

ways2well

Blood Chemistry Analysis Functional Health Report



Practitioner Report

Prepared for Tyler Anderton
28 year old male born May 26,
1995
Fasting

Requested by Danese Rexroad Optimal DX



Collected Date Jun 03, 2023

Lab Quest

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What's Inside?

An introduction to Functional Blood Chemistry Analysis and this report.

An in-depth functional system and nutrient evaluation.

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

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

Introduction

- 1 What's Inside?
- 3 FBCA Introduction
- 4 Practitioner Report



Functional Blood Chemistry Analysis (FBCA)

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

WHY BLOOD TESTING?

Blood has a lot to tell us about our state of health and the blood chemistry and CBC / hematology test is the most commonly ordered medical lab test worldwide. These blood tests are an integral part of Western clinical medicine and are used to aid in the diagnostic decision-making process. Patients understand and are educated that blood testing is the norm for health assessment.

However, many people feel unwell long before a traditional blood test becomes diagnostic. More often than not, our patients are told by their physician that "everything on your blood test looks normal."

"NORMAL" IS NOT OPTIMAL

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

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

THE FUNCTIONAL APPROACH

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

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

THE FUNCTIONAL HEALTH REPORT

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

SUMMARY

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

Practitioner Report

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

DANESE REXROAD OPTIMAL DX

THE FUNCTIONAL HEALTH REPORT

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

The analytical and interpretive software analyzes the blood test data for its hidden meaning and reveals the subtle, web-like patterns hidden within the numbers that signal the first stages of functional change in the body.

ASSESSMENT

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

Systems and Accessory Reports show the level of dysfunction that exists in the various physiological systems in the body.

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

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

ANALYSIS

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

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

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

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

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

HEALTH CONCERNS

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

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

APPENDIX

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



An in-depth functional system and nutrient evaluation.

Assessment

- 6 Functional Body Systems
- 10 Accessory Systems
- 13 Nutrient Status
- 15 Nutrient Deficiencies
- 17 Clinical Dysfunctions

Functional Body Systems

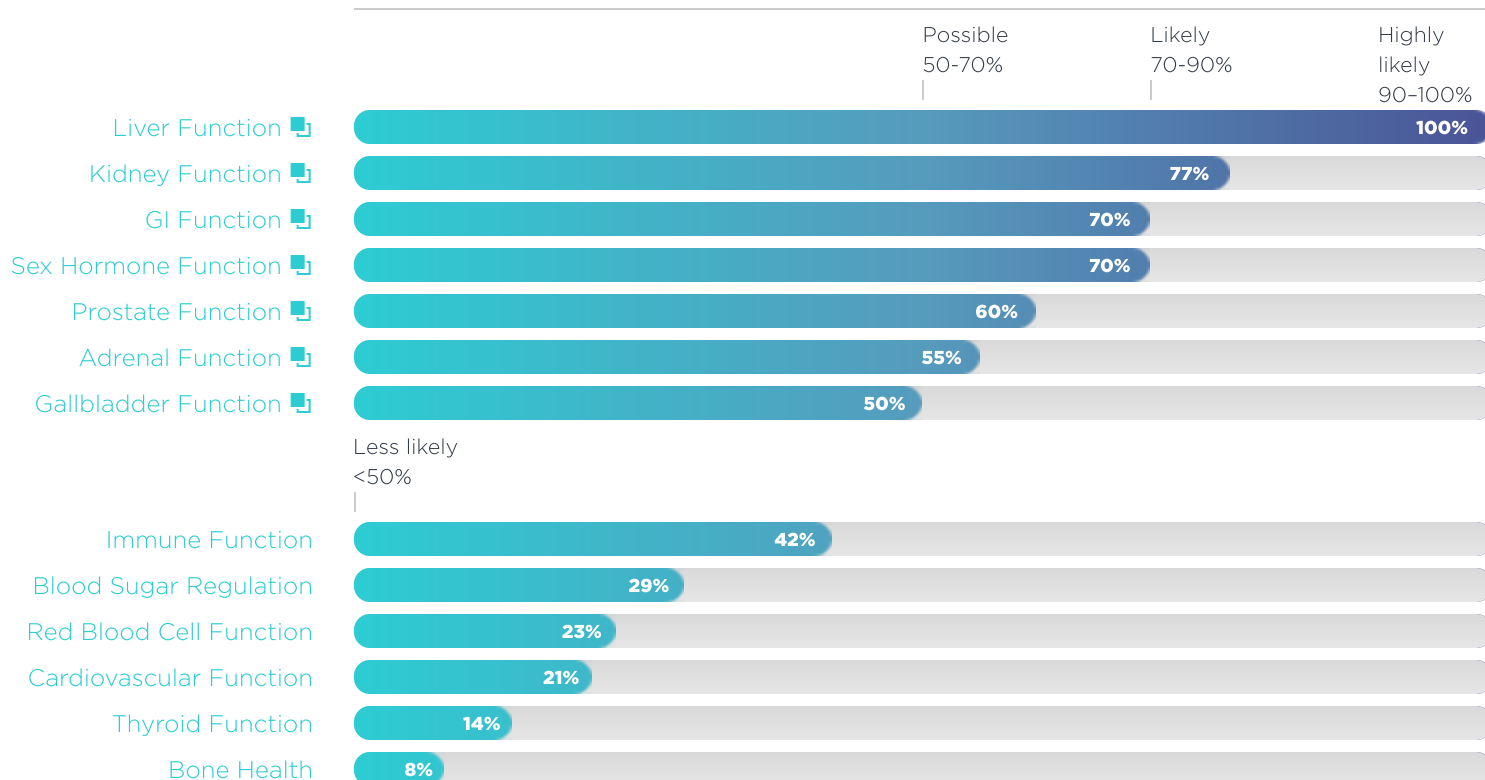
The Functional Body System results represent an algorithmic analysis of this blood test. These results have been converted into your client's individual Functional Body Systems Report based on our latest research.

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

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

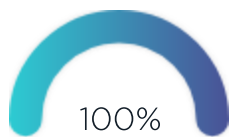
Each Body System that has a probability of dysfunction above 50% is included in the section that follows so you can read a detailed description and individual explanation of the results shown in this report.

PROBABILITY OF DYSFUNCTION



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.



100%

Dysfunction Highly Likely.
Much improvement
required.

LIVER FUNCTION

Your patient has a high Liver Function score, which indicates that there is likely a high risk of liver dysfunction. Please refer to the "Clinical Dysfunctions" report to get a sense of what might be causing the Liver Function to be so high. Factors affecting liver function include **Fatty Liver** (steatosis), **Hepatitis** (inflammation of the hepatic cells from infections, toxins, etc.), **liver cell damage from cirrhosis, infection, alcohol, chemical damage, or hepatic necrosis** or a **decrease in either phase 1 or phase 2 liver detoxification pathways**. Liver dysfunction may negatively impact the immune system and the body's energy systems.

Rationale

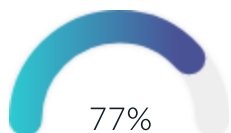
ALT ↑, AST ↑, Cholesterol - Total ↓, Ferritin ↑, Protein - Total ↓

Biomarkers considered

ALT, BUN, Albumin, Globulin - Total, Albumin : Globulin, Alk Phos, AST, Bilirubin - Total, Cholesterol - Total, Ferritin, Protein - Total

Patient result not available - consider running in future tests:

LDH, Iron - Serum, Bilirubin - Direct, GGT, AST : ALT



77%

Dysfunction Likely
Improvement required.

KIDNEY FUNCTION

It is likely that your patient is trending towards dysfunction in their Kidney system. This could be emerging renal insufficiency, liver dysfunction, dehydration, or the very earliest stages of kidney disease. Please refer to the "Clinical Dysfunctions" report to get a sense of the probability of dysfunction in these "conditions".

Rationale

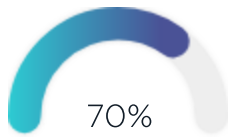
BUN ↑, Creatinine ↑, BUN : Creatinine ↑, eGFR ↓, AST ↑

Biomarkers considered

BUN, Creatinine, BUN : Creatinine, eGFR, AST, Magnesium - Serum

Patient result not available - consider running in future tests:

Phosphorus, eGFR African American, Uric Acid - Male, LDH



70%

Dysfunction Likely
Improvement required.

GI FUNCTION

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

Rationale

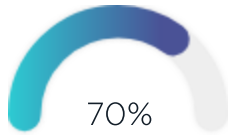
BUN ↑, Protein - Total ↓, Albumin ↓, MCV ↑, Eosinophils - % ↑, Basophils - % ↑, Total WBCs ↓

Biomarkers considered

BUN, Protein - Total, Globulin - Total, Albumin, Alk Phos, MCV, Eosinophils - %, Basophils - %, Creatinine, Chloride, Calcium, Total WBCs

Patient result not available - consider running in future tests:

Phosphorus, Iron - Serum, Anion Gap, Gastrin



70%

Dysfunction Likely
Improvement required.

SEX HORMONE FUNCTION

It is likely that your patient is trending towards sex hormone dysfunction. This could be emerging deficiencies in the following sex hormones: testosterone total, testosterone free, DHEA-S, progesterone, Sex Hormone Binding Globulin (SHBG), and estradiol. Please refer to the "Blood Test Results" report to get a sense of the probability of deficiency in these biomarkers.

Rationale

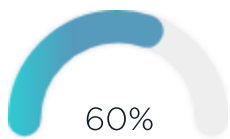
Testosterone Free - Male ↓, Testosterone Total - Male ↓, DHEA-S - Male ↓

Biomarkers considered

Estradiol - Male, Testosterone Free - Male, Testosterone Total - Male, Sex Hormone Binding Globulin - Male, DHEA-S - Male

Patient result not available - consider running in future tests:

Progesterone - Male



60%

Dysfunction Possible
There may be
improvement needed in
certain areas.

PROSTATE FUNCTION

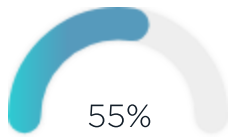
It is possible that your patient is in the early stages of prostate dysfunction, which is causing an increase in their Prostate Function score. While this may not require immediate attention, you may want to keep an eye on this on future blood tests.

Rationale

Creatinine ↑, Monocytes - % ↑

Biomarkers considered

Creatinine, PSA - Total, Monocytes - %



55%

Dysfunction Possible
There may be
improvement needed in
certain areas.

ADRENAL FUNCTION

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

Rationale

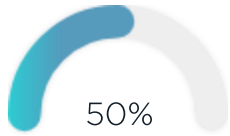
Cortisol - Total/AM ↓, BUN ↑,
Cholesterol - Total ↓,
Triglycerides ↓, DHEA-S - Male ↓

Biomarkers considered

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

Patient result not available - consider running in future tests:

Sodium : Potassium, Cortisol - PM



50%

Dysfunction Possible
There may be
improvement needed in
certain areas.

GALLBLADDER FUNCTION

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

Rationale

Cholesterol - Total ↓, ALT ↑,
Triglycerides ↓

Biomarkers considered

Alk Phos, Cholesterol - Total, ALT, Bilirubin - Total, Triglycerides

Patient result not available - consider running in future tests:

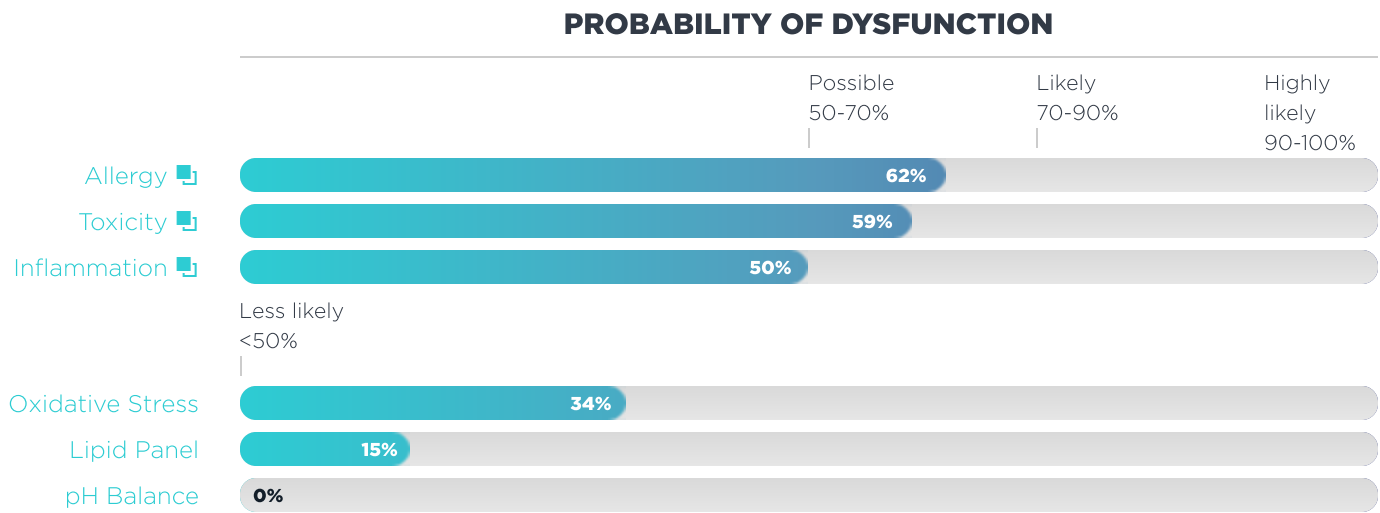
GGT, AST : ALT, Gastrin, LDH, Bilirubin - Direct

Accessory Systems

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

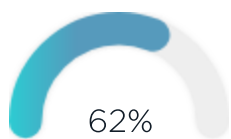
The Accessory Systems Report represents an algorithmic analysis of this blood test. These results have been converted into an individualized risk evaluation based on the latest research.

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



Accessory Systems Details

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



62%

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

ALLERGY

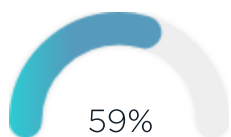
It is possible that your patient is in the early stages of allergies, which is causing an increase in biomarkers such as eosinophils and basophils that can increase in association with food allergies and/or sensitivities. While this may not require immediate attention, you may want to keep an eye on this on future blood tests.

Rationale

Eosinophils - % ↑, Basophils - % ↑

Biomarkers considered

Eosinophils - %, Eosinophils - Absolute, Basophils - %, Basophils - Absolute



59%

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

TOXICITY

Your patient may be in the early stages of an increased toxicity burden, causing an increase in their Toxicity score. While this may not require immediate attention, you may want to keep an eye on this on future blood tests.

Rationale

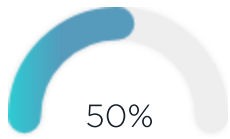
Cholesterol - Total ↓, HDL Cholesterol ↓, Platelets ↓

Biomarkers considered

Lymphocytes - Absolute, Globulin - Total, Cholesterol - Total, HDL Cholesterol, Platelets, Lymphocytes - %, MCH, MCHC

Patient result not available - consider running in future tests:

GGT, Bilirubin - Direct, Uric Acid - Male, Homocysteine



50%

Dysfunction Possible.

There may be improvement needed in certain areas.

INFLAMMATION

Your patient may be starting to show signs of inflammation. The Inflammation Score can help us pinpoint biomarkers associated with inflammation that are starting to increase. While this may not require immediate attention, you may want to keep an eye on this on future blood tests.

Rationale

Cholesterol - Total ↓, Basophils - % ↑, ALT ↑

Biomarkers considered

Cholesterol - Total, Triglycerides, HDL Cholesterol, Ferritin, Lymphocytes - %, Basophils - %, ALT, RDW, Vitamin D (25-OH)

Patient result not available - consider running in future tests:

Hs CRP - Male, Fibrinogen, Homocysteine, Myeloperoxidase (MPO), Uric Acid - Male, LDH, Iron - Serum, ESR - Male, Creatine Kinase, C-Reactive Protein

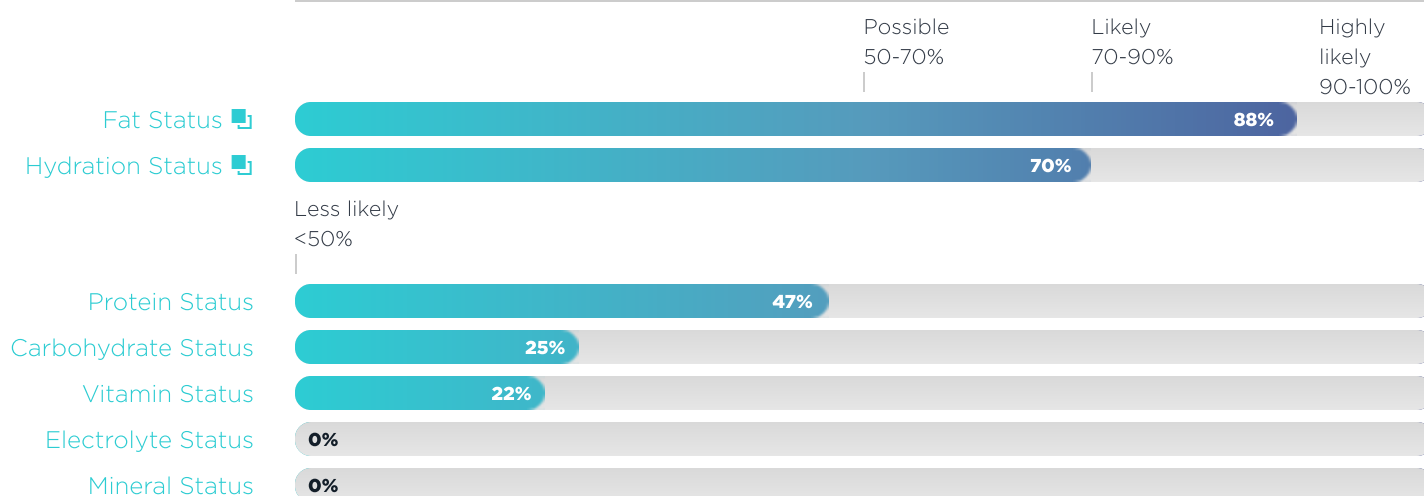
Nutrient Status

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

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

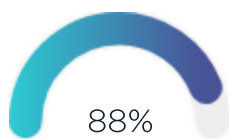
Each Nutrient category that has a probability of dysfunction above 50% is included in the section that follows so you can read a detailed description and individual explanation of the results shown in this report.

PROBABILITY OF DYSFUNCTION



Nutrient Status Details

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



88%

Dysfunction Likely.
Improvement required.

FAT STATUS

Your patient has a high Fat Status score, which gives us an assessment of a fatty acid deficiency in your patient. This may be due to a deficiency of fat in the diet itself or an inability of the body to handle the fats consumed in the diet. For many patients, a deficiency in Essential Fatty Acids (EFAs) is not due to deficiencies in the diet but rather a problem in the biliary tree, making it harder for the body to handle the fats already present in the diet. With a high Fat Status score, thoroughly assess your patient's biliary system and check their diet to make sure they are consuming enough EFAs.

Rationale

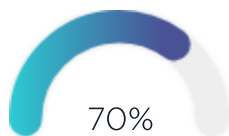
Cholesterol - Total ↓ ,
Triglycerides ↓

Biomarkers considered

Cholesterol - Total, Triglycerides,
Bilirubin - Total

**Patient result not available -
consider running in future
tests:**

GGT



70%

Dysfunction Likely.
Improvement required.

HYDRATION STATUS

Your patient is likely trending towards dehydration, causing an increase in their Hydration score. Dehydration is a very common problem and often shows up on standard blood chemistry and CBC tests as increased albumin, BUN or Urea, Sodium, Potassium, RBC count, Hemoglobin, and Hematocrit. Insufficient water intake and/or excessive use of diuretics such as over-the-counter and prescription drugs, botanical medicines, caffeine, etc. are the most common causes of dehydration and may be a cause of your patient's increasing Hydration Status score.

Rationale

BUN ↑ , RBC - Male ↑ ,
Hemoglobin - Male ↑ ,
Hematocrit - Male ↑

Biomarkers considered

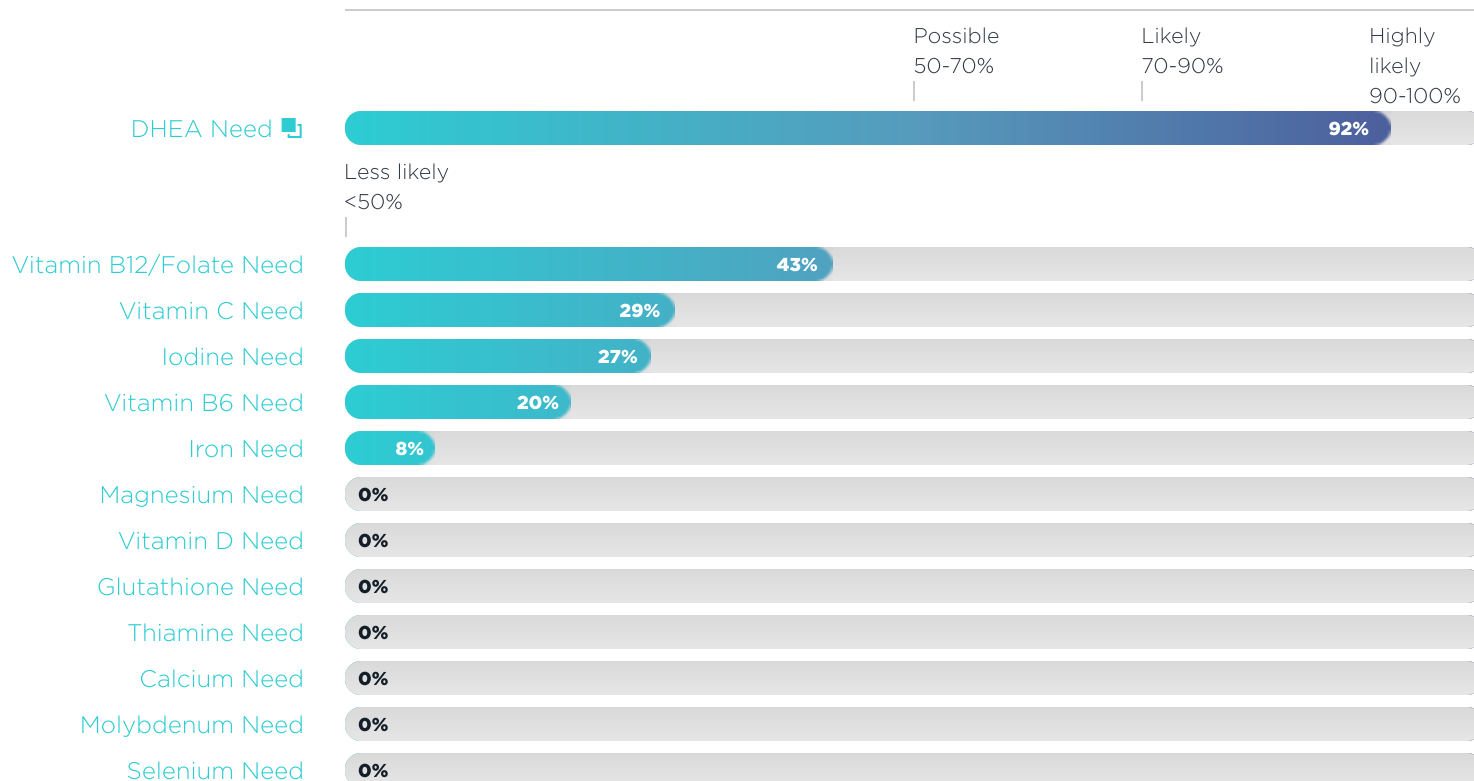
Albumin, BUN, Sodium,
Potassium, Protein - Total, RBC -
Male, Hemoglobin - Male,
Hematocrit - Male

Individual Nutrient Deficiencies

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

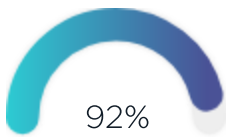
Each individual Nutrient Deficiency that has a probability of dysfunction above 50% is included in the section that follows so you can read a detailed description and individual explanation of the results shown in this report.

PROBABILITY OF DEFICIENCY



Individual Nutrient Deficiency Details

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



92%

DHEA NEED

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

Rationale

DHEA-S - Male 

Biomarkers considered

DHEA-S - Male

Deficiency Highly Likely.
Much improvement
required.

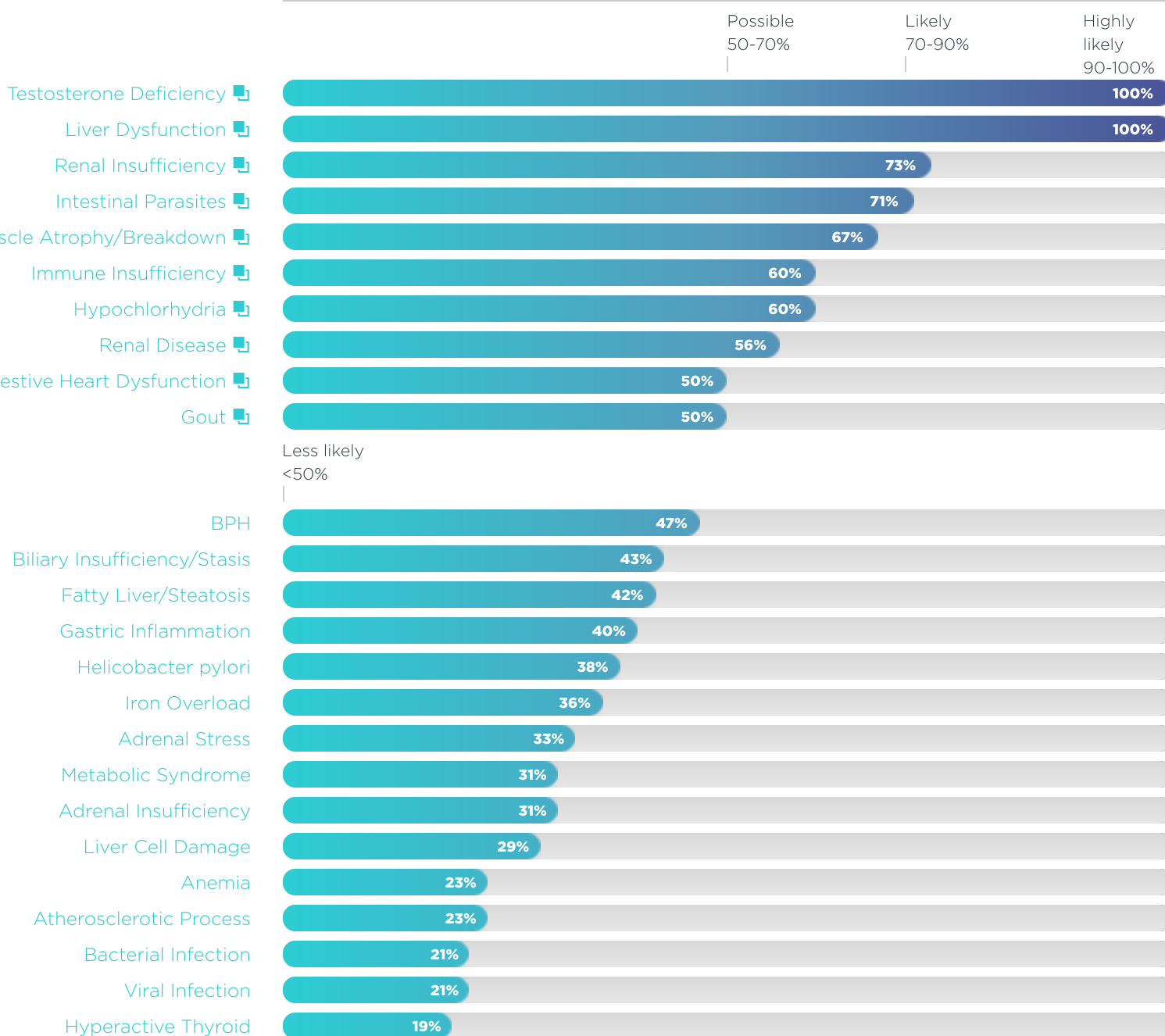
Clinical Dysfunctions

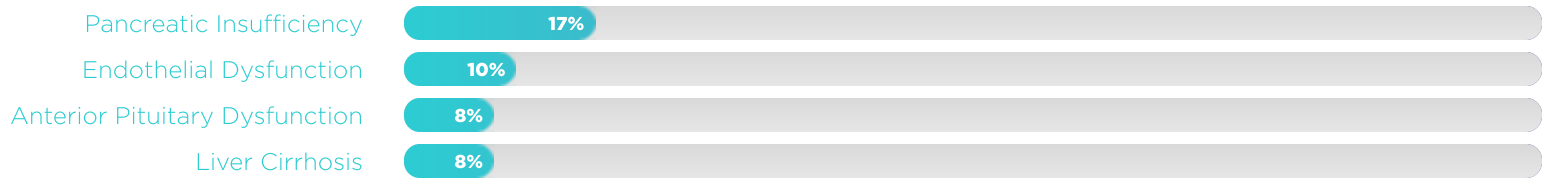
Advanced practitioner only report

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

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

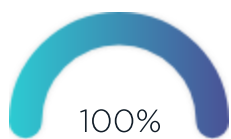
PROBABILITY OF DYSFUNCTION





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.



100%

Dysfunction Highly Likely.
Much improvement
required.

TESTOSTERONE DEFICIENCY

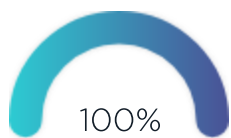
Consider a functional testosterone deficiency with a decreased total testosterone and a decreased free testosterone.

Rationale

Testosterone Total - Male ↓,
Testosterone Free - Male ↓

Biomarkers considered

Testosterone Total - Male,
Testosterone Free - Male



100%

Dysfunction Highly Likely.
Much improvement
required.

LIVER DYSFUNCTION

Suspect liver dysfunction if SGPT/ALT is increased along with an increased SGOT/AST and an increased GGTP. The likelihood of liver dysfunction increases with a decreased serum albumin, an increased serum alkaline phosphatase, an increased serum bilirubin, a decreased cholesterol, an increased globulin and an increased LDH. Additional biomarkers that may be out of range with liver dysfunction are an increased ferritin, an increased serum iron, a decreased total protein, an increased MCV and a decreased triglyceride.

Rationale

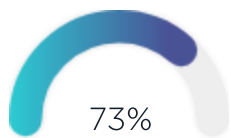
ALT ↑, Albumin ↓, Ferritin ↑,
, Protein - Total ↓, AST ↑,
Cholesterol - Total ↓

Biomarkers considered

ALT, Albumin, Ferritin, Alk Phos,
BUN, Albumin : Globulin, Protein
- Total, AST, Bilirubin - Total,
Cholesterol - Total, Globulin -
Total

Patient result not available - consider running in future tests:

Bilirubin - Direct, Iron - Serum,
GGT, LDH, AST : ALT



73%

Dysfunction Likely.
Improvement required.

RENAL INSUFFICIENCY

Suspect renal insufficiency if there is an increased BUN with a normal or increased serum Creatinine, a normal to increased Uric Acid, and an increased serum phosphorous. EGFR may be slightly elevated. LDH and SGOT/AST will usually be normal.

Rationale

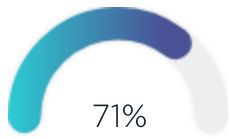
BUN ↑, Creatinine ↑, eGFR ↓

Biomarkers considered

BUN, Creatinine, eGFR

Patient result not available - consider running in future tests:

Phosphorus, eGFR African
American, Uric Acid - Male



71%

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 biomarkers 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

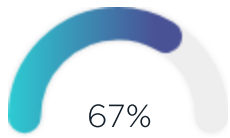
Eosinophils - % ↑, Basophils - % ↑, Monocytes - % ↑

Biomarkers considered

Eosinophils - %, Basophils - %, Basophils - Absolute, Eosinophils - Absolute, Monocytes - Absolute, Hemoglobin - Male, Hematocrit - Male, Monocytes - %

Patient result not available - consider running in future tests:

Iron - Serum



67%

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

MUSCLE ATROPHY/BREAKDOWN

Consider muscle atrophy or muscle breakdown with a decreased serum creatinine along with an increased SGPT/ALT and SGOT/AST.

Rationale

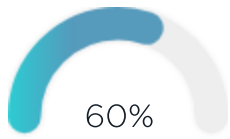
AST ↑, ALT ↑

Biomarkers considered

Creatinine, AST, ALT

Patient result not available - consider running in future tests:

Creatine Kinase



60%

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

IMMUNE INSUFFICIENCY

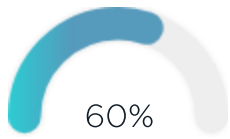
Consider an immune insufficiency with a decreased total WBC count along with a decreased albumin, a decreased total globulin, and a decreased alkaline phosphatase level.

Rationale

Total WBCs ↓, Albumin ↓

Biomarkers considered

Total WBCs, Albumin, Globulin - Total, Alk Phos



60%

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

HYPOCHLORHYDRIA

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

Rationale

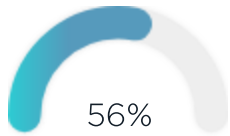
BUN ↑, Protein - Total ↓, Albumin ↓, MCV ↑

Biomarkers considered

BUN, Protein - Total, Globulin - Total, Albumin, Alk Phos, MCV, Calcium

Patient result not available - consider running in future tests:

Phosphorus, Iron - Serum, Anion Gap, Gastrin



56%

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

RENAL DISEASE

Consider a potential renal disease with an increased **BUN**, increased **serum creatinine**, decreased **EGFR**, and an increased **BUN/Creatinine ratio** all above the "normal" reference range. However, a **BUN/Creatinine ratio** below 10 could be associated with renal failure. Additional biomarkers that may be out of range above the "normal" reference range include an increased **uric acid**, increased **serum phosphorous**, increased **LDH**, increased **AST**, increased serum **magnesium**, and increased **potassium**. Suspected renal disease should be referred to a qualified practitioner if present.

Rationale

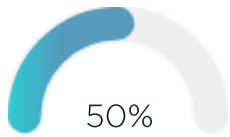
BUN ↑, Creatinine ↑, AST ↑

Biomarkers considered

BUN, Creatinine, eGFR, BUN : Creatinine, Potassium, AST, Magnesium - Serum

Patient result not available - consider running in future tests:

eGFR African American, Phosphorus, Uric Acid - Male, LDH



50%

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

CONGESTIVE HEART DYSFUNCTION

An increased SGOT/AST level can be an important clue to a developing congestive heart problem. Congestive Heart Disease (CHF) is a very common cardiovascular disease so its helpful to use Functional Blood Chemistry Analysis to catch it before it fully develops. If the SGOT/AST is increased higher than an accompanying SGPT/ALT increase with a normal to increased GGTP, increased alkaline phosphatase and a decreased CO₂ consider the possibility of a developing congestive heart problem. It is more likely if the patient also has an increased ESR, a normal to increased globulin, and an increased uric acid

Rationale

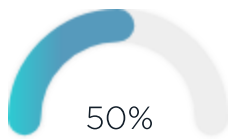
AST ↑, ALT ↑

Biomarkers considered

AST, CO₂, Globulin - Total, Alk Phos, ALT

Patient result not available - consider running in future tests:

Uric Acid - Male, ESR - Male



50%

Dysfunction Possible.

There may be improvement needed in certain areas.

GOUT

Gout is a condition in which uric acid crystals precipitate in the tissue, especially the big toe (tophi). Consider gout if there is an increased uric acid. The likelihood increases if there is also a decreased phosphorous, an increased total cholesterol, an increased BUN and a normal or increased creatinine.

Rationale

BUN ↑, Creatinine ↑

Biomarkers considered

BUN, Creatinine, Cholesterol - Total

Patient result not available - consider running in future tests:

Uric Acid - Male, Phosphorus



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

Analytics

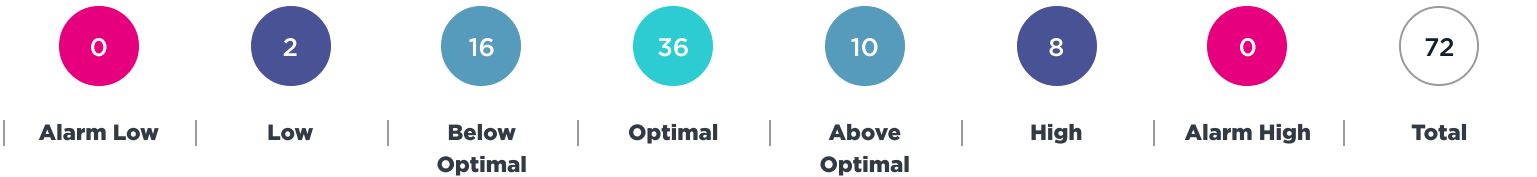
- 24 Blood Test Results
- 31 Blood Test Comparative
- 34 Blood Test Score
- 36 Blood Test History
- 40 Out of Optimal Range

Blood Test Results	Blood Test Comparative	Blood Test Score	Blood Test History	Out of Optimal Range
Blood Glucose Minerals Vitamins	Renal Liver and GB Hormones	Prostate Iron Markers CBC/Hematology	Electrolytes Lipids White Blood Cells	Proteins Thyroid

Blood Test Results

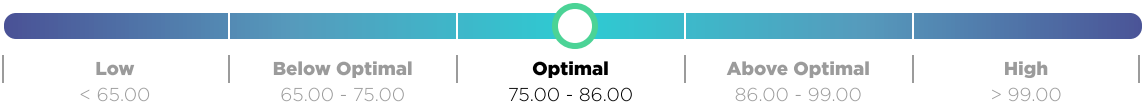
The Blood Test Results Report lists the results of your patient’s Chemistry Screen and CBC and shows you whether or not an individual biomarker is outside of the optimal range and/or outside of the clinical lab range. The biomarkers are grouped into their most common categories.

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



BLOOD GLUCOSE

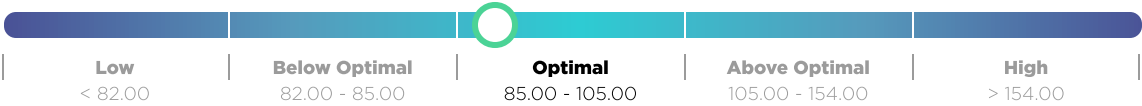
Glucose - Fasting
81.00 mg/dL



Hemoglobin A1C
4.70 %



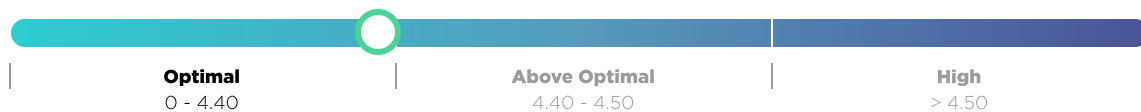
eAG
88.19 mg/dl



Insulin - Fasting
3.20 µIU/ml

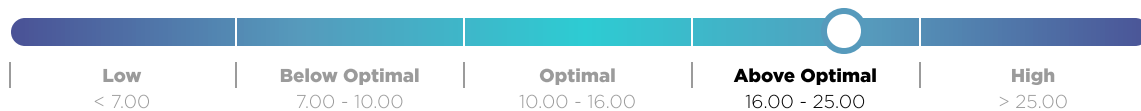



Triglyceride-Glucose Index
(TyG)
4.20 Index

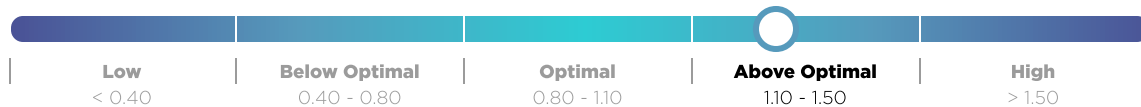



RENAL

BUN 
22.00 mg/dL



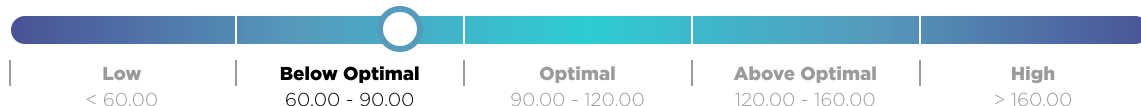
Creatinine 
1.24 mg/dL



BUN : Creatinine 
17.74 Ratio

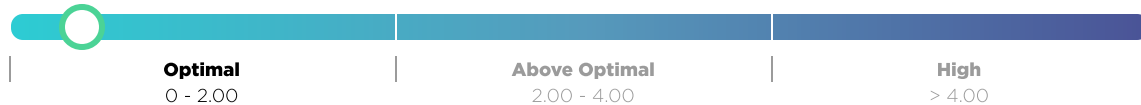


eGFR 
81.00 mL/min/1.73m2



PROSTATE

PSA - Total
0.41 ng/ml

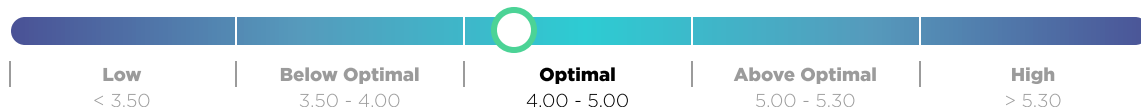


ELECTROLYTES

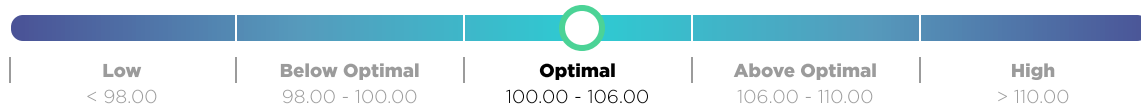
Sodium
139.00 mEq/L



Potassium
4.20 mEq/L




Chloride
103.00 mEq/L

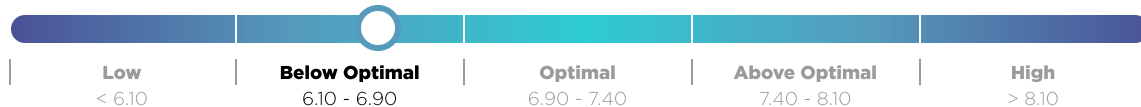



CO2
29.00 mEq/L

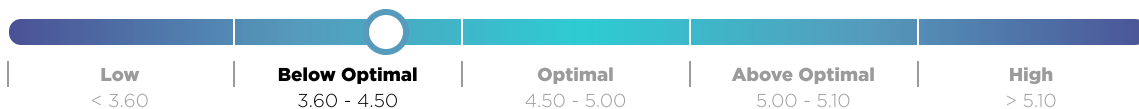


PROTEINS

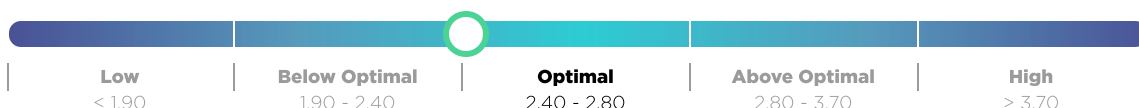
Protein - Total 
6.60 g/dL



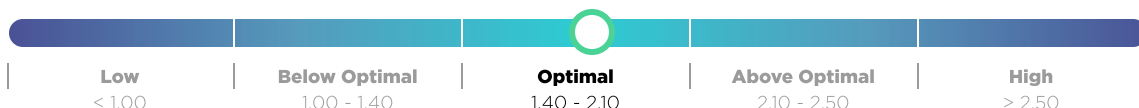
Albumin 
4.20 g/dL



Globulin - Total
2.40 g/dL

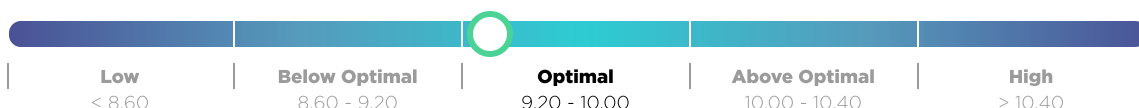


Albumin : Globulin
1.80 ratio



MINERALS

Calcium
9.30 mg/dL



Magnesium - Serum
2.20 mg/dL



Calcium : Albumin
2.21 ratio



LIVER AND GB

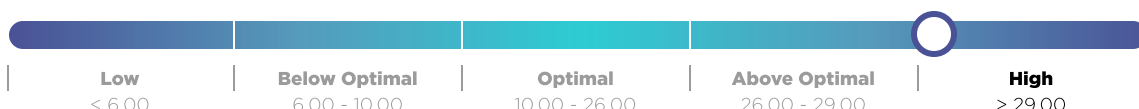
Alk Phos
46.00 IU/L



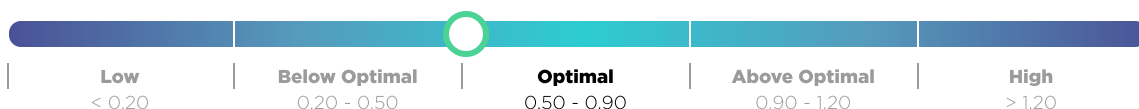
AST 
39.00 IU/L



ALT 
35.00 IU/L

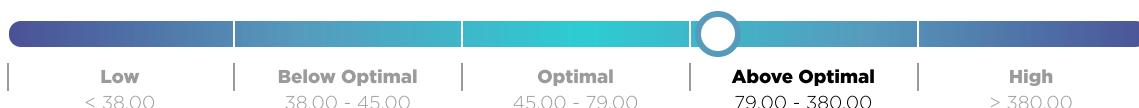


Bilirubin - Total
0.50 mg/dL



IRON MARKERS

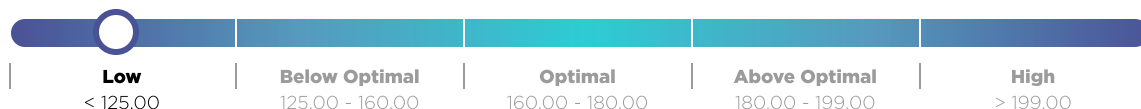
Ferritin 
117.00 ng/mL



LIPIDS

Cholesterol - Total 

117.00 mg/dL



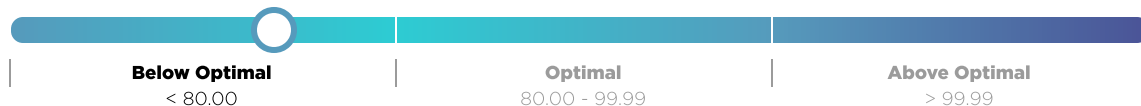
Triglycerides 

55.00 mg/dL



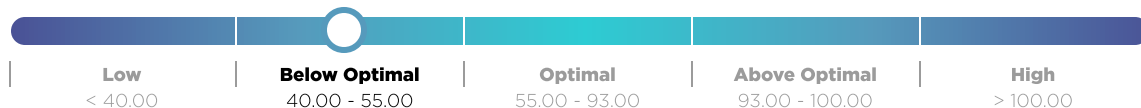
LDL Cholesterol 

56.00 mg/dL



HDL Cholesterol 

47.00 mg/dL



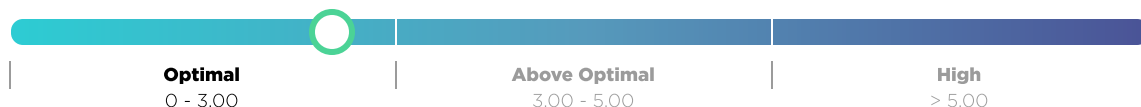
Non-HDL Cholesterol

70.00 mg/dL



Cholesterol : HDL

2.50 Ratio



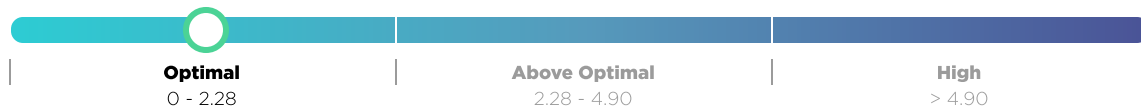
Triglyceride:HDL

1.17 ratio



LDL : HDL - Male

1.19 Ratio



THYROID

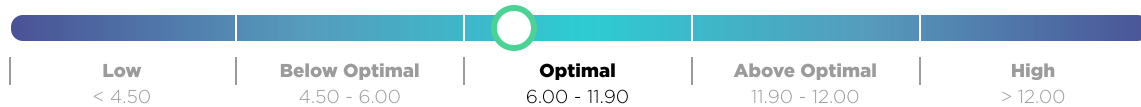
TSH

1.02 μ U/mL



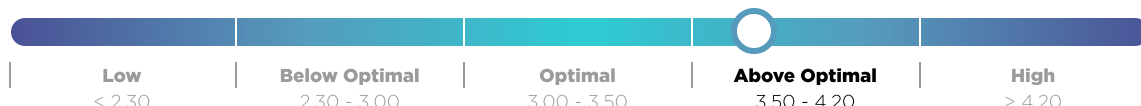
T4 - Total

7.20 μ g/dL



T3 - Free 

3.70 pg/ml



T3 Uptake

34.00 %



Free Thyroxine Index (T7)

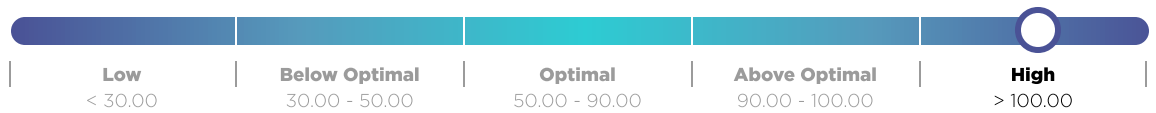
2.40 Index



VITAMINS

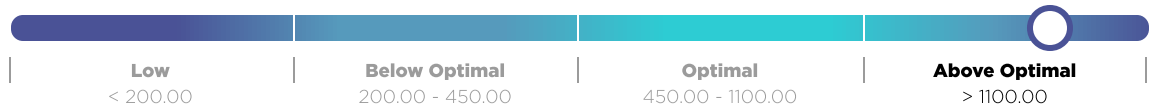
Vitamin D (25-OH)

115.00 ng/ml



Vitamin B12

1362.00 pg/ml



Folate - Serum

21.10 ng/ml



HORMONES

DHEA-S - Male

239.00 µg/dL



Testosterone Total - Male

617.00 ng/dl



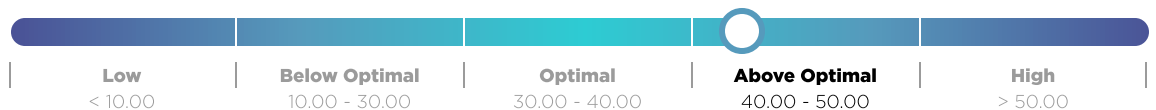
Testosterone Free - Male

71.20 pg/ml



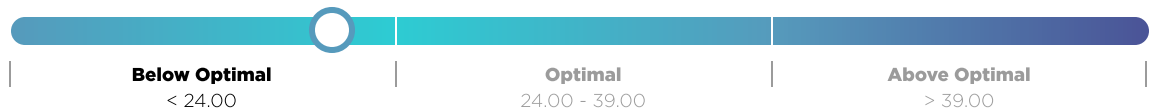
Sex Hormone Binding Globulin - Male

42.00 nmol/L



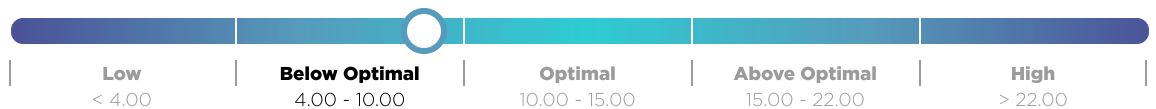
Estradiol - Male

20.00 pg/ml



Cortisol - Total/AM

9.00 µg/dL



Cortisol : DHEA-S

0.04 ratio



Testosterone Bioavailable - Male

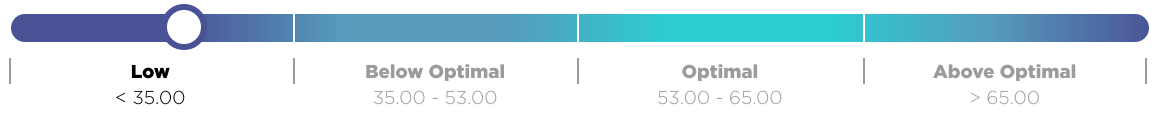
137.20 ng/dl



% Testosterone Bioavailable -

Male 

22.23 %



CBC/HEMATOLOGY

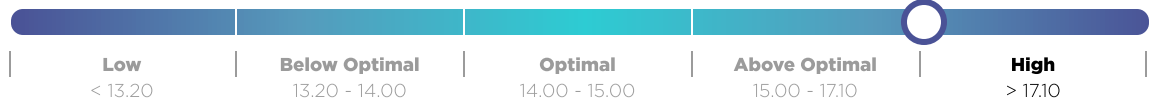
RBC - Male 

5.48 m/cumm



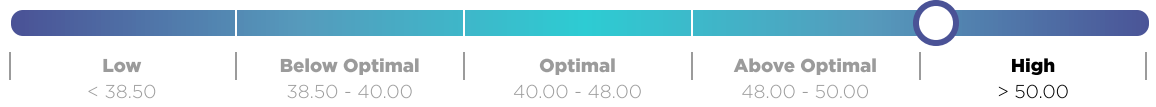
Hemoglobin - Male 

17.20 g/dl



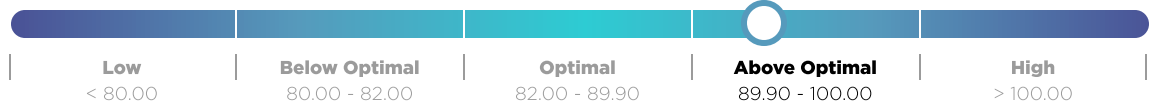
Hematocrit - Male 

51.10 %



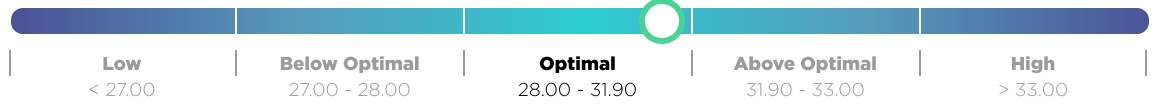
MCV 


93.20 fL



MCH

31.40 pg



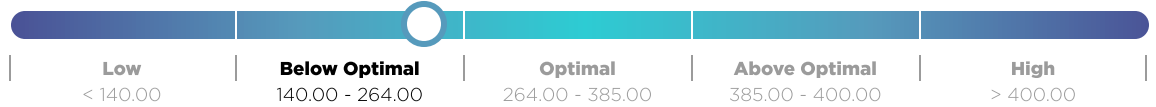
MCHC 

33.70 g/dL



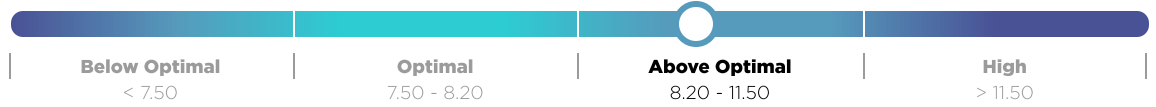
Platelets 

245.00 $10^3/\mu\text{L}$



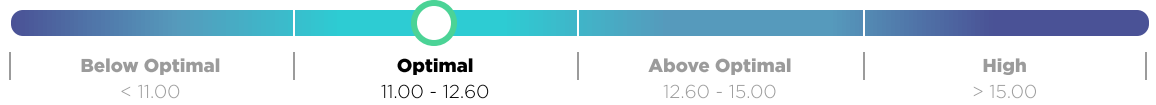
MPV 

9.60 fL



RDW

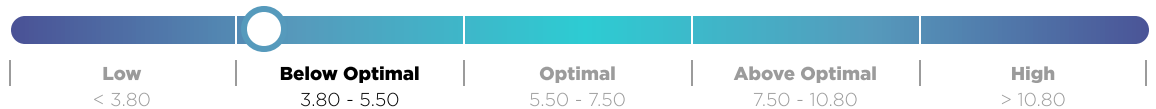
11.80 %



WHITE BLOOD CELLS

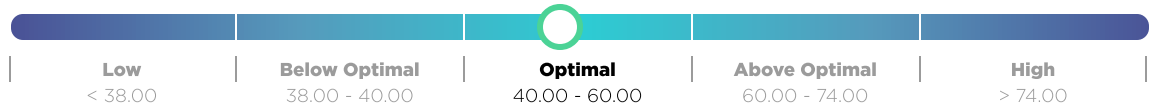
Total WBCs 

4.00 k/cumm

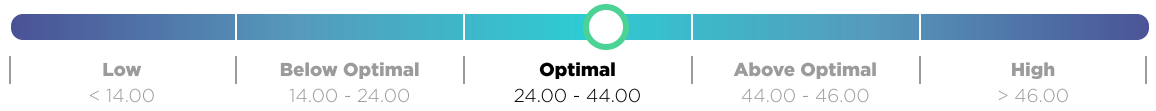


Neutrophils - %

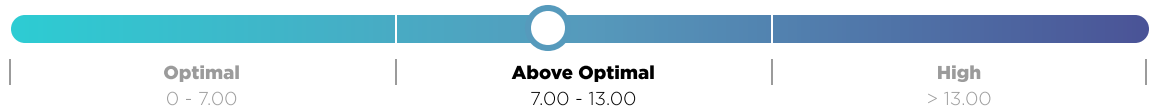
48.40 %



Lymphocytes - %
36.10 %



Monocytes - %
9.50 %



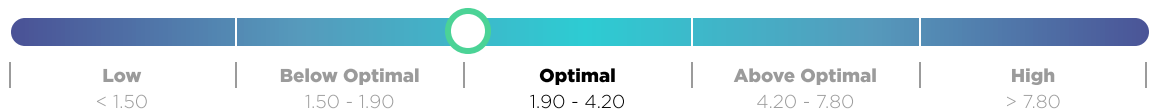
Eosinophils - %
4.00 %



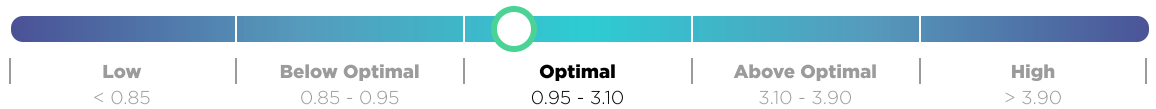
Basophils - %
2.00 %



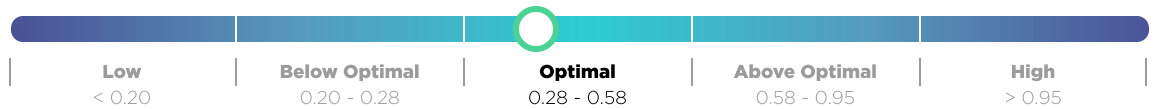
Neutrophils - Absolute
1.94 k/cumm



Lymphocytes - Absolute
1.44 k/cumm



Monocytes - Absolute
0.38 k/cumm



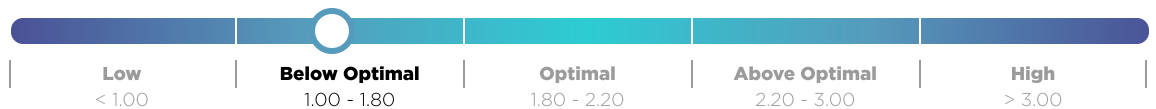
Eosinophils - Absolute
0.16 k/cumm



Basophils - Absolute
0.08 k/cumm



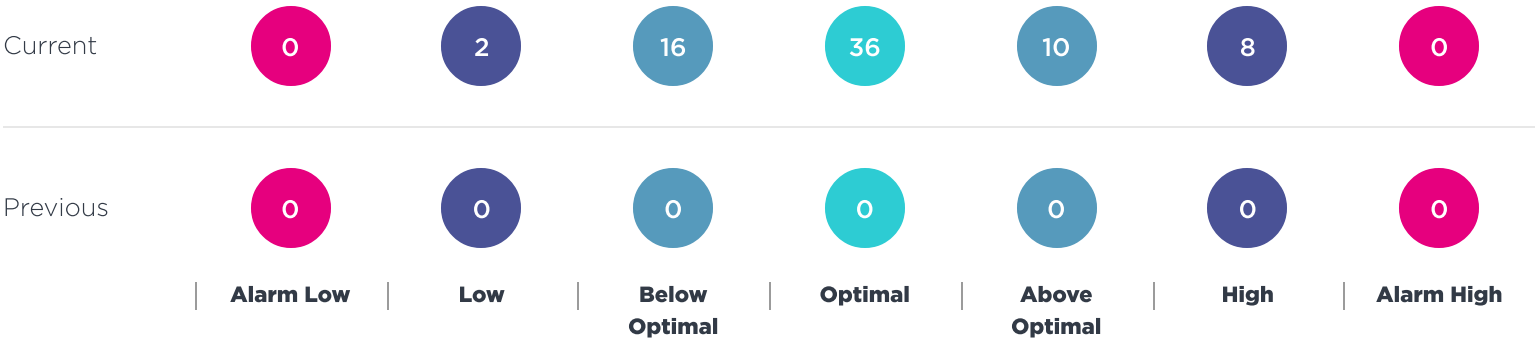
Neutrophil : Lymphocyte
1.35 Ratio














































Blood Test Results Comparative








The Blood Test Results Comparative Report lists the results of your patient’s latest and previous Chemistry Screen and CBC and shows you whether or not an individual biomarker is outside of the optimal range and/or outside of the clinical lab range.

Comparative total number of biomarkers by optimal range



Biomarker	Quest			
	Current Jun 03 2023	Optimal range	Standard range	Units
Glucose - Fasting	81.00	75.00 - 86.00	65.00 - 99.00	mg/dL
Hemoglobin A1C	4.70	4.60 - 5.30	0 - 5.70	%
eAG	88.19	85.00 - 105.00	82.00 - 154.00	mg/dl
Insulin - Fasting	3.20	2.00 - 5.00	0 - 19.60	µIU/ml
Triglyceride-Glucose Index (TyG)	4.20	0 - 4.40	0 - 4.50	Index
BUN	22.00 ↑	10.00 - 16.00	7.00 - 25.00	mg/dL
Creatinine	1.24 ↑	0.80 - 1.10	0.40 - 1.50	mg/dL
BUN : Creatinine	17.74 ↑	10.00 - 16.00	6.00 - 22.00	Ratio
eGFR	81.00 ↓	90.00 - 120.00	60.00 - 160.00	mL/min/1.73m2
PSA - Total	0.41	0 - 2.00	0 - 4.00	ng/ml
Sodium	139.00	135.00 - 142.00	135.00 - 146.00	mEq/L
Potassium	4.20	4.00 - 5.00	3.50 - 5.30	mEq/L
Chloride	103.00	100.00 - 106.00	98.00 - 110.00	mEq/L
CO2	29.00	25.00 - 30.00	19.00 - 30.00	mEq/L
Protein - Total	6.60 ↓	6.90 - 7.40	6.10 - 8.10	g/dL
Albumin	4.20 ↓	4.50 - 5.00	3.60 - 5.10	g/dL
Globulin - Total	2.40	2.40 - 2.80	1.90 - 3.70	g/dL
Albumin : Globulin	1.80	1.40 - 2.10	1.00 - 2.50	ratio

Biomarker	Quest			
	Current Jun 03 2023	Optimal range	Standard range	Units
Calcium 	9.30	9.20 - 10.00	8.60 - 10.40	mg/dL
Magnesium - Serum 	2.20	2.20 - 2.50	1.50 - 2.50	mg/dl
Calcium : Albumin 	2.21	0 - 2.60	0 - 2.60	ratio
Alk Phos 	46.00	45.00 - 100.00	36.00 - 130.00	IU/L
AST 	39.00 ↑ ↑	10.00 - 26.00	10.00 - 35.00	IU/L
ALT 	35.00 ↑ ↑	10.00 - 26.00	6.00 - 29.00	IU/L
Bilirubin - Total 	0.50	0.50 - 0.90	0.20 - 1.20	mg/dL
Ferritin 	117.00 ↑	45.00 - 79.00	38.00 - 380.00	ng/mL
Cholesterol - Total 	117.00 ↓ ↓	160.00 - 180.00	125.00 - 199.00	mg/dL
Triglycerides 	55.00 ↓	70.00 - 80.00	0 - 149.99	mg/dL
LDL Cholesterol 	56.00 ↓	80.00 - 99.99	0 - 99.99	mg/dL
HDL Cholesterol 	47.00 ↓	55.00 - 93.00	40.00 - 100.00	mg/dL
Non-HDL Cholesterol 	70.00	70.00 - 99.00	0 - 129.99	mg/dl
Cholesterol : HDL 	2.50	0 - 3.00	0 - 5.00	Ratio
Triglyceride:HDL 	1.17	0.50 - 1.90	0 - 2.00	ratio
LDL : HDL - Male 	1.19	0 - 2.28	0 - 4.90	Ratio
TSH 	1.02	1.00 - 2.00	0.40 - 4.50	μU/mL
T4 - Total 	7.20	6.00 - 11.90	4.50 - 12.00	μg/dL
T3 - Free 	3.70 ↑	3.00 - 3.50	2.30 - 4.20	pg/ml
T3 Uptake 	34.00	27.00 - 35.00	22.00 - 35.00	%
Free Thyroxine Index (T7) 	2.40	1.70 - 4.60	1.40 - 3.80	Index
Vitamin D (25-OH) 	115.00 ↑ ↑	50.00 - 90.00	30.00 - 100.00	ng/ml
Vitamin B12 	1362.00 ↑ ↑	450.00 - 1100.00	200.00 - 1100.00	pg/ml
Folate - Serum 	21.10	15.00 - 27.00	5.50 - 27.00	ng/ml
DHEA-S - Male 	239.00 ↓	350.00 - 690.00	85.00 - 690.00	μg/dL
Testosterone Total - Male 	617.00 ↓	700.00 - 1100.00	250.00 - 1100.00	ng/dl
Testosterone Free - Male 	71.20 ↓	150.00 - 224.00	46.00 - 224.00	pg/ml
Sex Hormone Binding Globulin - Male 	42.00 ↑	30.00 - 40.00	10.00 - 50.00	nmol/L
Estradiol - Male 	20.00 ↓	24.00 - 39.00	0 - 39.00	pg/ml
Cortisol - Total/AM 	9.00 ↓	10.00 - 15.00	4.00 - 22.00	μg/dL
Cortisol : DHEA-S 	0.04	0 - 0.09	0 - 0.09	ratio
Testosterone Bioavailable - Male 	137.20 ↓	375.00 - 575.00	110.00 - 575.00	ng/dl
% Testosterone Bioavailable - Male 	22.23 ↓ ↓	53.00 - 65.00	35.00 - 65.00	%
RBC - Male 	5.48 ↑	4.20 - 4.90	4.20 - 5.80	m/cumm
Hemoglobin - Male 	17.20 ↑ ↑	14.00 - 15.00	13.20 - 17.10	g/dl
Hematocrit - Male 	51.10 ↑ ↑	40.00 - 48.00	38.50 - 50.00	%
MCV 	93.20 ↑	82.00 - 89.90	80.00 - 100.00	fL
MCH 	31.40	28.00 - 31.90	27.00 - 33.00	pg
MCHC 	33.70 ↓	34.00 - 36.00	32.00 - 36.00	g/dL
Platelets 	245.00 ↓	264.00 - 385.00	140.00 - 400.00	10E3/μL
MPV 	9.60 ↑	7.50 - 8.20	7.50 - 11.50	fL
RDW 	11.80	11.00 - 12.60	11.00 - 15.00	%
Total WBCs 	4.00 ↓	5.50 - 7.50	3.80 - 10.80	k/cumm

Biomarker	Quest			
	Current Jun 03 2023	Optimal range	Standard range	Units
Neutrophils - % 	48.40	40.00 - 60.00	38.00 - 74.00	%
Lymphocytes - % 	36.10	24.00 - 44.00	14.00 - 46.00	%
Monocytes - % 	9.50 ↑	0 - 7.00	4.00 - 13.00	%
Eosinophils - % 	4.00 ↑ ↑	0 - 3.00	0 - 3.00	%
Basophils - % 	2.00 ↑ ↑	0 - 1.00	0 - 1.00	%
Neutrophils - Absolute 	1.94	1.90 - 4.20	1.50 - 7.80	k/cumm
Lymphocytes - Absolute 	1.44	0.95 - 3.10	0.85 - 3.90	k/cumm
Monocytes - Absolute 	0.38	0.28 - 0.58	0.20 - 0.95	k/cumm
Eosinophils - Absolute 	0.16	0 - 0.30	0 - 0.50	k/cumm
Basophils - Absolute 	0.08	0 - 0.10	0 - 0.20	k/cumm
Neutrophil : Lymphocyte 	1.35 ↓	1.80 - 2.20	1.00 - 3.00	Ratio

Blood Test Score Report

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

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

Biomarker	Lab result	Optimal range		% deviation	Optimal range	
		Low	High		Low	High
Hemoglobin - Male	17.20	14.00	15.00	270	<div><div></div></div>	
MPV	9.60	7.50	8.20	250	<div><div></div></div>	
Ferritin	117.00	45.00	79.00	162	<div><div></div></div>	
BUN	22.00	10.00	16.00	150	<div><div></div></div>	
Basophils - %	2.00	0	1.00	150	<div><div></div></div>	
RBC - Male	5.48	4.20	4.90	133	<div><div></div></div>	
AST	39.00	10.00	26.00	131	<div><div></div></div>	
Vitamin D (25-OH)	115.00	50.00	90.00	112	<div><div></div></div>	
ALT	35.00	10.00	26.00	106	<div><div></div></div>	
Creatinine	1.24	0.80	1.10	97	<div><div></div></div>	
MCV	93.20	82.00	89.90	92	<div><div></div></div>	
Vitamin B12	1362.00	450.00	1100.00	90	<div><div></div></div>	
T3 - Free	3.70	3.00	3.50	90	<div><div></div></div>	
Hematocrit - Male	51.10	40.00	48.00	89	<div><div></div></div>	
Monocytes - %	9.50	0	7.00	86	<div><div></div></div>	
Eosinophils - %	4.00	0	3.00	83	<div><div></div></div>	
BUN : Creatinine	17.74	10.00	16.00	79	<div><div></div></div>	
Sex Hormone Binding Globulin - Male	42.00	30.00	40.00	70	<div><div></div></div>	
Triglyceride-Glucose Index (TyG)	4.20	0	4.40	45	<div><div></div></div>	
T3 Uptake	34.00	27.00	35.00	38	<div><div></div></div>	
MCH	31.40	28.00	31.90	37	<div><div></div></div>	
Calcium : Albumin	2.21	0	2.60	35	<div><div></div></div>	
Cholesterol : HDL	2.50	0	3.00	33	<div><div></div></div>	
CO2	29.00	25.00	30.00	30	<div><div></div></div>	
Basophils - Absolute	0.08	0	0.10	30	<div><div></div></div>	
Lymphocytes - %	36.10	24.00	44.00	10	<div><div></div></div>	
Sodium	139.00	135.00	142.00	7	<div><div></div></div>	
Albumin : Globulin	1.80	1.40	2.10	7	<div><div></div></div>	
Glucose - Fasting	81.00	75.00	86.00	5	<div><div></div></div>	
Eosinophils - Absolute	0.16	0	0.30	3	<div><div></div></div>	
LDL : HDL - Male	1.19	0	2.28	2	<div><div></div></div>	
Folate - Serum	21.10	15.00	27.00	1	<div><div></div></div>	

Biomarker	Lab result	Optimal range		% deviation	Optimal range	
		Low	High		Low	High
Chloride	103.00	100.00	106.00	0		
RDW	11.80	11.00	12.60	0		
Triglyceride:HDL	1.17	0.50	1.90	-2		
Cortisol : DHEA-S	0.04	0	0.09	-6		
Neutrophils - %	48.40	40.00	60.00	-8		
Insulin - Fasting	3.20	2.00	5.00	-10		
Monocytes - Absolute	0.38	0.28	0.58	-17		
Free Thyroxine Index (T7)	2.40	1.70	4.60	-26		
Lymphocytes - Absolute	1.44	0.95	3.10	-27		
PSA - Total	0.41	0	2.00	-30		
T4 - Total	7.20	6.00	11.90	-30		
Potassium	4.20	4.00	5.00	-30		
eAG	88.19	85.00	105.00	-34		
Hemoglobin A1C	4.70	4.60	5.30	-36		
Calcium	9.30	9.20	10.00	-38		
TSH	1.02	1.00	2.00	-48		
Alk Phos	46.00	45.00	100.00	-48		
Neutrophils - Absolute	1.94	1.90	4.20	-48		
Globulin - Total	2.40	2.40	2.80	-50		
Bilirubin - Total	0.50	0.50	0.90	-50		
Magnesium - Serum	2.20	2.20	2.50	-50		
Non-HDL Cholesterol	70.00	70.00	99.00	-50		
MCHC	33.70	34.00	36.00	-65		
Platelets	245.00	264.00	385.00	-66		
Cortisol - Total/AM	9.00	10.00	15.00	-70		
Testosterone Total - Male	617.00	700.00	1100.00	-71		
HDL Cholesterol	47.00	55.00	93.00	-71		
Estradiol - Male	20.00	24.00	39.00	-77		
eGFR	81.00	90.00	120.00	-80		
DHEA-S - Male	239.00	350.00	690.00	-83		
Protein - Total	6.60	6.90	7.40	-110		
Albumin	4.20	4.50	5.00	-110		
Total WBCs	4.00	5.50	7.50	-125		
Testosterone Free - Male	71.20	150.00	224.00	-156		
Neutrophil : Lymphocyte	1.35	1.80	2.20	-162		
Testosterone Bioavailable - Male	137.20	375.00	575.00	-169		
LDL Cholesterol	56.00	80.00	99.99	-170		
Triglycerides	55.00	70.00	80.00	-200		
Cholesterol - Total	117.00	160.00	180.00	-265		
% Testosterone Bioavailable - Male	22.23	53.00	65.00	-306		


























Blood Test History



























The Blood Test History Report lists the results of your patient's Chemistry Screen and CBC tests side by side with the latest test listed on the right-hand side. This report allows you to compare results over time and see where improvement has been made and allows you to track progress.



Key

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

Biomarker	Latest Test Result Quest Jun 03 2023
Glucose - Fasting 	81.00
Hemoglobin A1C 	4.70
eAG 	88.19
Insulin - Fasting 	3.20
Triglyceride-Glucose Index (TyG) 	4.20
BUN 	22.00 ↑
Creatinine 	1.24 ↑
BUN : Creatinine 	17.74 ↑
eGFR 	81.00 ↓
PSA - Total 	0.41
Sodium 	139.00
Potassium 	4.20
Chloride 	103.00
CO2 	29.00
Protein - Total 	6.60 ↓
Albumin 	4.20 ↓
Globulin - Total 	2.40
Albumin : Globulin 	1.80

Biomarker	Latest Test Result Quest Jun 03 2023
Calcium 	9.30
Magnesium - Serum 	2.20
Calcium : Albumin 	2.21
Alk Phos 	46.00
AST 	39.00 ↑ ↑
ALT 	35.00 ↑ ↑
Bilirubin - Total 	0.50
Ferritin 	117.00 ↑
Cholesterol - Total 	117.00 ↓ ↓
Triglycerides 	55.00 ↓
LDL Cholesterol 	56.00 ↓
HDL Cholesterol 	47.00 ↓
Non-HDL Cholesterol 	70.00
Cholesterol : HDL 	2.50
Triglyceride:HDL 	1.17
LDL : HDL - Male 	1.19
TSH 	1.02
T4 - Total 	7.20
T3 - Free 	3.70 ↑
T3 Uptake 	34.00
Free Thyroxine Index (T7) 	2.40
Vitamin D (25-OH) 	115.00 ↑ ↑
Vitamin B12 	1362.00 ↑ ↑
Folate - Serum 	21.10
DHEA-S - Male 	239.00 ↓
Testosterone Total - Male 	617.00 ↓

Biomarker	Latest Test Result Quest Jun 03 2023
Testosterone Free - Male 	71.20 ↓
Sex Hormone Binding Globulin - Male 	42.00 ↑
Estradiol - Male 	20.00 ↓
Cortisol - Total/AM 	9.00 ↓
Cortisol : DHEA-S 	0.04
Testosterone Bioavailable - Male 	137.20 ↓
% Testosterone Bioavailable - Male 	22.23 ↓ ↓
RBC - Male 	5.48 ↑
Hemoglobin - Male 	17.20 ↑ ↑
Hematocrit - Male 	51.10 ↑ ↑
MCV 	93.20 ↑
MCH 	31.40
MCHC 	33.70 ↓
Platelets 	245.00 ↓
MPV 	9.60 ↑
RDW 	11.80
Total WBCs 	4.00 ↓
Neutrophils - % 	48.40
Lymphocytes - % 	36.10
Monocytes - % 	9.50 ↑
Eosinophils - % 	4.00 ↑ ↑
Basophils - % 	2.00 ↑ ↑
Neutrophils - Absolute 	1.94
Lymphocytes - Absolute 	1.44
Monocytes - Absolute 	0.38
Eosinophils - Absolute 	0.16

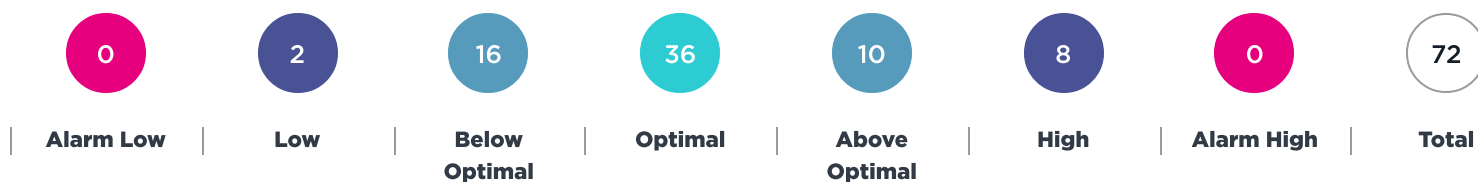
Biomarker	Latest Test Result
	Quest
	Jun 03 2023
Basophils - Absolute 	0.08
Neutrophil : Lymphocyte 	1.35 ↓

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 see a more detailed view of the blood test result itself.

Total number of biomarkers by optimal range



Above Optimal



HEMOGLOBIN - MALE

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



MPV

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

117.00
ng/mL

FERRITIN

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

22.00
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. Increased BUN may be due to increased production of urea by the liver or decreased excretion by the kidney. BUN is a test used predominantly to measure kidney function, where it will be increased. An increased BUN is also associated with dehydration and hypochlorhydria.

2.00
%

BASOPHILS - %

Basophils are a type of White Blood Cell, which will often be increased with tissue inflammation and is often seen with cases of intestinal parasites.

5.48
m/cumm

RBC - MALE

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

39.00
IU/L

AST

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

115.00
ng/ml

VITAMIN D (25-OH)

This vitamin D test measures for levels of 25-OH vitamin D and is a very good way to assess vitamin D status. An increased serum Vitamin D is usually seen with patients that are supplementing with too much vitamin D.

35.00
IU/L

ALT

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

1.24
mg/dL

CREATININE

Creatinine is produced primarily from the contraction of muscle and is removed by the kidneys. A disorder of the kidney and/or urinary tract will reduce the excretion of creatinine and thus raise blood serum levels. Creatinine is traditionally used with BUN to assess for impaired kidney function. Elevated levels can also indicate dysfunction in the prostate.

93.20
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.

1362.00
pg/ml

VITAMIN B12

Vitamin B12 is an essential nutrient for DNA synthesis and red blood cell maturation and is also necessary for myelin sheath formation and the maintenance of nerves in the body. Paradoxically, elevated serum B12 levels may be accompanied by signs of B12 deficiency and may indicate a functional deficiency marked by inadequate uptake at the tissue level.

3.70
pg/ml

T3 - FREE

T-3 is the most active thyroid hormone and is primarily produced from the conversion of thyroxine (T-4) in the peripheral tissue. Free T3 is the unbound form of T3 measured in the blood. Free T3 represents approximately 8 - 10% of circulating T3 in the blood. Free T-3 levels may be elevated with hyperthyroidism and is associated with iodine deficiency.

51.10
%

HEMATOCRIT - MALE

The hematocrit (HCT) measures the percentage of the volume of red blood cells in a known volume of centrifuged blood. It is an integral part of the Complete Blood Count (CBC) or Hematology panel. Elevated levels of hematocrit are associated with dehydration. An increased hematocrit is also associated with but by no means diagnostic of asthma or emphysema. Due to the lack of optimum oxygenation of the blood, the body will increase the red blood cell count to increase the number of cells that can be oxygenated. The hematocrit will go up accordingly.

9.50
%

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.

4.00
%

EOSINOPHILS - %

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

17.74
Ratio

BUN : CREATININE

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

42.00
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.

Below Optimal

22.23
%

% TESTOSTERONE BIOAVAILABLE - MALE

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

117.00
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. Decreased cholesterol levels are a strong indicator of gallbladder dysfunction, oxidative stress, inflammatory process, low-fat diets, and an increased heavy metal burden.

55.00
mg/dL

TRIGLYCERIDES

Serum triglycerides are composed of fatty acid molecules that enter the bloodstream either from the liver or from the diet. Serum Triglyceride levels may be decreased in liver dysfunction, a diet deficient in fat, and inflammatory processes.

56.00
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. There is no clinical significance for a decreased LDL level.

137.20
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.

1.35
Ratio

NEUTROPHIL : LYMPHOCYTE

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

71.20
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.

4.00
k/cumm

TOTAL WBCS

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

6.60
g/dL

PROTEIN - TOTAL

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

4.20
g/dL

ALBUMIN

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

239.00
μg/dL

DHEA-S - MALE

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

81.00
mL/min/1.73m²

EGFR

The eGFR is a calculated estimate of the kidney's Glomerular Filtration Rate. It uses 4 variables: age, race, creatinine levels and gender to estimate kidney function. Levels below 90 are an indication of a mild loss of kidney function. Levels below 60 indicate a moderate loss of kidney function and may require a visit to a renal specialist for further evaluation.

20.00
pg/ml

ESTRADIOL - MALE

Estradiol is a minor hormone in men. Estradiol is synthesized from testosterone and androstenedione in men and plays a role in male sex hormone physiology. Low levels of estradiol in men affect bone density and risk of fractures if too low.

47.00
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).

617.00
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.

9.00
µg/dL

CORTISOL - TOTAL/AM



The serum cortisol test is used to identify dysfunction in the adrenal gland. Decreased levels are associated with adrenal hypofunction, a dysfunction where the adrenal glands do not produce enough cortisol.

245.00
10E3/µL

PLATELETS



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

33.70
g/dL

MCHC



The Mean Corpuscular Hemoglobin Concentration (MCHC) measures the average concentration of hemoglobin in the red blood cells. It is a calculated value. Decreased levels are associated with a vitamin C need, vitamin B6 and iron deficiencies, and a heavy metal body burden.



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

Health Concerns

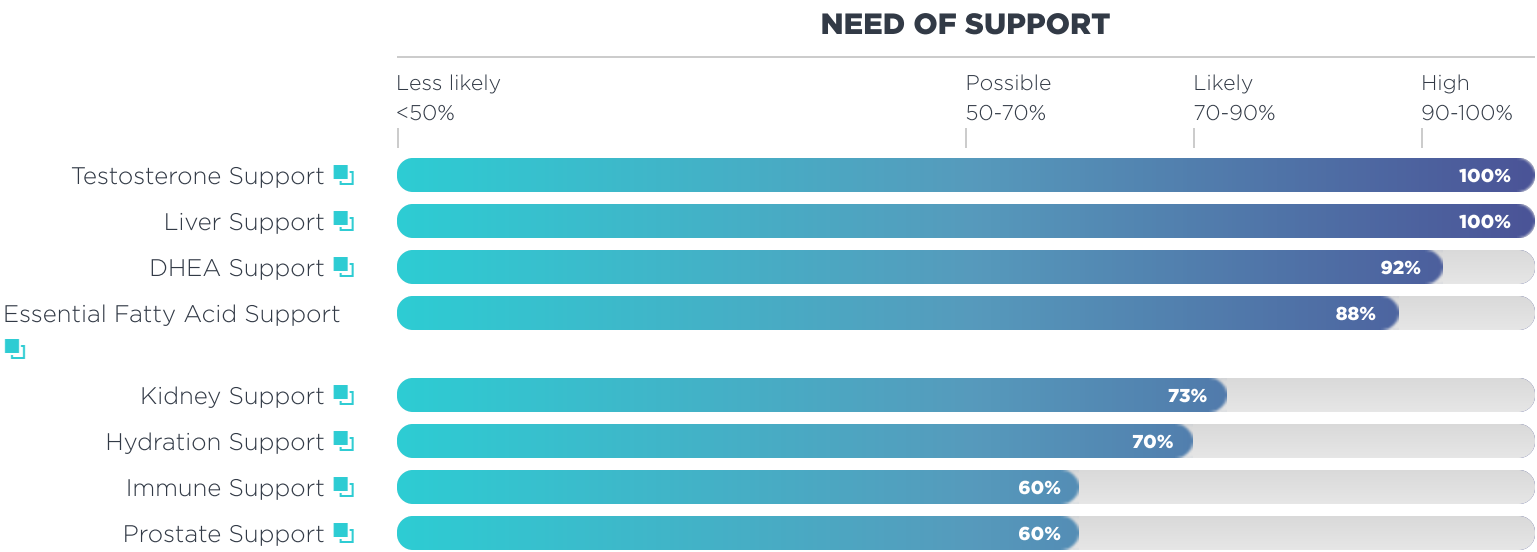
49 [Health Concerns](#)

52 [Recommended Further Testing](#)

Health Concerns

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

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



Health Concerns Details

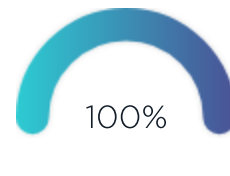
This section contains an explanation of the results presented in the Health Concerns report including all the biomarkers considered in the algorithmic analysis and the rationale behind the interpretation.

TESTOSTERONE SUPPORT

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

Rationale

Testosterone Total - Male ↓, Testosterone Free - Male ↓



LIVER SUPPORT

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

Rationale

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

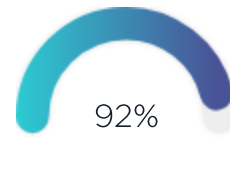


DHEA SUPPORT

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

Rationale

DHEA-S - Male ↓

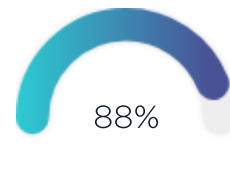


ESSENTIAL FATTY ACID SUPPORT

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

Rationale

Cholesterol - Total ↓, Triglycerides ↓

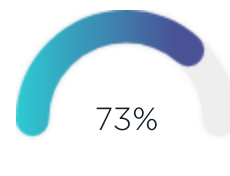


KIDNEY SUPPORT

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

Rationale

BUN ↑, Creatinine ↑, eGFR ↓

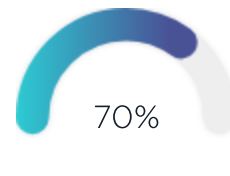


HYDRATION SUPPORT

The results of this blood test indicate that this patient may be dealing with dehydration, which is a very common problem. Insufficient water intake and/or excessive use of diuretics such as over the counter and prescription drugs, botanical medicines, caffeine etc. are the most common cause of dehydration.

Rationale

BUN ↑, RBC - Male ↑, Hemoglobin - Male ↑, Hematocrit - Male ↑



IMMUNE SUPPORT

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

Rationale

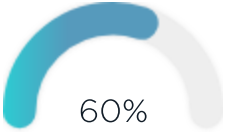
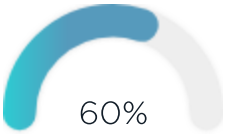
Total WBCs ↓, Albumin ↓

PROSTATE SUPPORT

The results of this blood test indicate a trend towards prostate dysfunction and/or Benign Prostatic Hypertrophy and a need for prostate support.

Rationale

Creatinine ↑, Monocytes - % ↑



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.

LOW TOTAL CHOLESTEROL

Low cholesterol in patients who historically had normal or high cholesterol is a strong diagnostic indicator for cancer, especially when the total lymphocytes are below 20% and the serum albumin is below 4.0 g/dL. Cholesterol serves as a precursor for hormone production, provides a protective coating for cell membranes, and plays a role in cell membrane capacitance. Cell to cell communication is also facilitated by cholesterol.

**Recommended Further Testing:

- AMAS Cancer Screening Test
- Advanced Oxidative Stress Profile
- Lipoprotein electrophoresis
- CBC w/ differential
- Comprehensive Fatty Acids Test
- Heavy Metals Testing

Rationale

Cholesterol - Total ↓

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

Testosterone Free - Male ↓, Testosterone Total - Male ↓, DHEA-S - 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 - % , Basophils - % , Monocytes - % 



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

Appendix

55 What To Look For

74 Disclaimer

What to Look For When Values Are Out of Range

Advanced professional only report

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

% TESTOSTERONE BIOAVAILABLE - MALE ↓

(22.23 %)

Decreased % Bioavailable T Associated with:

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

ALBUMIN ↓

(4.20 g/dL)

Hypochlorhydria

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

Liver dysfunction

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

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

Oxidative stress and excess Free Radical Activity

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

Vitamin C need

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

Pregnancy

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

ALT ↑
(35.00 IU/L)

Dysfunction located inside the liver

If the ALT is increased above the levels of the AST and GGT consider that the problem or area of involvement is **possibly** inside the liver.

Fatty liver (steatosis)

If the ALT is increased (>26) above the AST and GGT levels (>30), liver dysfunction due to fatty liver is probable. Consider it more likely if the LDH (>200) and ALP levels (>100) are also increased. In advanced steatosis, the ALT levels can be elevated 4 times the upper limit of normal (<140), accompanied by an elevation in AST. ALT is usually greater than the AST level.

Liver dysfunction

An increased ALT (>26) is associated with liver dysfunction. Dysfunction in the liver may cause an increase in ALT from hepatocytes.

Biliary tract obstruction

Suspect biliary tract obstruction when the ALT is elevated (>30) with increased GGT (>30), total bilirubin (>1.2 or >20.5 mmol/dL), alkaline phosphatase (>100) and/or LDH (>200)

Liver infection

When the ALT is elevated above the normal reference range (>40) or higher consider that there may be a liver infection. Hepatitis, CMV, EBV, Infectious mononucleosis, etc. should be ruled out when the ALT is greatly elevated.

Excessive muscle breakdown or turnover

ALT may be elevated when there is excessive muscle breakdown. Conditions such as weight-training and muscular injury can cause elevated levels of ALT to appear in the bloodstream.

Cirrhosis of the liver

An increase in ALT is associated with liver cirrhosis. Suspect liver cirrhosis if ALT (>45) is increased along with an increased AST (>40) and GGT (>70), with a decreased serum albumin (<4.0 or 40g/L), increased serum ALP (>200), increased serum bilirubin (>1.2 or >20.5 mmol/dL), decreased cholesterol (<160 or 4.14 mmol/L), increased globulin (>2.8 or 28 g/L), increased LDH (>200)

Liver cell damage

Liver damage due to active cellular destruction (i.e. chronic/acute hepatitis, active cirrhosis, infectious mononucleosis, hepatic necrosis, alcoholic hepatitis) will usually result in significantly elevated ALT values (30-50 times higher than normal).

AST ↑
(39.00 IU/L)

Dysfunction located outside the liver and biliary tree

If the AST is increased above the levels of the ALT and GGT consider that the problem or area of involvement is possible outside the liver and biliary tree (i.e. the heart, gall bladder, common bile duct, and pancreas)

A developing congestive heart problem

An increased AST level (>26) can be an important clue to a developing congestive heart problem. Congestive heart disease (CHF) is a very common cardiovascular disease so its helpful to use Functional Blood Chemistry Analysis to catch it before it fully develops. If the AST is increased higher than an accompanying ALT increase with a normal to increased GGT (>30), increased alkaline phosphatase (>100) and a decreased CO2 (<25) consider the possibility of a developing congestive heart problem. It is more likely if the patient also has an increased ESR, a normal to increased globulin and LDH, and an increased uric acid (>5.9 or 351 mmol/dL).

Cardiovascular insufficiency

Consider cardiovascular insufficiency if the AST is increased higher than an accompanying ALT increase with an increased CO2 and uric acid.

Liver dysfunction

An increased AST (>26) is associated with liver dysfunction. Dysfunction in the liver may cause an increase in AST from hepatocytes. You may also see a rise in ALT as well.

Acute Myocardial Infarct

With a suspected or an acute MI, the AST is increased 4-10 times above the reference range, peaking after 24 hours and normalizing after 3-4 days. Secondary rises in AST levels suggest a recurring MI or continued infarction.

Liver cell damage

Liver damage due to active cellular destruction (i.e. chronic/acute hepatitis, active cirrhosis, infectious mononucleosis, hepatic necrosis, alcoholic hepatitis) will usually result in AST values 10-100 times above reference range.

Excessive muscle breakdown or turnover

AST is present in high concentrations in tissues with high metabolic activity, such as skeletal muscle. Conditions or situations that cause cellular damage to skeletal muscle cells may cause an increased AST level (i.e. weight training injuries, trauma to skeletal muscle, polymyositis)

Infectious mononucleosis, Epstein Barr and Cytomegalovirus

AST levels are usually elevated way above the normal reference level about 5-14 days after the onset of illness. Alkaline phosphatase levels will also be elevated. LDH levels are usually elevated in about 95% of cases of. You may expect the following changes: decreased WBCs in the first week, increased WBCs by 2nd week of illness, increased GGT (about 7-21 days after onset of illness).

BASOPHILS - % ↑

(2.00 %)

Inflammation: non-specific

You may see an increased Basophils - Absolute count (>0.1) and/or an increased Basophils - % ($>1.0\%$) with any non-specific type of histamine, heparin, or serotonin-mediated inflammation or tissue destruction (bursitis, tendinitis, fibromyalgia, phlebitis, etc.) With severe inflammation and subsequent tissue damage expect to see an increase in Alpha 1 globulin. If the inflammation is located in the digestive tract, bone or liver expect to see increased Alkaline phosphatase levels (>100).

Intestinal parasites

Consider intestinal parasites if there are an increased Basophils - Absolute count (>0.1) and/or an increased Basophils - % ($>1\%$), an increased Eosinophils - % ($>3\%$), an increased Eosinophils - Absolute count (>0.3), an increased Monocytes - % ($>7\%$), and an increased Monocytes - Absolute (>0.58). Although not as indicative as an increased Eosinophils - Absolute count (>0.3) or an increased Eosinophils - % ($>3\%$), an increased Basophils - Absolute count (>0.1) and/or an increased Basophils - % ($>1\%$) is often seen with intestinal parasites, especially if inflammation is ruled-out as a cause of a basophil increase. If you suspect intestinal parasites you may want to rule it out with stool analysis. Eosinophils may be normal with an intestinal amoebic problem; however, the basophil count may be increased.

BUN ↑

(22.00 mg/dL)

Renal disease

Consider impaired renal function due to a potential renal disease with an increased BUN and serum creatinine, a BUN/Creatinine ratio between 10-20, a urine specific gravity between 1.010 - 1.016. You may also see an increased uric acid, serum phosphorous, LDH, and AST. Suspected renal disease should be referred to a qualified practitioner if present. However, an elevated BUN found in isolation of the pattern below is more indicative of renal insufficiency or other causes.

Renal insufficiency

An increased BUN level can be a sign of renal insufficiency, an often over-looked condition. Suspect renal insufficiency if there is an increased BUN level with a normal or increased serum Creatinine, a normal to increased Uric Acid, and an increased serum phosphorous. LDH and AST will usually be normal.

Dehydration

If BUN is increased suspect dehydration. Suspect a short-term (acute) dehydration if there is an increased HGB and/or HCT along with an increased RBC count. A relative increase in Sodium and Potassium can be noted as well. Suspect a long-term (chronic) dehydration if any of the above findings are accompanied by an increased Albumin, increased BUN and/or serum Protein.

Hypochlorhydria

An increased BUN level is associated with hypochlorhydria, a decreased production of hydrochloric acid in the stomach. Hypochlorhydria is possible with an increased globulin level and a normal or decreased Total Protein/Albumin. Hypochlorhydria is probable if globulin levels are increased along with an increased BUN, a decreased or normal Total Protein/Albumin and/or decreased serum Phosphorous. Other values that may be reflective of a developing or chronic hypochlorhydria include increased or decreased gastrin, an increased MCV and MCH, a decreased (or normal) calcium, a decreased iron, a decreased chloride, an increased anion gap, and a decreased alkaline phosphatase.

Diet- excessive protein intake or catabolism

Since the BUN level is dependent on dietary protein, an increased dietary protein or an increased catabolism of protein will lead to an increased BUN level.

Adrenal stress

BUN levels will be increased in states of protein catabolism, which is increased in adrenal hyperfunction. Excess cortisol levels will cause mobilization and an increased level of amino acids in the blood and liver by promoting protein catabolism. This will increase the levels of BUN.

Dysbiosis

An increased BUN level in the absence of other causes may be due to dysbiosis.

Edema

An increased BUN is associated with edema. Edema is rarely primary and is most often secondary to other metabolic disturbances, e.g. renal dysfunction, food/environmental sensitivities, cardiac muscle stress, or endocrine dysfunction. Investigate with appropriate testing (i.e. cardiac, hormone, and allergy testing). Serum sodium levels may also be decreased.

Anterior pituitary dysfunction

An increased BUN should be viewed as a sign of renal dysfunction. In cases of renal dysfunction the serum creatinine will most likely be elevated. If the serum creatinine is not elevated and the BUN is above normal L consider that the problem may be due to an anterior pituitary dysfunction and not renal dysfunction.

BUN : CREATININE ↑

(17.74 Ratio)

Renal disease

Consider impaired renal function due to a potential renal disease with an increased BUN and an increased serum creatinine. The BUN/Creatinine ratio will likely be between 10-20 and the Urine specific gravity will be between 1.010 - 1.016. You may also see increased Uric acid, increased serum phosphorous, increased LDH, and an increased AST. Suspected renal disease should be referred to a qualified practitioner if present. However, an elevated BUN found in isolation of the pattern below is more indicative of renal insufficiency or other causes.

CHOLESTEROL - TOTAL ↓

(117.00 mg/dL)

Oxidative Stress and Free Radical Activity

Suspect excess free radical activity and oxidative stress if the total cholesterol is suddenly below its historical level and is seen with a decreased lymphocyte count, a decreased albumin and platelet count, an increased total globulin and uric acid level, free radical pathology should be investigated. Oxidative stress can cause an increased destruction of red blood cells; in these situations you will see an elevated bilirubin level.

Heavy metal burden

patients with historically low 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.

Liver/gallbladder dysfunction

Gallbladder dysfunction limits the emulsification and digestion of fats, potentially leading to a decreased level of cholesterol. Liver dysfunction, such as late stage fatty liver, can also prevent the synthesis of endogenous cholesterol, triglycerides, and other lipids and lipoproteins. J. Mercola, DO, in his newsletter "Healthy News you can use", <http://www.mercola.com>, reported that, in his opinion, most low cholesterol levels are due to a dysfunctional gallbladder.

Diet- Fat Deficient

Low cholesterol along with a low triglyceride level is a sign of a fat deficient diet. This is a pattern that is commonly seen in vegetarians. Check red blood cell levels of essential fatty acids to determine essential fatty acid need. This may also be due a gallbladder dysfunction that causes a decrease in the emulsification and digestion of dietary fats and not necessarily a decrease in fats in the diet.

Thyroid hyperfunction

Hyperthyroidism is probable if there are low triglycerides with a low TSH and a high total T-3, free T3, and total T4. The low cholesterol levels are probably due to the excessive utilization of fatty acids by a metabolism that is excessively fast.

Inflammatory processes

If the cholesterol level is low or normal, triglycerides are decreased and HDL is increased, then some kind of inflammatory process in the body is possible. Consider further testing to rule out tissue inflammation or destruction (C-reactive protein, ANA, rheumatoid factor etc.). If tissue destruction is present, LDH, Alpha 1, or Alpha 2 globulin (seen with serum protein electrophoresis) will frequently be increased.

Adrenal stress

Low cholesterol levels may be due to the excessive metabolism often seen in patients with adrenal stress. They are burning up their lipids with their high levels of hormones. If you suspect this, order a salivary adrenal test to rule this out.

CORTISOL - TOTAL/AM ↓

(9.00 µg/dL)

Adrenal Fatigue and Adrenal Insufficiency

Adrenal fatigue and adrenal insufficiency cause a decrease in the glucocorticoid hormone cortisol. Additional findings include an increase in serum potassium along with a normal or decreased sodium and/or chloride. The sodium:potassium ratio will also be decreased. Other values that may be out of balance include decreased aldosterone level. Urinary chloride will be increased. Adrenal fatigue and adrenal insufficiency can be confirmed with salivary cortisol studies.

CREATININE ↑

(1.24 mg/dL)

Prostatic Dysfunction

An increased serum creatinine is associated with dysfunction of prostatic origin (Benign Prostatic Hypertrophy - BPH, prostatitis) or a chronic inflammatory/infectious process (chronic UTIs). Suspect BPH if there is an increased creatinine level along with a normal BUN and electrolytes, and an increased monocyte count and LDH isoenzyme #4, which has a prostatic origin.

Renal disease

Consider impaired renal function due to a potential renal disease with an serum creatinine, an increased BUN, a BUN/Creatinine ratio between 10-20, a urine specific gravity between 1.010 - 1.016, an increased uric acid, an increased serum phosphorous, an increased LDH, and an increased AST.

Renal insufficiency

A normal or increased serum Creatinine can be a sign of renal insufficiency, an often over-looked condition. Suspect renal insufficiency if there is an increased BUN level with a normal or increased serum Creatinine, a normal to increased Uric Acid , and an increased serum phosphorous. LDH and AST will usually be normal.

DHEA-S - MALE ↓

(239.00 µg/dL)

Adrenal Insufficiency

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

Hyperinsulinemia

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

Immune Insufficiency & Low sIgA

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

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

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

EGFR ↓

(81.00 mL/min/1.73m²)

Levels of eGFR below 60 are an indication of a loss of kidney function and may require a visit to a renal specialist for further evaluation.

Levels below 15 indicate that a treatment for kidney failure, such as dialysis or transplant will be needed.

EOSINOPHILS - % ↑

(4.00 %)

Intestinal parasites

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

Food and Environmental allergy/sensitivity

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

Asthma

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

ESTRADIOL - MALE ↓

(20.00 pg/ml)

Osteoporosis

Low levels of estradiol in men affect bone density and risk of fractures if too low. Research has shown that estradiol and not any other hormone increases the risk of vertebral fracture in older men.

FERRITIN ↑

(117.00 ng/mL)

Hemochromatosis/ hemosiderosis/iron overload

Hemochromatosis is a condition caused by excessive absorption of iron, resulting in an accumulation of surplus iron in the body's tissues, predominantly the liver. Laboratory tests may reveal various changes, such as an elevation in serum iron and ferritin levels, a reduction in Total Iron Binding Capacity (TIBC), and an increase in the percentage of transferrin saturation. The AST level may also be elevated.

Excess consumption of iron

Excess consumption of iron can come from a number of different sources: Elevated levels of iron in the drinking water, Iron cookware, especially when used to cook acidic foods e.g. tomatoes, Consumption of iron containing supplements. All of the above are often the reason for an increased serum iron and an increased ferritin.

Cardiovascular Risk

Low ferritin is the best measure of iron deficiency but most people do not know that elevated ferritin is an important maker of cardiovascular health. High levels are found in inflammation, ischemic heart disease, iron overload (hemosiderosis), and hemochromatosis, the genetic disease that causes iron to be deposited into the tissue. When the transferrin saturation rate, transferrin iron binding capacity, and serum iron are all normal, then a high serum ferritin indicates inflammation, not hemochromatosis.

Inflammation/ liver dysfunction/ oxidative stress

Serum ferritin is one of a group of proteins that can become increased in response to inflammation, infection, or trauma. Elevations can last for weeks. Elevated ferritin along with normal serum iron is suggestive of inflammation, liver dysfunction, or oxidative stress.

HDL CHOLESTEROL ↓

(47.00 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 and LDL 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

Metabolic Syndrome /hyperinsulinemia

If HDL levels are decreased, triglycerides are increased above the total cholesterol level with increased LDL cholesterol and increased fasting blood glucose, 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, and LDL, triglyceride and total cholesterol levels 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 elevated, triglycerides are increased, and the ALT is decreased. 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.

HEMATOCRIT - MALE ↑

(51.10 %)

Asthma and emphysema

An increased HCT (>44 or 0.44 in women and >48 or 0.48 in men) is by no means a definitive diagnostic marker for asthma or emphysema. Due to the lack of optimum oxygenation of the blood, the body will increase the red blood cell count to increase the number of cells that can be oxygenated. The hematocrit will go up accordingly.

Polycythemia (relative or primary)

Relative: a polycythemia that is relative to the degree of hemo-concentration, i.e. **dehydration**. **Primary:** Polycythemia vera- a myeloproliferative disease marked by an increase in all blood cells. The hematocrit will go up according to the increase in cell volume.

Dehydration

If the hematocrit is increased 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 (>5.0 or 50 g/L), increased BUN (>16 or 5.71 mmol/L), and/or serum Protein (> 7.4 or 74 g/L).

HEMOGLOBIN - MALE ↑

(17.20 g/dl)

Asthma and emphysema

An increased hemoglobin (>14.5 or 145 in women or 15 or 150 in men) is by no means a definitive diagnostic marker for asthma or emphysema. Due to the lack of optimum oxygenation of the blood, the body will increase the red blood cell count to increase the number of cells that can be oxygenated. The hemoglobin will go up accordingly.

Polycythemia (relative or primary)

Relative: a polycythemia that is relative to the degree of hemoconcentration, i.e. **dehydration**.

Primary: Polycythemia vera- a myeloproliferative disease marked by an increase in all blood cells. The hemoglobin will go up according to the increase in cell volume.

Dehydration

If the hemoglobin is increased suspect dehydration. 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 (>5.0 or 50 g/L), increased BUN (>16 or 5.71 mmol/L), and/or serum Protein (> 7.4 or 74 g/L).

LDL CHOLESTEROL ↓

(56.00 mg/dL)

MCHC ↓

(33.70 g/dL)

Vitamin C need

A decreased MCHC level is associated with vitamin C need. Albumin will frequently be decreased along a decreased HCT, HGB, MCH, serum iron. There will also be an increased MCV, alkaline phosphatase, fibrinogen.

Anemia- B6 deficiency

B6 anemia is not very common but possible given the deficiencies of B6 and other B complex vitamins. If there is a decreased MCV, MCH, MCHC, HGB, and/or HCT and an increased or normal serum iron and/or ferritin, B6 anemia is possible. If there is a decreased MCV, MCH, with a decreased SGOT/AST, SGPT/ALT or GGTP , B6 anemia is probable.

Anemia- Iron deficiency

This is the most prevalent anemia worldwide. The major causes are: Dietary inadequacies, Malabsorption, Increased iron loss, Increased iron requirements. If there is a decreased MCH, MCV, MCHC, and HCT and/or HGB, and a decreased serum iron, ferritin, % transferrin saturation, and increased RDW, then iron anemia is probable. If TIBC is increased, microscopic bleeding is possible, and should be ruled out with reticulocyte count, urinalysis, and/or stool analysis. Iron deficiency anemia may be secondary to hypochlorhydria if serum phosphorous is decreased and serum globulin is increased or decreased.

Heavy metal body burden (e.g. lead, aluminum, cadmium, and other toxic metals)

One of the significant effects of toxic metals is the impact they have on red blood cells, especially hemoglobin. If there is a decreased MCH and MCHC with a decreased uric acid, suspect a heavy metal body burden. Confirm with a hair analysis or toxic element testing via blood or urine. The serum levels of the metals may also be increased, but in sub-acute conditions the serum levels may be normal. The hair and urinary/blood tests will frequently reflect the increase before it is seen outside the reference range in the serum.

MCV ↑

(93.20 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).

MONOCYTES - % ↑

(9.50 %)

Recovery phase of acute infection

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

Liver dysfunction

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

Intestinal parasites

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

Males

Urinary Tract Congestion: Benign Prostatic Hypertrophy (BPH)

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

MPV ↑

(9.60 fL)

An elevated MPV is seen in:

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

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

NEUTROPHIL : LYMPHOCYTE ↓

(1.35 Ratio)

Viral Infection

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

PLATELETS ↓

(245.00 $10E3/\mu L$)

Infections

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

Idiopathic Thrombocytopenia

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

Heavy metals

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

Oxidative Stress and Free Radical Activity

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

Purpura and petechiae

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

PROTEIN - TOTAL ↓

(6.60 g/dL)

Hypochlorhydria

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

Digestive dysfunction/ inflammation

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

Liver dysfunction

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

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

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

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

RBC - MALE ↑

(5.48 m/cumm)

Relative increases in RBC count

Whenever there is a decrease in blood volume, you will see a relative increase in the RBC count (>4.5 in women and >4.9 in men) usually with an increased HCT (>44 or 0.44 in women and >48 or 0.48 in men), and HGB (>14.5 or 145 in women or 15 or 150 in men). Common causes of a relative increase in RBC count include: Dehydration (decreased fluid intake, vomiting, diarrhea), Stress, Tobacco use, Overuse of diuretics

Dehydration

If the RBC count is increased suspect dehydration. 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 (>5.0 or 50 g/L), increased BUN (>16 or 5.71 mmol/L), and/or serum Protein (7.4 or 74 g/L).

Respiratory distress

In severe cases of asthma and emphysema you can expect an increased red cell count with decreased 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) . The body responds to an inability to fully oxygenate the blood with an increase in red blood cells.

Vitamin C need

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

Polycythemia vera

A myeloproliferative disease that causes an increase in all blood cell lines. This disease will cause an increased HCT (>44 or 0.44 in women and >48 or 0.48 in men), and HGB (>14.5 or 145 in women or 15 or 150 in men), total bilirubin (>1.2 or 20.5 mmol/dL), uric acid (>5.9 or > 351 mmol/dL), basophils (>1), and ALP (>100). Further testing with blood coagulation studies is needed.

SEX HORMONE BINDING GLOBULIN - MALE ↑

(42.00 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.

T3 - FREE ↑

(3.70 pg/ml)

Hyperthyroidism

Although less common than hypothyroidism, the following pattern may help elucidate a developing or existent hyperthyroid state. Hyperthyroidism is possible if: TSH is low (<1.3), The likelihood increases when there is also an increased Total T3 (>230 ng/dl or 3.53 nmol/L), Increased Free T3 (>3.5 pg/ml or 5.38 pmol/L), T3 uptake (>0.37), Increased FTI (>4.6) and/or Increased T4 (>11.9 µg/dl or 153 nmol/L). Consider running thyroid antibody studies to rule out Hashimoto's thyroiditis and Grave's disease. Rule out food allergy/sensitivities, environmental sensitivities, recent immunizations/inoculations, viral infections, and other auto-immune problems in any cases of suspected hyperthyroidism.

Iodine deficiency

Although thought of as rare, iodine deficiency is actually quite common as there are many reasons for its deficiency. With iodine deficiency, the total T4 will often be decreased (<6.0 µg/dl or 77 nmol/L), Decreased free T4 (<1.0 ng/dl or 12.9 nmol/L), The total T3 is often increased (>168 ng/dl or 2.6 nmol/L) sometimes accompanied by an elevated free T3 (>3.5 pg/ml or 5.38 pmol/L) and a normal or mildly elevated TSH (>2.0).

TESTOSTERONE BIOAVAILABLE - MALE ↓

(137.20 ng/dl)

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

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

TESTOSTERONE FREE - MALE ↓

(71.20 pg/ml)

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

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

TESTOSTERONE TOTAL - MALE ↓

(617.00 ng/dl)

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

- Metabolic Syndrome

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

TOTAL WBCS ↓

(4.00 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 Erythematosus (SLE)

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

Decreased production

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

Raw food diet

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

TRIGLYCERIDES ↓

(55.00 mg/dL)

Liver/biliary dysfunction

Biliary congestion/stasis can impact on the emulsification and digestion of fats, which may lead to a decreased level of triglycerides <70 or <0.79 mmol/l. Liver dysfunction, such as fatty liver, can also prevent the synthesis of endogenous triglycerides and other lipids and lipoproteins. Biliary congestion/stasis can often be caused by a mild obstruction in the extra-hepatic biliary duct. Here are the findings on a blood test for biliary congestion/stasis: GGTP levels will frequently be increased (>30) but not necessarily, Bilirubin levels will also be elevated (>1.2 or 20.5 mmol/dL), Increased alkaline phosphatase (>100), Increased total cholesterol (>180 or 4.66 mmol/L), SGOT/AST and SGPT/ALT may be normal or increased (>30). Also, many cases of biliary congestion/stasis will show normal lab values.

Diet- Nutrient deficient, insufficient fat intake, vegetarian diet

Dietary intake of healthy fats maybe low, a pattern that is commonly seen in vegetarians.

Thyroid hyperfunction

Hyperthyroidism is probable if there are low triglycerides (<70 or <0.79 mmol/L) with a low TSH (<1.3) and a high total T-3 (>168 or 2.6 nmol/L), elevated free T3 (>3.25 or 5.0) and an elevated total T4 (>11.9 or 154 nmol/L). The low triglyceride levels are probably due to the excessive utilization of fatty acids by a metabolism that is excessively fast.

Autoimmune processes

If triglycerides are decreased (<40 or 0.45 mmol/L) with low or normal cholesterol ($160 - 180$ or $4.14 - 4.66$ mmol/L) and an increased HDL (>70 or 1.81 mmol/L), then some kind of autoimmune process in the body is possible. The problem may be inflammatory or destructive in nature. Consider further testing to rule-out tissue inflammation or destruction (C-reactive protein, ANA, rheumatoid factor etc.). If tissue destruction is present, LDH, Alpha 1 or Alpha 2 globulin (seen with serum protein electrophoresis) will frequently be increased. This may also be a sign of endocrine dysfunction due to endocrine hypo or hyper function. Consider further endocrine testing to locate cause of the disturbance.

VITAMIN B12

(1362.00 pg/ml)

Functional B12 Deficiency Marked by Inadequate Uptake at the Tissue Level

Paradoxically, elevated serum B12 levels may be accompanied by signs of B12 deficiency and may indicate a functional deficiency marked by inadequate uptake at the tissue level.

Other Conditions That May Need to be Followed-Up

Elevated B12 levels are also associated with conditions such as chronic myeloproliferative neoplasm, diabetes, heart failure, obesity, AIDS, or severe liver disease, all of which may have an increased Vitamin B12 level.

In a symptomatic patient

If the patient is symptomatic and the serum B12 levels are elevated ask whether or not they have received a B12 shot from another clinician within that last 12 months or has received Total Parenteral Nutrition (TPN) or a Multi-Vitamin Infusion (MVI). You will also want to ask if they are self-treating with high-dose B12. If neither of these is true then consider a therapeutic trial of B12 and monitor.

VITAMIN D (25-OH)

(115.00 ng/ml)

Excess Vitamin D

An increased serum Vitamin D is usually seen with patients that are supplementing with too much vitamin D. Remember that Vitamin D is a fat soluble nutrient and serum levels will start to rise above optimal when fat stores of vitamin D are full.

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