2017	Current Aug 14 2018	Optimal range	Standard range	Units
Cholesterol - Total	180.00	203.00	160.00 - 180.00	125.00 - 200.00	mg/dL
Triglycerides	100.00	107.00	70.00 - 80.00	0.00 - 150.00	mg/dL
LDL Cholesterol	109.00	133.00	0.00 - 120.00	0.00 - 130.00	mg/dL
HDL Cholesterol	51.00	49.00	55.00 - 70.00	46.00 - 100.00	mg/dL
Cholesterol/HDL Ratio	3.50	4.10	0.00 - 3.00	0.00 - 5.00	Ratio
Triglyceride/HDL Ratio	1.96	2.18	0.00 - 2.00	0.00 - 2.00	ratio
TSH	1.40	1.31	1.30 - 3.00	0.40 - 4.50	µU/mL
Total T4	8.20	8.30	6.00 - 11.90	4.50 - 12.00	µg/dL
Free T4	1.10	1.30	1.00 - 1.50	0.80 - 1.80	ng/dL
Total T3	104.00	103.00	90.00 - 168.00	76.00 - 181.00	ng/dL
Free T3	3.20	3.30	3.00 - 3.50	2.30 - 4.20	pg/ml
Reverse T3	19.00	13.00	10.00 - 25.00	8.00 - 25.00	ng/dl
T3 Uptake	31.00	31.00	27.00 - 35.00	22.00 - 37.00	%
Free Thyroxine Index (T7)	2.50	2.60	1.70 - 4.60	1.40 - 3.80	Index
Hs CRP - Male	0.50	0.50	0.00 - 0.55	0.00 - 2.90	mg/L
Homocysteine	8.80	7.30	0.00 - 7.20	0.00 - 10.30	µmol/L
Fibrinogen	295.00	283.00	200.00 - 300.00	175.00 - 425.00	mg/dl
Vitamin D (25-OH)	35.00	74.00	50.00 - 100.00	20.00 - 100.00	ng/ml
DHEA-S - Male	62.00	75.00	350.00 - 490.00	65.00 - 510.00	mcg/dl
Testosterone Total - Male	535.00	439.00	700.00 - 900.00	250.00 - 1100.00	ng/dl
Testosterone - Free Male	74.90	46.50	150.00 - 224.00	46.00 - 224.00	pg/ml
Testosterone - Bioavailable Male		162.00	375.00 - 575.00	110.00 - 575.00	ng/dl
Sex Hormone Binding Globulin - Male	47.00	50.00	30.00 - 40.00	10.00 - 50.00	nmol/L
Estradiol - Male	42.00	28.00	20.00 - 30.00	0.00 - 39.00	pg/ml
Progesterone - Male		0.50	1.00 - 1.20	0.20 - 1.30	ng/ml
RBC - Male	4.88	4.60	4.20 - 4.90	4.20 - 5.80	m/cumm
Hemoglobin - Male	14.80	14.20	14.00 - 15.00	13.20 - 17.10	g/dl
Hematocrit - Male	45.30	41.60	40.00 - 48.00	38.50 - 50.00	%
MCV	92.90	90.40	82.00 - 89.90	80.00 - 100.00	fL
MCH	30.30	30.90	28.00 - 31.90	27.00 - 33.00	pg
MCHC	32.60	34.10	32.00 - 35.00	32.00 - 36.00	g/dL
RDW	14.10	12.40	11.70 - 13.00	11.00 - 15.00	%
Platelets	187.00	217.00	155.00 - 385.00	140.00 - 400.00	k/cumm
Total WBCs	4.00	4.30	5.50 - 7.50	3.80 - 10.80	k/cumm
Neutrophils	42.80	43.40	40.00 - 60.00	38.00 - 74.00	%
Lymphocytes	44.30	43.00	24.00 - 44.00	14.00 - 46.00	%
Monocytes	7.90	8.20	0.00 - 7.00	4.00 - 13.00	%
Eosinophils	3.40	4.50	0.00 - 3.00	0.00 - 3.00	%

Biomarker	Previous May 20 2017	Current Aug 14 2018	Optimal range	Standard range	Units
Basophils	1.60	0.90	0.00 - 1.00	0.00 - 1.00	%

Blood Test Score Report

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

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

Biomarker	Lab result	Optimal range		% deviation	Optimal range
		Low	High		Low High
Triglycerides	107.00	70.00	80.00	320	
Cholesterol - Total	203.00	160.00	180.00	165	
Sex Hormone Binding Globulin - Male	50.00	30.00	40.00	150	
Anion gap	14.60	7.00	12.00	102	
Calcium/Phosphorus Ratio	2.90	2.30	2.70	100	
Eosinophils	4.50	0.00	3.00	100	
Insulin - Fasting	6.40	2.00	5.00	97	
Cholesterol/HDL Ratio	4.10	0.00	3.00	87	
Glucose	90.00	75.00	86.00	86	
Potassium	4.60	4.00	4.50	70	
Monocytes	8.20	0.00	7.00	67	
LDL Cholesterol	133.00	0.00	120.00	61	
Triglyceride/HDL Ratio	2.18	0.00	2.00	59	
MCV	90.40	82.00	89.90	56	
Homocysteine	7.30	0.00	7.20	51	
Lymphocytes	43.00	24.00	44.00	45	
Hs CRP - Male	0.50	0.00	0.55	41	
Basophils	0.90	0.00	1.00	40	
Calcium/Albumin Ratio	2.16	0.00	2.60	33	
Fibrinogen	283.00	200.00	300.00	33	
Estradiol - Male	28.00	20.00	30.00	30	
ALT (SGPT)	22.00	10.00	26.00	25	
MCH	30.90	28.00	31.90	24	
MCHC	34.10	32.00	35.00	20	
Hemoglobin A1C	5.20	4.60	5.50	17	
Chloride	104.00	100.00	106.00	17	
Bilirubin - Indirect	0.50	0.10	0.70	17	
Bilirubin - Total	0.60	0.10	0.90	12	
Free T4	1.30	1.00	1.50	10	
Free T3	3.30	3.00	3.50	10	
Sodium	139.00	135.00	142.00	7	
RBC - Male	4.60	4.20	4.90	7	

Biomarker	Lab result	Optimal range		% deviation	Optimal range
		Low	High		Low High
eGFR Non-Afr. American	107.00	90.00	120.00	7	
RDW	12.40	11.70	13.00	4	
Bilirubin - Direct	0.10	0.00	0.19	3	
TIBC	300.00	250.00	350.00	0	
Globulin - Total	2.60	2.40	2.80	0	
T3 Uptake	31.00	27.00	35.00	0	
Vitamin D (25-OH)	74.00	50.00	100.00	-2	
Albumin/Globulin Ratio	1.70	1.40	2.10	-7	
% Transferrin saturation	26.00	20.00	35.00	-10	
Total T4	8.30	6.00	11.90	-11	
GGT	17.00	10.00	30.00	-15	
Uric Acid - Male	4.30	3.50	5.90	-17	
Free Thyroxine Index (T7)	2.60	1.70	4.60	-19	
Albumin	4.30	4.00	5.00	-20	
BUN/Creatinine Ratio	11.68	10.00	16.00	-22	
Ferritin	41.00	30.00	70.00	-22	
Platelets	217.00	155.00	385.00	-23	
Hemoglobin - Male	14.20	14.00	15.00	-30	
Hematocrit - Male	41.60	40.00	48.00	-30	
Reverse T3	13.00	10.00	25.00	-30	
Phosphorus	3.20	3.00	4.00	-30	
Neutrophils	43.40	40.00	60.00	-33	
Total T3	103.00	90.00	168.00	-33	
PSA - Total	0.40	0.00	2.60	-35	
AST (SGOT)	12.00	10.00	26.00	-38	
Calcium	9.30	9.20	10.00	-38	
Sodium/Potassium Ratio	30.21	30.00	35.00	-46	
TSH	1.31	1.30	3.00	-49	
Protein - Total	6.90	6.90	7.40	-50	
CO2	25.00	25.00	30.00	-50	
Creatinine	0.77	0.80	1.10	-60	
LDH	131.00	140.00	200.00	-65	
Iron - Serum	78.00	85.00	130.00	-66	
BUN	9.00	10.00	16.00	-67	
Magnesium	2.10	2.20	2.50	-83	
HDL Cholesterol	49.00	55.00	70.00	-90	
Total WBCs	4.30	5.50	7.50	-110	
Alk Phos	51.00	70.00	100.00	-113	
Testosterone - Bioavailable Male	162.00	375.00	575.00	-156	
Testosterone Total - Male	439.00	700.00	900.00	-180	
Testosterone - Free Male	46.50	150.00	224.00	-190	
DHEA-S - Male	75.00	350.00	490.00	-246	
Progesterone - Male	0.50	1.00	1.20	-300	

Blood Test History

Key

- Optimal
- Above / Below optimal
- Above / Below standard
- Alarm high / Alarm low

The Blood Test History Report lists the results of your client'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.

Biomarker	Latest 2 Test Results	
	May 20 2017	Aug 14 2018
Glucose	94.00	90.00
Hemoglobin A1C	5.70	5.20
Insulin - Fasting	7.00	6.40
BUN	7.00	9.00
Creatinine	0.86	0.77
BUN/Creatinine Ratio	8.13	11.68
eGFR Non-Afr. American	103.00	107.00
eGFR African American	120.00	
PSA - Total	0.50	0.40
Sodium	139.00	139.00
Potassium	4.70	4.60
Chloride	104.00	104.00
CO2	28.00	25.00
Sodium/Potassium Ratio	29.57	30.21
Anion gap	11.70	14.60
Uric Acid - Male	5.10	4.30
Protein - Total	6.60	6.90
Albumin	4.40	4.30
Globulin - Total	2.20	2.60

Biomarker	Latest 2 Test Results	
	May 20 2017	Aug 14 2018
Albumin/Globulin Ratio	2.00	1.70
Calcium	9.50	9.30
Phosphorus	3.20	3.20
Magnesium	2.20	2.10
Calcium/Albumin Ratio	2.15	2.16
Calcium/Phosphorus Ratio	2.96	2.90
Alk Phos	47.00	51.00
AST (SGOT)	15.00	12.00
ALT (SGPT)	25.00	22.00
GGT	17.00	17.00
LDH	137.00	131.00
Bilirubin - Total	1.30	0.60
Bilirubin - Direct	0.20	0.10
Bilirubin - Indirect	1.10	0.50
Iron - Serum	144.00	78.00
Ferritin	54.00	41.00
TIBC	285.00	300.00
% Transferrin saturation	51.00	26.00
Cholesterol - Total	180.00	203.00
Triglycerides	100.00	107.00
LDL Cholesterol	109.00	133.00
HDL Cholesterol	51.00	49.00
Cholesterol/HDL Ratio	3.50	4.10
Triglyceride/HDL Ratio	1.96	2.18
TSH	1.40	1.31
Total T4	8.20	8.30
Free T4	1.10	1.30

Biomarker	Latest 2 Test Results	
	May 20 2017	Aug 14 2018
Total T3	104.00	103.00
Free T3	3.20	3.30
Reverse T3	19.00	13.00
T3 Uptake	31.00	31.00
Free Thyroxine Index (T7)	2.50	2.60
Hs CRP - Male	0.50	0.50
Homocysteine	8.80	7.30
Fibrinogen	295.00	283.00
Vitamin D (25-OH)	35.00	74.00
Vitamin B12	1058.00	
DHEA-S - Male	62.00	75.00
Testosterone Total - Male	535.00	439.00
Testosterone - Free Male	74.90	46.50
Testosterone - Bioavailable Male		162.00
Sex Hormone Binding Globulin - Male	47.00	50.00
Estradiol - Male	42.00	28.00
Progesterone - Male		0.50
RBC - Male	4.88	4.60
Hemoglobin - Male	14.80	14.20
Hematocrit - Male	45.30	41.60
MCV	92.90	90.40
MCH	30.30	30.90
MCHC	32.60	34.10
RDW	14.10	12.40
Platelets	187.00	217.00
Total WBCs	4.00	4.30
Neutrophils	42.80	43.40

Biomarker	Latest 2 Test Results	
	May 20 2017	Aug 14 2018
Lymphocytes	44.30	43.00
Monocytes	7.90	8.20
Eosinophils	3.40	4.50
Basophils	1.60	0.90

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	Below standard	Below optimal	Optimal	Above optimal	Above standard	Alarm high	Total
0	0	13	47	10	5	0	75

Above Optimal

107.00
mg/dL

TRIGLYCERIDES

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

203.00
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. An 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.

50.00
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.

14.60
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.

2.90
ratio

CALCIUM/PHOSPHORUS RATIO

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

4.50
%

EOSINOPHILS

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

6.40
µIU/ml

INSULIN - FASTING

insulin is the hormone released 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.

4.10
Ratio

CHOLESTEROL/HDL RATIO

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%.

90.00
mg/dL

GLUCOSE

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, into glucose. Increased blood glucose is associated with type 1 & 2 diabetes, metabolic syndrome, and insulin resistance.

4.60
mEq/L

POTASSIUM

Potassium is one of the main electrolytes in the body. Due to the critical functions of potassium for human metabolism and physiology, it is essential for the body to maintain optimal serum levels even though a small concentration is found outside of the cell. Potassium levels should always be viewed in relation to the other electrolytes. Potassium concentration is greatly influenced by adrenal hormones. Increased levels are associated with adrenal insufficiency and may also be elevated in dehydration.

8.20
%

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.

133.00
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.

2.18
ratio

TRIGLYCERIDE/HDL RATIO

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

90.40
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.

7.30
µmol/L

HOMOCYSTEINE

Homocysteine is a molecule formed from the incomplete metabolism of the amino acid methionine. Deficiencies in Vitamins B6, B12 and folate cause methionine to be converted into homocysteine. Homocysteine increases the risk of cardiovascular disease by causing damage to the endothelial lining of the arteries, especially in the heart. Increased levels of homocysteine are associated with an increased risk of cardiovascular disease and stroke, as well as cancer, depression and inflammatory bowel disease.

Below Optimal

0.50
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.

75.00
mcg/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 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 order to maximize the anti-aging effects.

46.50
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.

439.00
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.

162.00
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.

51.00
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.

4.30
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, an immune insufficiency and may be seen in patients eating a raw food diet.

49.00
mg/dL

HDL CHOLESTEROL

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

2.10
mg/dl

MAGNESIUM

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.

9.00
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 difestive enzymes called pancreatic insufficiency and a diet low in protein.

78.00
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.

0.77
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.

131.00
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.

4

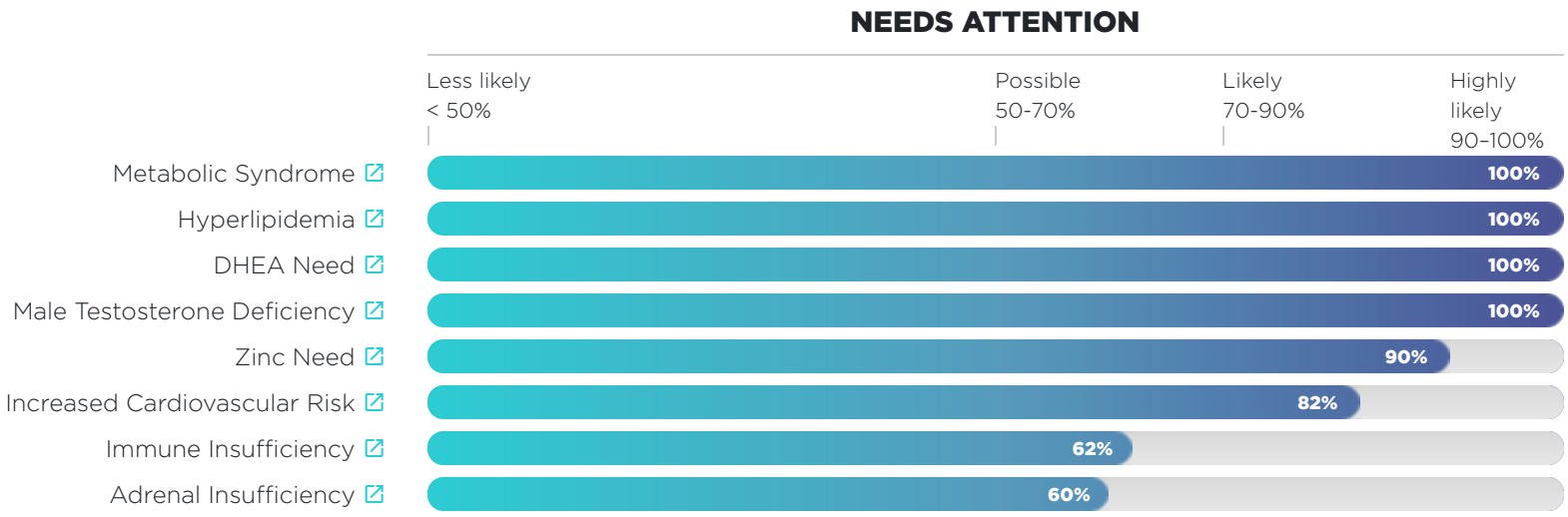
The Health Improvement Plan takes all the information on this report and focuses on the top areas that need the most attention.

Health Improvement Plan

Health Improvement

The Health Improvement Plan takes all the information on this report and focuses on the top areas that need the most attention.

Each area of Health Improvement 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 Improvement Details

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

METABOLIC SYNDROME

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

Rationale

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

HYPERLIPIDEMIA

The results of this blood test indicate a tendency towards hyperlipidemia, which has been shown to increase the risk of developing atherosclerotic coronary artery disease. There is a need for cardiovascular support, especially support to help lower excessive blood fats.

Rationale

Cholesterol - Total ↑, Triglycerides ↑, LDL Cholesterol ↑, Cholesterol/HDL Ratio ↑, HDL Cholesterol ↓

DHEA NEED

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 ↓

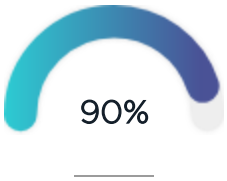
MALE TESTOSTERONE DEFICIENCY

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 ↓

ZINC NEED

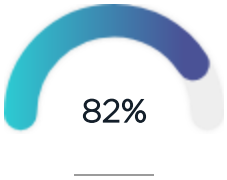


The results of this blood test indicate that this patient's zinc levels might be lower than optimal and shows a need for zinc supplementation.

Rationale

Alk Phos ↓

INCREASED CARDIOVASCULAR RISK

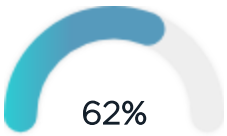


The results of this blood test indicate a higher than optimal cardiovascular risk for this patient and shows a need for cardiovascular support.

Rationale

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

IMMUNE INSUFFICIENCY

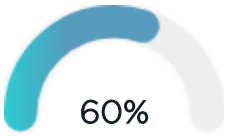


The results of this blood test indicate a tendency towards immune insufficiency and a need for immune support.

Rationale

Total WBCs ↓, Alk Phos ↓

ADRENAL INSUFFICIENCY



The results of this blood test indicate a tendency towards adrenal insufficiency and a need for adrenal gland support.

Rationale

Potassium ↑, Cholesterol - Total ↑, Triglycerides ↑, DHEA-S - 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.

ADDITIONAL LIPID TESTING

The results of this blood test indicate that this patient may be dealing with hyperlipidemia, which may be causing the biomarkers in the "Rationale" section are out of the optimal range. If you haven't done so already, you may want to consider running additional lipid tests such as a VAP test to get more information on the nature of the hyperlipidemia and it's associated cardiovascular disease risk. The VAP Test is an expanded lipid panel that directly measures LDL, HDL, VLDL, Total cholesterol and triglyceride levels.The test also measures the following: The LDL particle density (clusters of small, dense LDL greatly increase the risk of cardiovascular disease). It also measures all the important lipoprotein subclasses: HDL2 (the most protective form of HDL), HDL3 (not as protective as HDL2), Intermediate Density Lipoproteins IDLs (these are often elevated in people with a family history of diabetes) and Very Low Density Lipoproteins (VLDL1, VLDL2, VLDL3). Knowing the different fractions of VLDL is important because high levels of VLDL3 put your patients at a greater risk of cardiovascular disease. Finally, the test measures Lipoprotein (a) (Lp(a)), high levels of which are a very strong risk factor for heart attacks and strokes.

Rationale

Cholesterol - Total ↑,Triglycerides ↑,LDL Cholesterol ↑,Cholesterol/HDL Ratio ↑,HDL Cholesterol ↓

ZINC DEFICIENCY

The results of this blood test indicate that this patient may be dealing with a zinc deficiency because the alk phos level is decreased. We cannot tell categorically that your patient has a zinc deficiency because there are no tests specifically testing for zinc levels on a common Chemistry Screen. The likelihood of zinc deficiency increases with the presence of clinical signs of zinc deficiency: white spots on nails, reduced sense of smell or taste, cuts that are slow to heal, acne, increased susceptibility to colds, infections, and flu, and for our male patient's prostatic hypertrophy. If you suspect zinc deficiency, you may want to follow up with an in-office Zinc Taste Test or check White Blood cell or Red Blood cell zinc levels, which may be decreased.

Rationale

Alk Phos ↓

MALE HORMONE DYSFUNCTION

The results of this blood test indicate that this patient may be dealing with an imbalance in male hormone regulation because a number of the biomarkers listed under "Rationale" are out of the optimal range. A blood test can tell us about trends towards male hormone dysfunction but you may want to do a Male Hormone Salivary test to give you more information on the type and severity of the issue.

Rationale

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

INTESTINAL PARASITES

The results of this blood test indicate that this patient may be dealing with intestinal parasites because a number of biomarkers on the blood test associated with intestinal parasites, such as the ones listed in the "Rationale" section, may be out of optimal range. A blood test cannot tell what parasites your patient may be dealing with or even if your patient has an intestinal parasite so you may want to do further testing or evaluation to rule this out. This may include a thorough investigation of the subjective signs and symptoms associated with parasites and/or stool testing for ova and parasites.

Rationale

Eosinophils ↑ ,Monocytes ↑

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.

GLUCOSE ↑
(90.00 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 (> 86 mg/dL or 4.77 mmol/L) and Hemoglobin A1C (> 5.5% or 0.055) are both elevated, 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. 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 CO_2 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.

INSULIN - FASTING ↑

(6.40 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.

BUN ↓

(9.00 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).

CREATININE ↓
(0.77 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.

POTASSIUM ↑
(4.60 mEq/L)

Adrenal Fatigue and Adrenal Insufficiency
Adrenal fatigue and adrenal insufficiency causes a decrease in the secretions of both the glucocorticoid and mineralcorticoid hormones. A decrease in aldosterone, the major mineralcorticoid, from adrenal fatigue and adrenal insufficiency has an impact on potassium metabolism. Decreased aldosterone levels will cause a decrease in the amount of renal potassium excretion, which will cause an increase in serum potassium. If the potassium levels (>4.5) are increased along with a normal or decreased sodium (< 135) and/or chloride (<100), adrenal fatigue and adrenal insufficiency is possible. The sodium:potassium ratio will also be decreased. Other values that may be out of balance include decreased aldosterone and cortisol levels. Urinary chloride will be increased. Adrenal fatigue and adrenal insufficiency can be confirmed with salivary cortisol studies.

Dehydration
If potassium is increased (>4.5) suspect dehydration. Dehydration is a very common problem and should be factored into your blood chemistry and CBC analysis. Suspect a short-term (acute) dehydration if there is an increased HGB (>14.5 or 145 in women or 15 or 150 in men) and/or HCT (>44 or 0.44 in women and >48 or 0.48 in men) along with an increased RBC count (>4.5 in women and >4.9 in men). A relative increase in sodium (>142) and potassium (>4.5) can be noted as well. Suspect a long-term (chronic) dehydration if any of the above findings are accompanied by an increased albumin (>4.8 or 48 g/L), BUN (>16 or 5.71 mmol/L), and/or serum protein (>7.4 or 74 g/L).

Tissue destruction
Potassium is an intracellular ion. An increase in tissue destruction can cause an increase in serum potassium levels as the potassium is leached out of the damaged cells. LDH (> 200) levels may also be elevated. Follow-up suspected tissue destruction with serum protein and LDH isoenzyme electrophoresis, which can help pin point the specific tissue that is being affected.

Metabolic Acidosis
Metabolic acidosis will drive potassium out of the cell, thus causing an increase in serum potassium.

ANION GAP ↑
(14.60 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 CO_2 (<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 CO_2 (<25) and an increased chloride (>106).

MAGNESIUM ↓
(2.10 mg/dl)

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

CALCIUM/PHOSPHORUS RATIO ↑

(2.90 ratio)

A high calcium/phosphorus ratio favors deposition of calcium into the soft tissue. This deposition will decrease the availability of ionized calcium and reduce the serum calcium reading.

Indicative of Excess Calcium and Decreased Phosphorus
An increased Calcium:Phosphorus ratio above 2.7 indicates that there is either excess serum calcium or decreased serum phosphorus, or both. Therefore, we need to look at the clinical implications of elevated calcium and decreased phosphorus.

Parathyroid Hyperfunction
Parathyroid hyperfunction will cause an increase in PTH levels, which can lead to significantly increased serum calcium above the normal reference range. If the serum calcium is significantly increased above the *normal* reference range (>10.6 or 2.65 mmol/L) with a decreased phosphorus (<3.0 or <0.97 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.

Thyroid dysfunction (primary or secondary)
Serum calcium may be increased in either primary thyroid hypofunction or secondary thyroid hypofunction due to anterior pituitary hypofunction. With primary hypothyroidism the calcium levels may be increased (>10.0 or 2.5 mmol/L) along with an increased TSH (>2.0). With secondary thyroid hypofunction due to anterior pituitary hypofunction, the calcium levels may be increased (>10.0 or 2.5 mmol/L) along with a decreased TSH (<1.3).

Tissue/Cell Damage
Increased serum levels of calcium (>10.0 or 2.5 mmol/L) is associated with tissue or cell damage due to a disruption in the cellular membrane. Calcium is a vital component of the interstitial matrix where it facilitates cell to cell adhesion and communication. Calcium will be released into the serum if this matrix is disrupted. Space-occupying lesions should be considered and ruled out with appropriate examination and testing.

Hyperinsulinism
Phosphate crosses the cell membrane with glucose. Hyperinsulinism, therefore, will cause an increased uptake of glucose by the cells and will also increase phosphorus uptake, possibly contributing to a decreased serum phosphorus 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 after a meal high in refined carbohydrates. A diet high in refined carbohydrates and sugars will deplete phosphorus stores and other important co-factors for carbohydrate metabolism.

ALK PHOS ↓

(51.00 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 an increased alkaline phosphatase with a zinc taste test.

LDH ↓

(131.00 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.

IRON - SERUM ↓

(78.00 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.

CHOLESTEROL - TOTAL ↑

(203.00 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.

TRIGLYCERIDES ↑

(107.00 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.

LDL CHOLESTEROL ↑

(133.00 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.

HDL CHOLESTEROL ↓

(49.00 mg/dL)

Hyperlipidemia and atherosclerosis
If HDL is less than 25% of the total cholesterol, then there is a strong clinical indication that hyperlipidemia is present. If the serum triglycerides (>80 or >0.90 mmol/L) and LDL (>100 or 2.59 mmol/L) are also increased, hyperlipidemia is likely present and atherosclerosis should be ruled-out.

Diets high in refined carbohydrates
The Standard American Diet (SAD), which is very high in refined carbohydrates, can contribute to decreased HDL levels (< 55 or < 1.42 mmol/L)

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

Oxidative stress
Unoxidized cholesterol, including HDL cholesterol, acts as an antioxidant and a free radical scavenger in the body, so decreased levels put the body at risk for developing oxidative stress, especially lipid peroxidation, and increases the chance of free radical induced diseases.

Heavy metal/Chemical overload
Patients with historically low HDL and total cholesterol levels may be more prone to heavy metal and chemical toxins due to poor cell membrane integrity. This is irrespective of level of exposure, but related more to susceptibility of the individual patient. This may also leave patients at an increased risk for developing neoplasm.

Fatty liver (early development) and Liver congestion
If HDL levels are decreased (< 55 or < 1.42 mmol/L), and LDL (>100 or 2.59 mmol/L), triglyceride (>80 or >0.90 mmol/L) and total cholesterol levels (>180 or 4.66 mmol/L) are increased, then the early development of fatty liver is possible. Liver congestion, due to the fatty liver, should be considered if total cholesterol is above 220 or 5.69 mmol/L, triglycerides are increased (>80 or >0.90 mmol/L), and the SGPT/ALT is below 10. Fatty liver is caused by obesity, excessive alcohol consumption, prescription drugs (e.g. steroids), iron overload, solvent exposure, and rapid weight loss. Fatty changes to the liver tissue can impair the liver's detoxification ability. The degree of fatty liver changes is directly related to the amount of obesity. Fatty liver and liver congestion increases the risk of insulin resistance, hypertension, Metabolic Syndrome, and type II diabetes mellitus.

Hyperthyroidism
The increased metabolic activity found in hyperthyroidism can lead to decreased HDL levels. The body preferentially uses fatty acids, which are transported via lipoproteins, for energy in this heightened metabolic state.

Lack of exercise/ sedentary lifestyle
A sedentary lifestyle has been shown to decrease HDL levels. Increasing cardiovascular and resistance exercise is a very good way to elevate HDL levels.

CHOLESTEROL/HDL RATIO ↑

(4.10 Ratio)

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

TRIGLYCERIDE/HDL RATIO ↑

(2.18 ratio)

Increased Risk of Insulin Resistance and Type II Diabetes
An increased Triglyceride:HDL ratio is significantly associated with an increased risk for developing insulin resistance and Type II Diabetes.

HOMOCYSTEINE ↑

(7.30 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

DHEA-S - MALE ↓

(75.00 mcg/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.

TESTOSTERONE TOTAL - MALE ↓

(439.00 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

TESTOSTERONE - FREE MALE ↓

(46.50 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 - BIOAVAILABLE MALE ↓

(162.00 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

SEX HORMONE BINDING GLOBULIN - MALE ↑

(50.00 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.

PROGESTERONE - MALE ↓

(0.50 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.

MCV ↑
(90.40 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).

TOTAL WBCS ↓

(4.30 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.

MONOCYTES ↑

(8.20 %)

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 (>7) towards the end of an infection.

Liver dysfunction

Not a primary marker but if an increased monocyte count (>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 upon early prognostic indicators. The liver should always be viewed in the context of the hepato-biliary tree.

Intestinal parasites

If the monocyte count is elevated (>7) with increased eosinophils (>3) and increased basophils (>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 monocyte count (>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 monocyte count (>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

EOSINOPHILS ↑

(4.50 %)

Intestinal parasites

It is important to do further studies if the eosinophil count 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. If increased eosinophils (>3), increased basophils (>1), and increased monocytes (>7) intestinal parasites are probable and should be ruled out.

Food and Environmental allergy/sensitivity

An increased eosinophil count (>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, Shell fish, 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 eosinophil count (>3) is 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.

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