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# Blood Chemistry Analysis

# Functional Health Report



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## Patient Report

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**Prepared for** Jane Doe  
58 year old female born Oct 24, 1960  
56 years old at the time this lab test was taken.

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**Requested by** Ms Tzabia Siegel  
The Food Coach

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**Test date** Jan 19, 2017

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# What's Inside?

An introduction to functional blood chemistry analysis and your 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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- 1 What's Inside?
- 3 Functional BCA
- 4 Patient Report

The top areas that need the most attention.

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- 10 Macronutrient Status
- 12 Nutrient Deficiencies

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An introduction to functional blood chemistry analysis and your report.

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## Introduction

- 1 What's Inside?
- 3 Functional BCA
- 4 Patient Report



# Functional Blood Chemistry Analysis

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

## WHY BLOOD TESTING?

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

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

## "NORMAL" IS NOT OPTIMAL

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

The issue is not that the blood test is a poor diagnostic tool, far from it. The issue is that the ranges used on a traditional lab test are based on statistics and not on whether a certain value represents good health or optimal physiological function. The problem is that "normal" reference ranges usually represent "average" populations rather 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 that are based on optimal physiology and not the "normal" population. This results in a tighter "Functional Physiological Range", which allows us to evaluate the area within the "Normal" range that indicates that something is not quite right in the physiological systems associated with this biomarker. This gives us the ability to detect changes in your physiological "function". We can identify the factors that obstruct you from achieving optimal physiological, biochemical, and metabolic functioning in your body.

Another thing that separates 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 your 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 your body.

## SUMMARY

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

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# Patient Report

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

## MS TZABIA SIEGEL

Other Practitioner

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## THE FUNCTIONAL HEALTH REPORT

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

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

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## ASSESSMENT

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

The Body Systems and Accessory reports show the level of dysfunction that exists in the various physiological and supporting accessory systems in your body.

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

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

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## ANALYSIS

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

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

The Blood Test Results Comparative Report compares results of the latest and previous 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.

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## HEALTH IMPROVEMENT PLAN

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



An in-depth functional system and nutrient evaluation.

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## Assessment

- 6 Functional Body Systems
- 8 Accessory Systems
- 10 Macronutrient Status
- 12 Nutrient Deficiencies

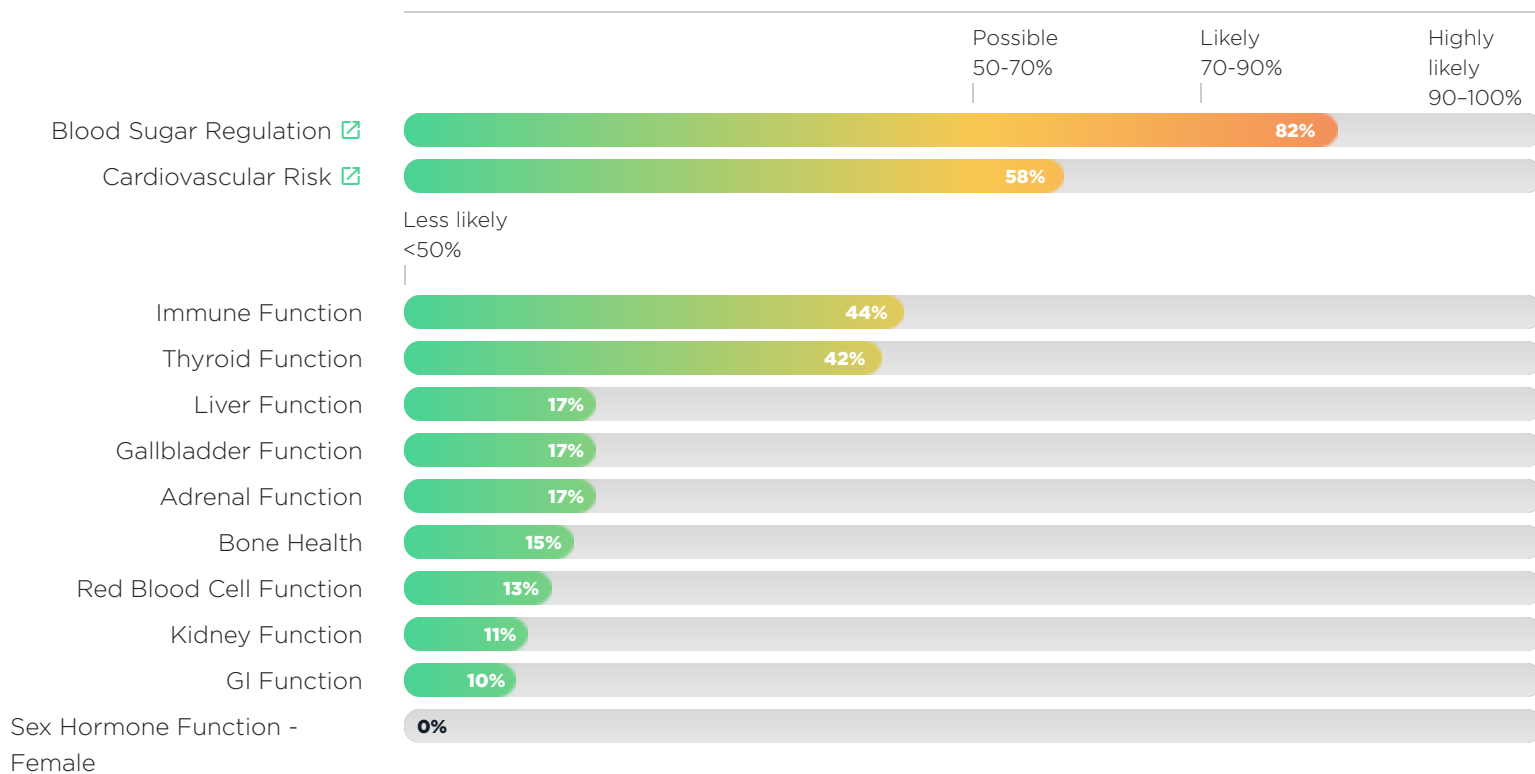
# Functional Body Systems

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

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

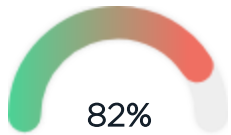
Each Body System that has a probability of dysfunction above 50% is included in the section that follows so you can read a highly detailed description and individual explanation of the results shown in this report.

## 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.



82%

Dysfunction Likely.  
Improvement required

## BLOOD SUGAR REGULATION [🔗](#)

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

### Rationale

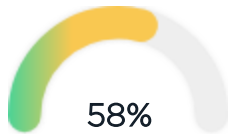
Glucose [↑](#), Cholesterol - Total [↑](#), LDL Cholesterol [↑](#)

### Biomarkers considered

Glucose, Hemoglobin A1C, Cholesterol - Total, Triglycerides, LDL Cholesterol, HDL Cholesterol

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

LDH, Insulin - Fasting, DHEA-S - Female, C-Peptide, Fructosamine, Leptin - Female



58%

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

## CARDIOVASCULAR RISK [🔗](#)

The Cardiovascular Risk score looks at 15 biomarkers on a blood test to assess your risk of cardiovascular dysfunction. A high Cardiovascular Risk score indicates that you may be at an increased risk of developing cardiovascular disease. The Cardiovascular Risk score will be used along with information from an examination of your diet, lifestyle, exercise, body mass index and family history to give us a more complete picture of what is going on.

### Rationale

Glucose [↑](#), Cholesterol - Total [↑](#), Triglycerides [↑](#), LDL Cholesterol [↑](#), Hs CRP - Female [↑](#)

### Biomarkers considered

Glucose, Cholesterol - Total, Triglycerides, LDL Cholesterol, HDL Cholesterol, Ferritin, Hs CRP - Female, Hemoglobin A1C

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

AST (SGOT), LDH, Fibrinogen, Homocysteine, Testosterone Free - Female, Insulin - Fasting, Vitamin D (25-OH)



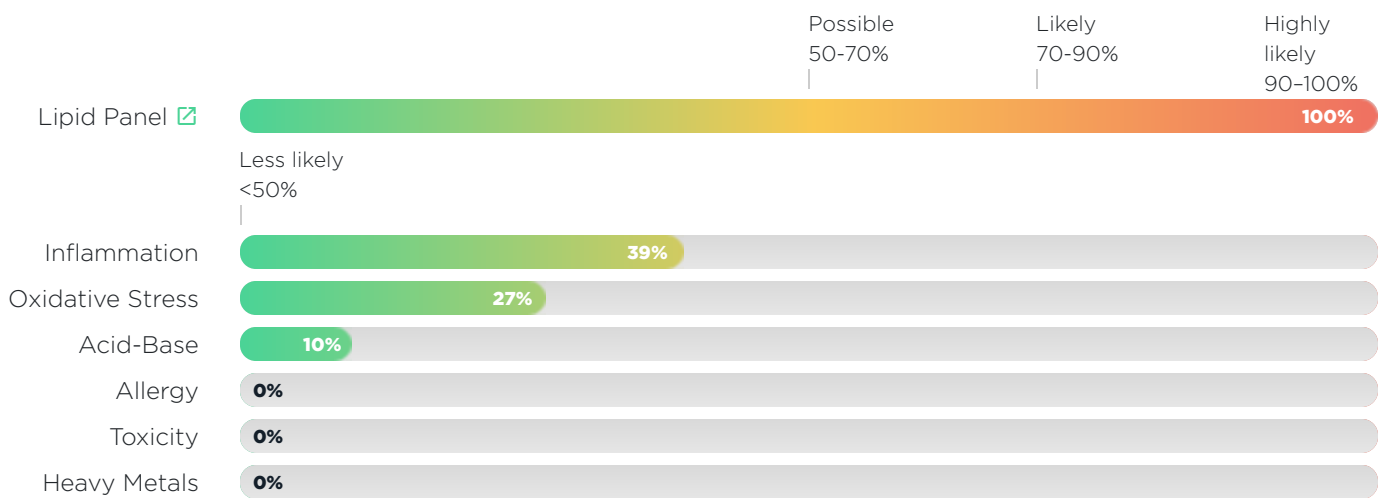
# Accessory Systems

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

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

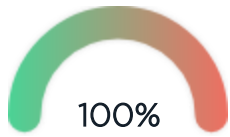
Each Accessory System that has a probability of dysfunction above 50% is included in the section that follows so you can read a highly detailed description and individual explanation of the results shown in this report.

## PROBABILITY OF DYSFUNCTION



# 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.



100%

Dysfunction Highly Likely.  
Much improvement  
required.

## LIPID PANEL [🔗](#)

The Lipid Panel score gives us an indication of the levels of cholesterol and fat in your blood. An increased Lipid Panel score indicates that you have higher than optimal levels of cholesterol and fat in your blood (a condition called hyperlipidemia). Hyperlipidemia is associated with an increased risk of cardiovascular disease and may be genetic or be due to dietary factors, hormonal imbalances, blood sugar dysregulation and/or other metabolic imbalances.

### Rationale

Cholesterol - Total [↑](#),  
Triglycerides [↑](#), LDL  
Cholesterol [↑](#)

### Biomarkers considered

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

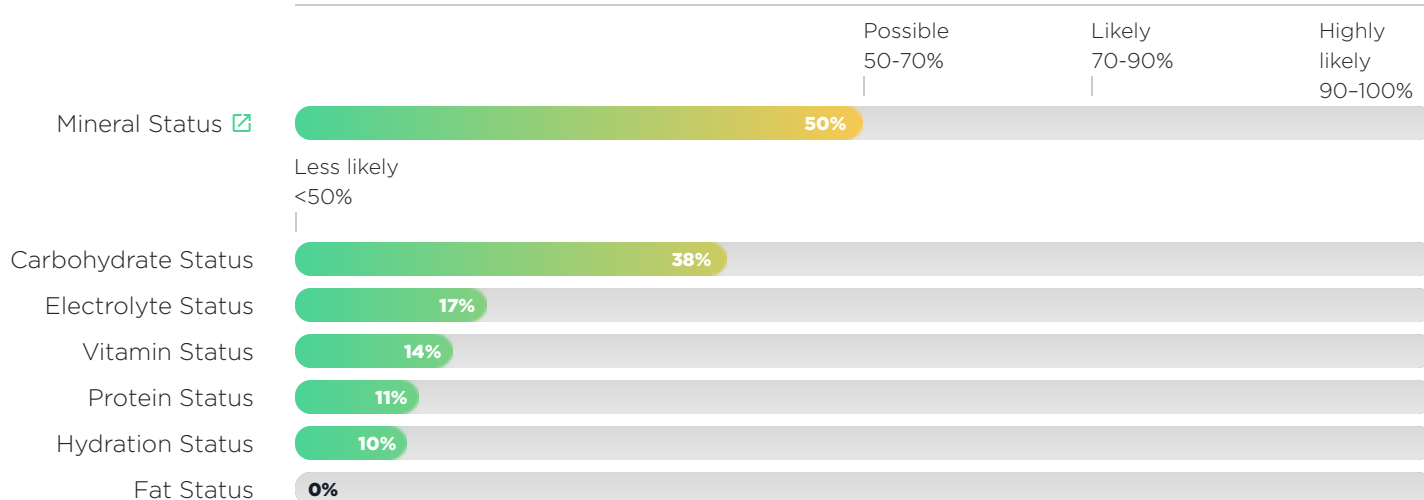
# Macronutrient Status

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

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

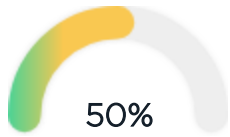
Each Macronutrient that has a probability of dysfunction above 50% is included in the section that follows so you can read a highly detailed description and individual explanation of the results shown in this report.

## PROBABILITY OF DYSFUNCTION



# Macronutrient Status Details

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



50%

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

## MINERAL STATUS [📄](#)

The Mineral Status score gives us a general indication of the balance of certain minerals in your body based on the results of this blood test. Mineral levels in the body are closely regulated and deficiency in one or more minerals may be due to a number of factors such as the amount in your diet, the ability to digest and break down individual minerals from the food or supplements you consume, and the ability of those minerals to be absorbed, transported and ultimately taken up by the cells themselves.

### Rationale

Calcium ↓, Alk Phos ↓, Free T3 ↓

### Biomarkers considered

Potassium, Calcium, Alk Phos, GGT, Ferritin, Free T3, MCV, Magnesium

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

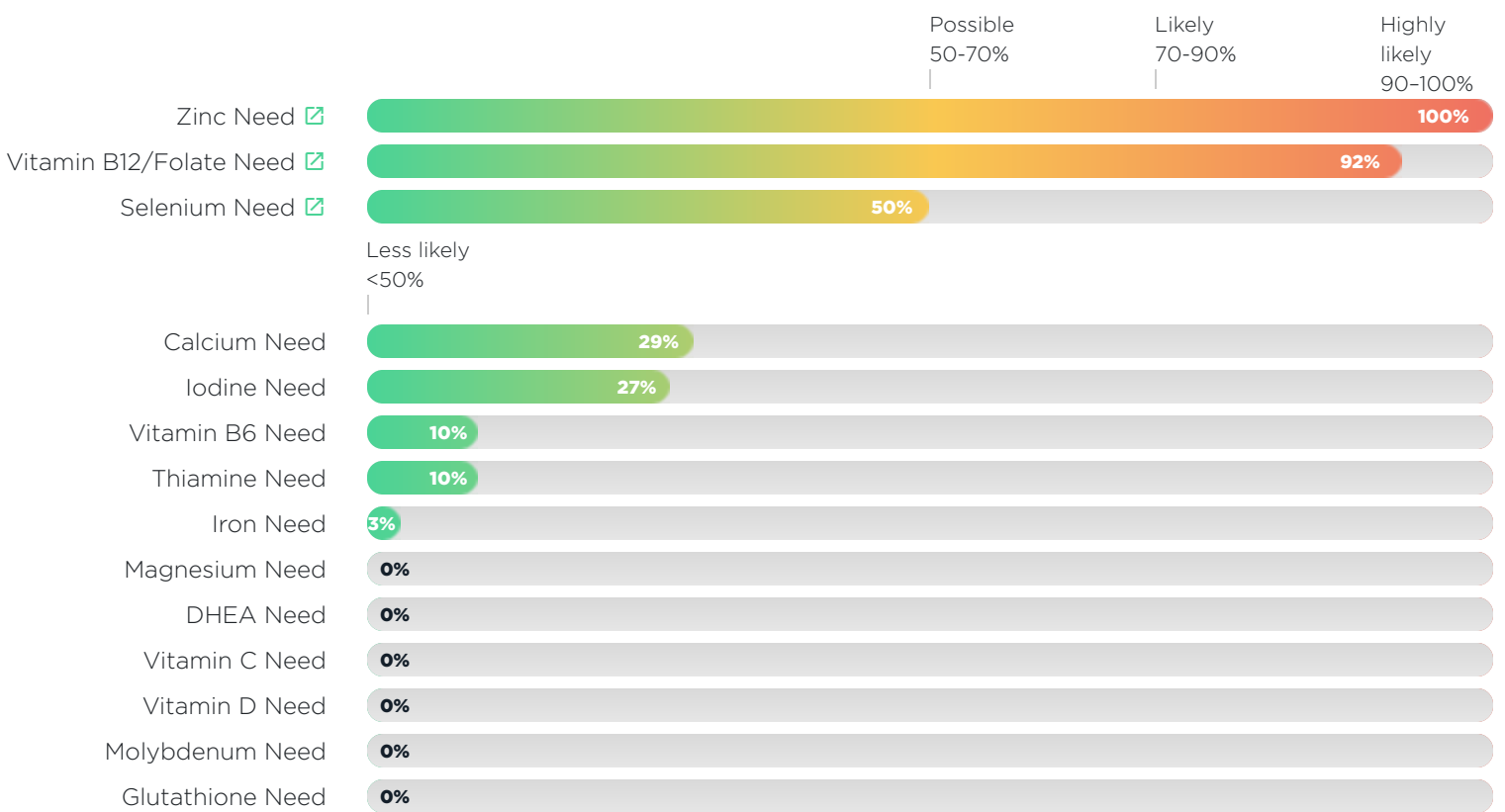
Uric Acid - Female, Phosphorus, Iron - Serum, TIBC, % Transferrin saturation, Total T3

# Individual Nutrient Deficiencies

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

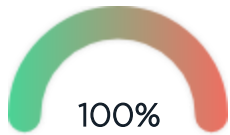
Each individual Nutrient Deficiency that has a probability of dysfunction above 50% is included in the section that follows so you can read a highly detailed description and individual explanation of the results shown in this report.

## PROBABILITY OF DYSFUNCTION



# Individual Nutrient Deficiencies Details

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



100%

## ZINC NEED [🔗](#)

The results of your blood test indicate that your Zinc levels might be lower than optimal.

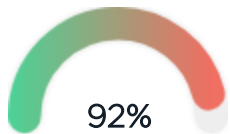
### Rationale

Alk Phos ↓

### Biomarkers considered

Alk Phos

Dysfunction Highly Likely.  
Much improvement  
required.



92%

## VITAMIN B12/FOLATE NEED [🔗](#)

The results of your blood test indicate that your Vitamin B12 and Folate levels might be lower than optimal.

### Rationale

RDW ↑, Vitamin B12 ↓

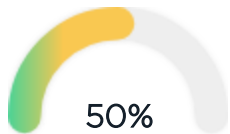
### Biomarkers considered

MCV, Total WBCs, RBC - Female, Hemoglobin - Female, Hematocrit - Female, MCH, MCHC, RDW, Neutrophils, Vitamin B12

Dysfunction Highly Likely.  
Much improvement  
required.

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

LDH, Homocysteine, Uric Acid - Female, Albumin, Folate



50%

## SELENIUM NEED [🔗](#)

The results of your blood test indicate that your selenium levels might be lower than optimal.

### Rationale

Free T3 ↓

### Biomarkers considered

Free T3

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

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

Total T3, T3 Uptake



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

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## Analytics

- 15 Blood Test Results
- 22 Blood Test Results Comp.
- 24 Blood Test Score
- 26 Blood Test History
- 29 Out of Optimal Range

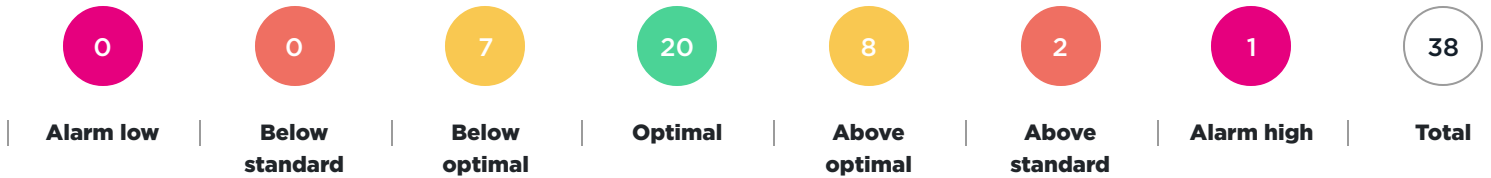
<b>Blood Test Results</b>	Blood Test Results Comp.	Blood Test Score	Blood Test History	Out of Optimal Range
Blood Glucose	Renal	Electrolytes	Minerals	Liver and GB
Iron Markers	Lipids	Thyroid	Inflammation	Vitamins
CBC/Hematology	White Blood Cells			

# Blood Test Results

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

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

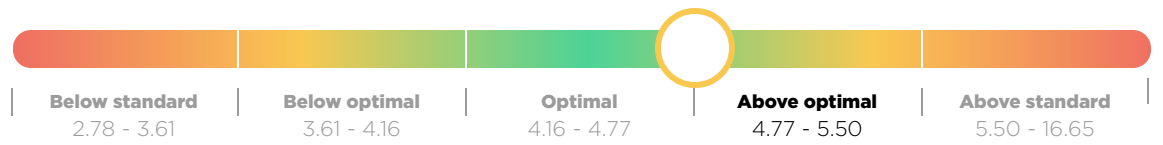
## Total number of biomarkers by optimal range



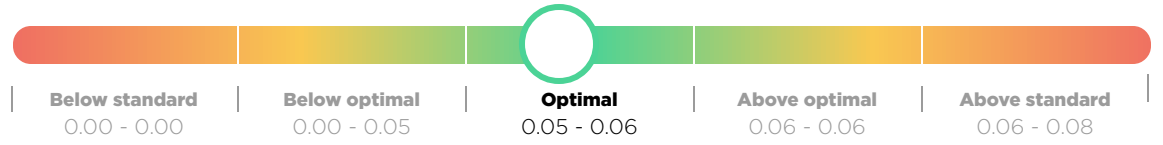


## BLOOD GLUCOSE

Glucose   
4.80 mmol/L

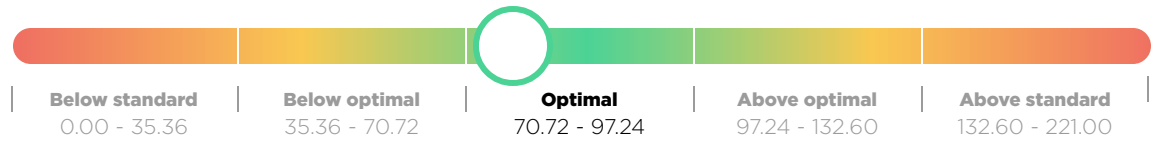


Hemoglobin A1C  
0.05 Proportion of 1.0

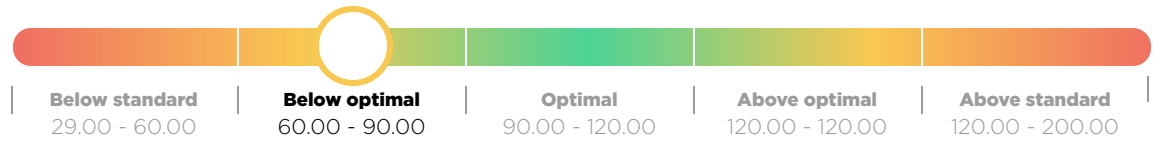


## RENAL

Creatinine  
77.00  $\mu$ mol/L

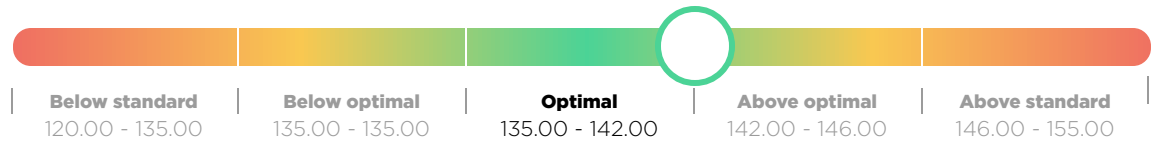


eGFR Non-Afr. American   
75.00 mL/min/1.73m<sup>2</sup>

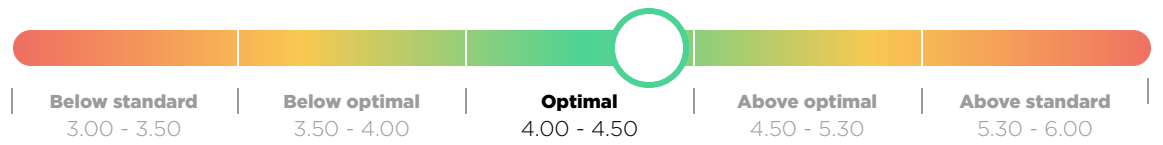


## ELECTROLYTES

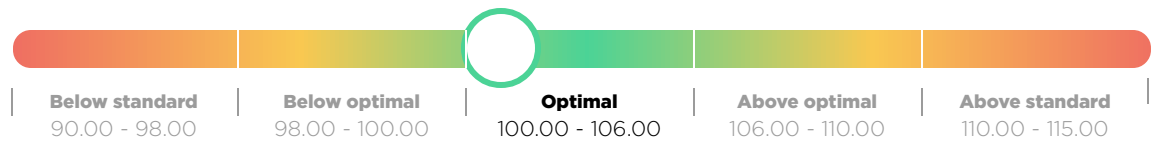
Sodium  
142.00 mmol/L



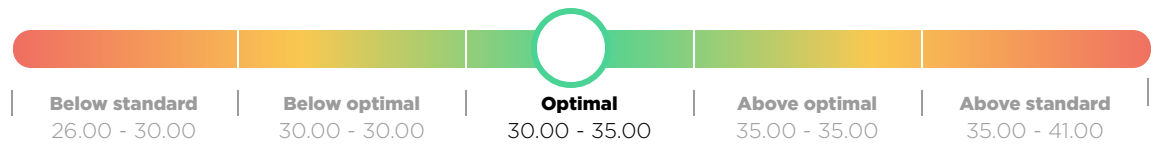
Potassium  
4.40 mmol/L




Chloride  
101.00 mmol/L

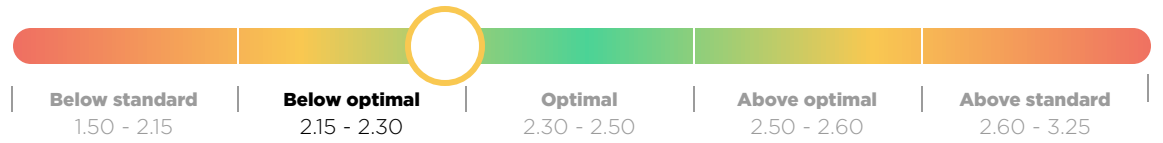



Sodium/Potassium Ratio  
32.27 ratio

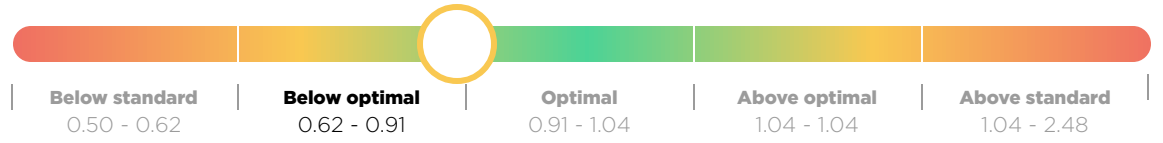


## MINERALS


Calcium   
2.29 mmol/L

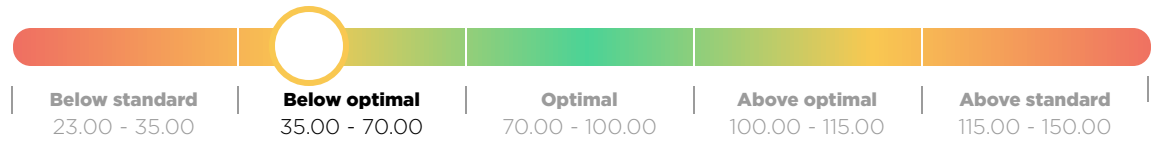


Magnesium   
0.91 mmol/L

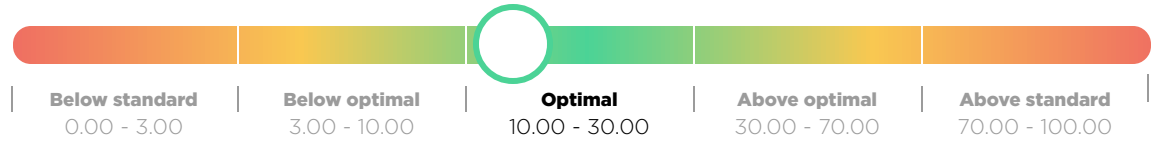


## LIVER AND GB


Alk Phos   
47.00 IU/L

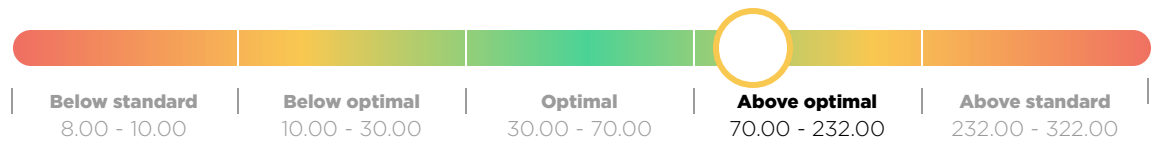


GGT  
14.00 IU/L



## IRON MARKERS

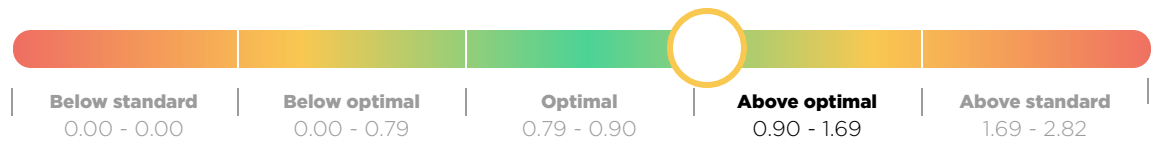
Ferritin   
116.00 µg/L



## LIPIDS

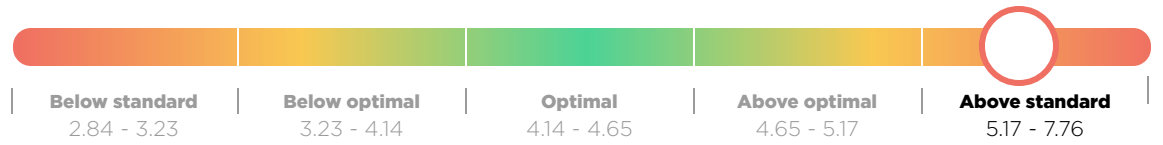
Triglycerides 

0.97 mmol/L



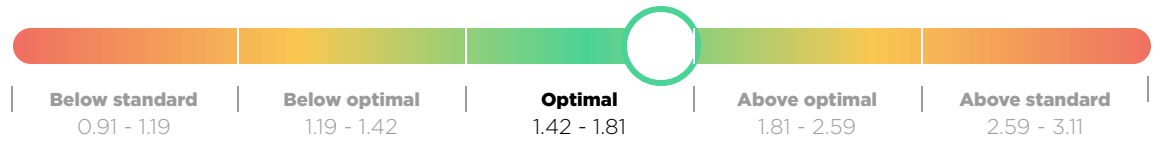
Cholesterol - Total 

6.80 mmol/L



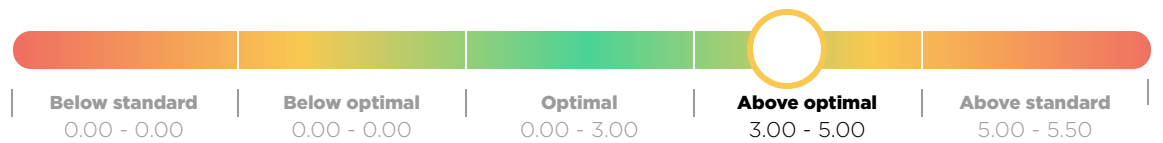
HDL Cholesterol

1.77 mmol/L



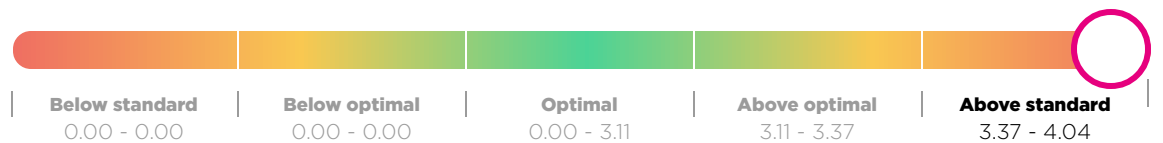
Cholesterol/HDL Ratio 

3.80 Ratio



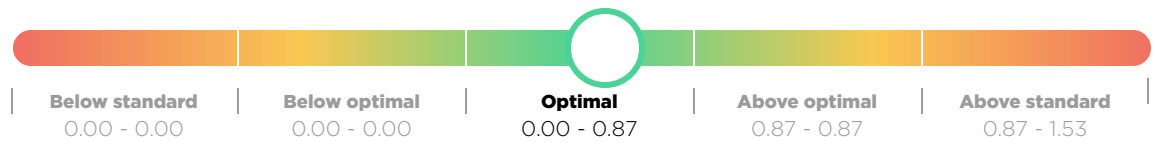
LDL Cholesterol 

4.59 mmol/L 



Triglyceride/HDL Ratio

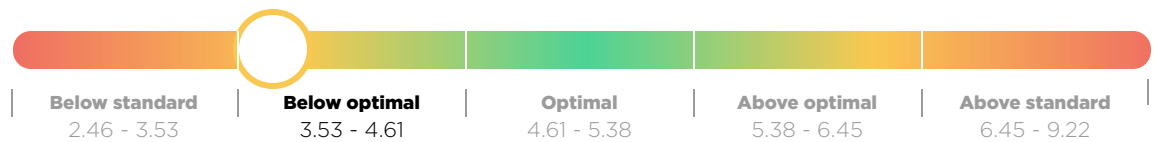
0.54 ratio



## THYROID

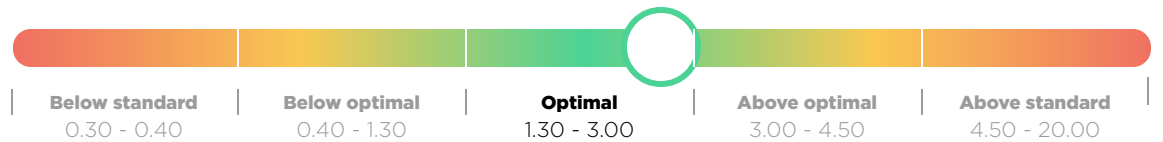
Free T3 

3.70 pmol/L



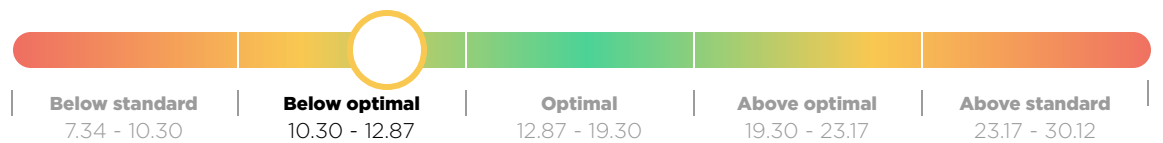
TSH

2.80 mIU/L



Free T4 

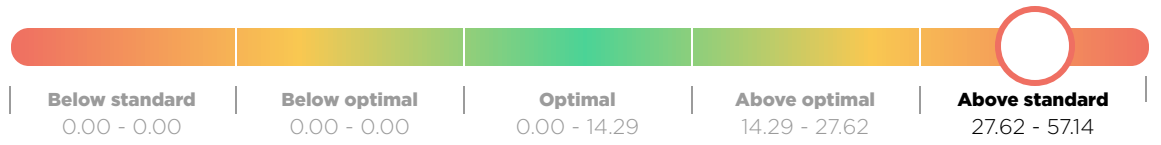
12.00 pmol/L



## INFLAMMATION

Hs CRP - Female [📄](#)

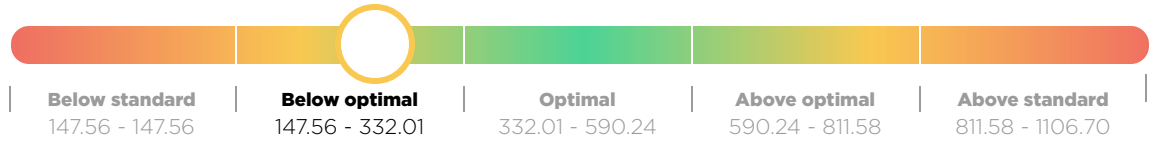
43.14 nmol/L



## VITAMINS

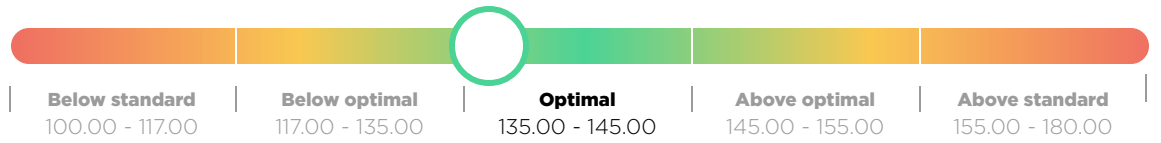
Vitamin B12 [📄](#)

260.00 pmol/L

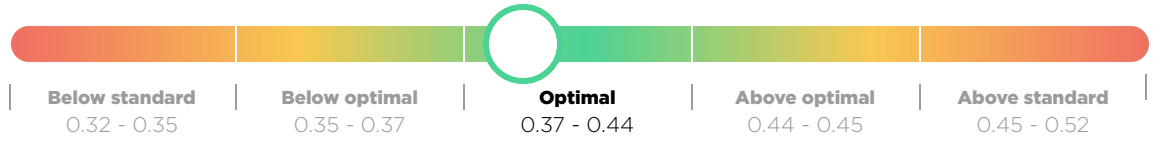


# CBC/HEMATOLOGY

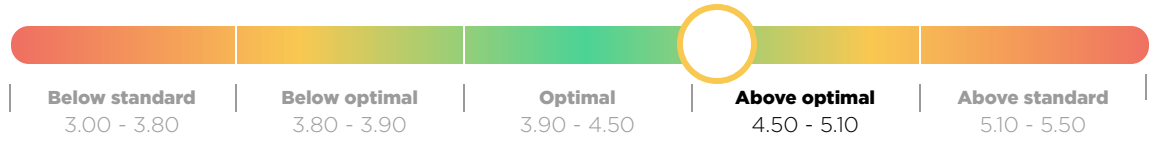
Hemoglobin - Female  
136.00 g/L



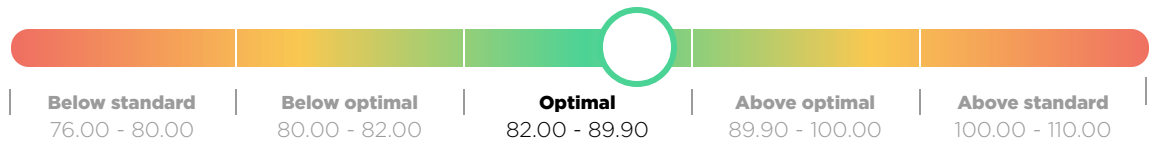
Hematocrit - Female  
0.39 Prop. of 1.0



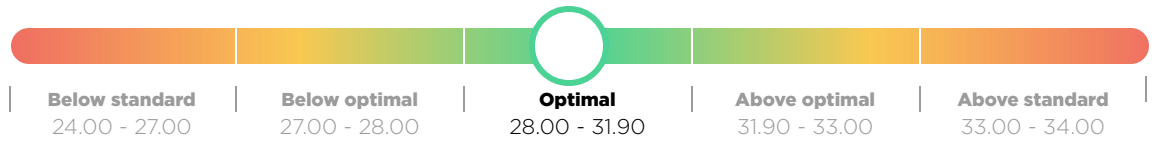
RBC - Female   
4.56 10E12/L



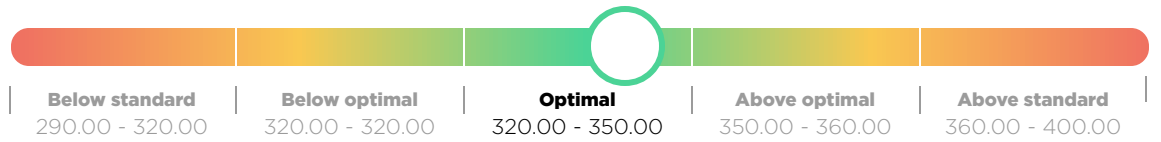
MCV  
88.00 fL



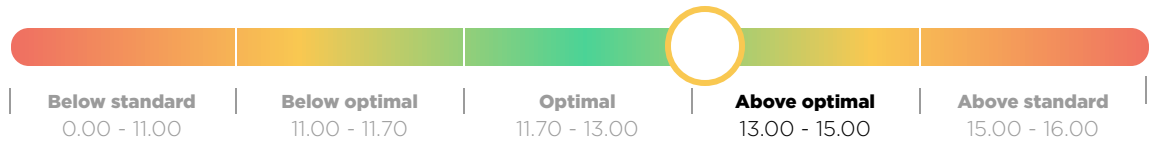
MCH  
29.80 pg



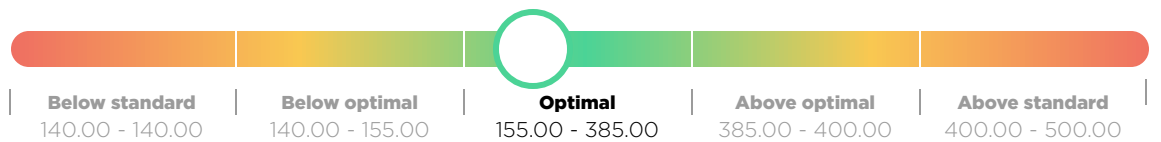
MCHC  
341.00 g/L



RDW   
13.10 %

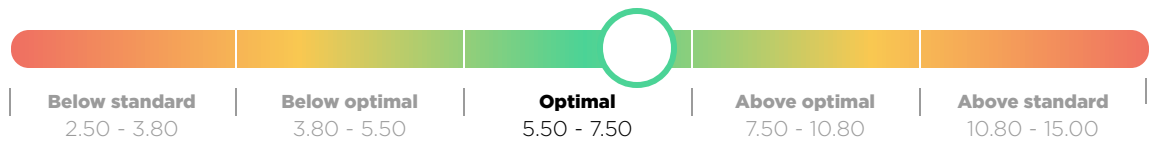


Platelets  
234.00 x10E9/L

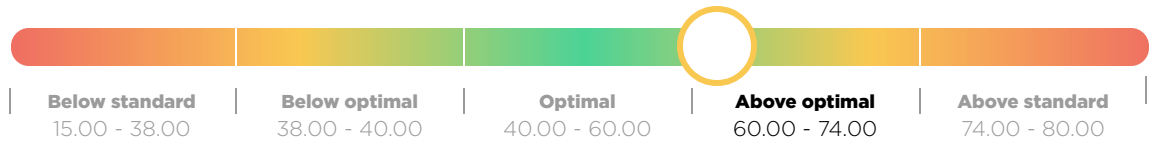


# WHITE BLOOD CELLS

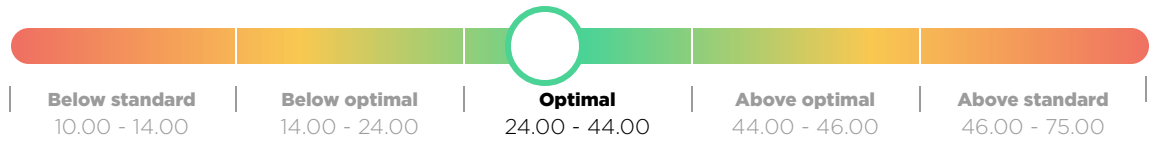
Total WBCs  
7.00 giga/L



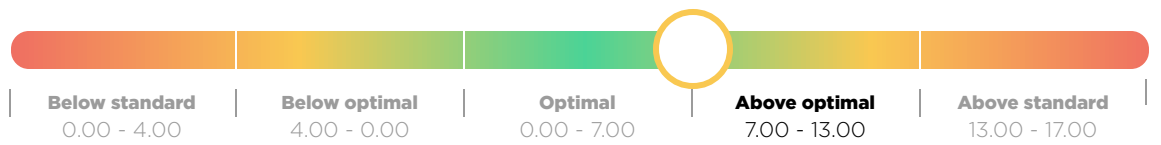
Neutrophils   
61.40 %



Lymphocytes  
31.40 %



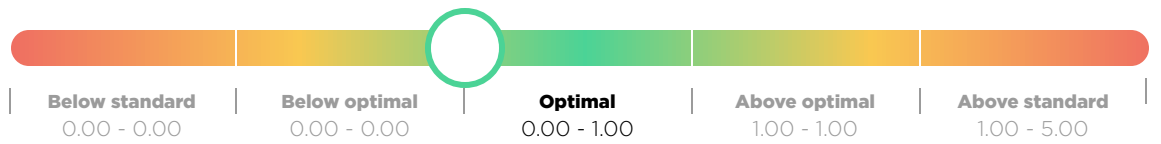
Monocytes   
7.10 %



Eosinophils  
1.40 %



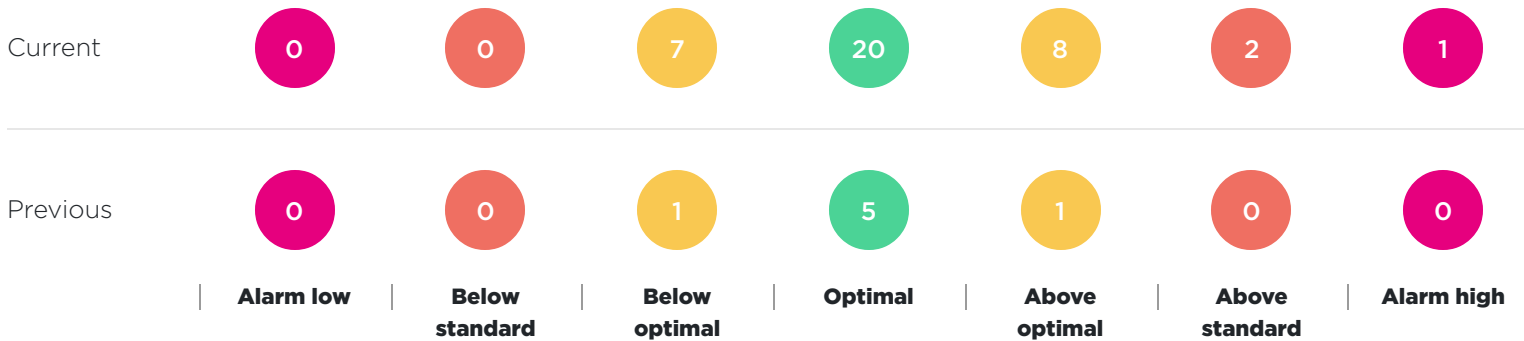
Basophils  
0.00 %



# Blood Test Results Comparative








The Blood Test Results Comparative Report lists the results of the 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



# Comparative Report

continued

Biomarker	Previous Sep 10 2014	Current Jan 19 2017	Optimal range	Standard range	Units	
Hemoglobin - Female		136.00	135.00 - 145.00	117.00 - 155.00	g/L	
Hematocrit - Female		0.39	0.37 - 0.44	0.35 - 0.45	Prop. of 1.0	
Total WBCs		7.00	5.50 - 7.50	3.80 - 10.80	giga/L	
RBC - Female		4.56	3.90 - 4.50	3.80 - 5.10	10E12/L	
MCV		88.00	82.00 - 89.90	80.00 - 100.00	fL	
MCH		29.80	28.00 - 31.90	27.00 - 33.00	pg	
MCHC		341.00	320.00 - 350.00	320.00 - 360.00	g/L	
RDW		13.10	11.70 - 13.00	11.00 - 15.00	%	
Platelets		234.00	155.00 - 385.00	140.00 - 400.00	x10E9/L	
Neutrophils		61.40	40.00 - 60.00	38.00 - 74.00	%	
Lymphocytes		31.40	24.00 - 44.00	14.00 - 46.00	%	
Monocytes		7.10	0.00 - 7.00	4.00 - 13.00	%	
Eosinophils		1.40	0.00 - 3.00	0.00 - 3.00	%	
Basophils		0.00	0.00 - 1.00	0.00 - 1.00	%	
Vitamin B12		346.00	260.00	332.01 - 590.24	147.56 - 811.58	pmol/L
Glucose		4.80	4.16 - 4.77	3.61 - 5.50	mmol/L	
Hemoglobin A1C		0.05	0.05	0.05 - 0.06	0.00 - 0.06	Proportion of 1.0
Creatinine		77.00	70.72 - 97.24	35.36 - 132.60	µmol/L	
eGFR Non-Afr. American		75.00	90.00 - 120.00	60.00 - 120.00	mL/min/1.73m2	
Sodium		142.00	135.00 - 142.00	135.00 - 146.00	mmol/L	
Potassium		4.40	4.00 - 4.50	3.50 - 5.30	mmol/L	
Chloride		101.00	100.00 - 106.00	98.00 - 110.00	mmol/L	
Alk Phos		47.00	70.00 - 100.00	35.00 - 115.00	IU/L	
GGT		14.00	10.00 - 30.00	3.00 - 70.00	IU/L	
Calcium		2.29	2.30 - 2.50	2.15 - 2.60	mmol/L	
Triglycerides		0.97	0.79 - 0.90	0.00 - 1.69	mmol/L	
Cholesterol - Total		6.80	4.14 - 4.65	3.23 - 5.17	mmol/L	
HDL Cholesterol		1.77	1.42 - 1.81	1.19 - 2.59	mmol/L	
Cholesterol/HDL Ratio		3.80	0.00 - 3.00	0.00 - 5.00	Ratio	
LDL Cholesterol		4.59 	0.00 - 3.11	0.00 - 3.37	mmol/L	
Hs CRP - Female		5.71	43.14	0.00 - 14.29	0.00 - 27.62	nmol/L
Magnesium		0.91	0.91 - 1.04	0.62 - 1.04	mmol/L	
Free T3		4.00	3.70	4.61 - 5.38	3.53 - 6.45	pmol/L
TSH		3.13	2.80	1.30 - 3.00	0.40 - 4.50	mIU/L
Free T4		15.00	12.00	12.87 - 19.30	10.30 - 23.17	pmol/L
Ferritin		68.00	116.00	30.00 - 70.00	10.00 - 232.00	µg/L
Sodium/Potassium Ratio		32.27	30.00 - 35.00	30.00 - 35.00	ratio	
Triglyceride/HDL Ratio		0.54	0.00 - 0.87	0.00 - 0.87	ratio	



# Blood Test Score Report

This report shows the biomarkers on the blood test that are farthest from optimal expressed as a %. The biomarkers that appear closest to the top and the bottom are those biomarkers that are farthest from optimal and should be carefully reviewed.

Biomarker	Lab result	Optimal range		% deviation	Optimal range	
		Low	High		Low	High
Cholesterol - Total	6.80	4.14	4.65	465		
Hs CRP - Female	43.14	0.00	14.29	252		
Ferritin	116.00	30.00	70.00	165		
Triglycerides	0.97	0.79	0.90	109		
LDL Cholesterol	4.59	0.00	3.11	98		
Cholesterol/HDL Ratio	3.80	0.00	3.00	77		
RBC - Female	4.56	3.90	4.50	60		
RDW	13.10	11.70	13.00	58		
Neutrophils	61.40	40.00	60.00	57		
Glucose	4.80	4.16	4.77	54		
Monocytes	7.10	0.00	7.00	51		
Sodium	142.00	135.00	142.00	50		
HDL Cholesterol	1.77	1.42	1.81	39		
TSH	2.80	1.30	3.00	38		
Potassium	4.40	4.00	4.50	30		
MCV	88.00	82.00	89.90	26		
Total WBCs	7.00	5.50	7.50	25		
MCHC	341.00	320.00	350.00	20		
Triglyceride/HDL Ratio	0.54	0.00	0.87	12		
Eosinophils	1.40	0.00	3.00	-3		
MCH	29.80	28.00	31.90	-4		
Sodium/Potassium Ratio	32.27	30.00	35.00	-5		
Hemoglobin A1C	0.05	0.05	0.06	-6		
Lymphocytes	31.40	24.00	44.00	-13		
Platelets	234.00	155.00	385.00	-16		
Hematocrit - Female	0.39	0.37	0.44	-21		
Creatinine	77.00	70.72	97.24	-26		
GGT	14.00	10.00	30.00	-30		
Chloride	101.00	100.00	106.00	-33		
Hemoglobin - Female	136.00	135.00	145.00	-40		
Basophils	0.00	0.00	1.00	-50		
Magnesium	0.91	0.91	1.04	-51		
Calcium	2.29	2.30	2.50	-55		
Free T4	12.00	12.87	19.30	-64		

Biomarker	Lab result	Optimal range		% deviation	Optimal range	
		Low	High		Low	High
Vitamin B12	260.00	332.01	590.24	-78		
eGFR Non-Afr. American	75.00	90.00	120.00	-100		
Alk Phos	47.00	70.00	100.00	-127		
Free T3	3.70	4.61	5.38	-168		

# Blood Test History

The Blood Test History Report lists the results of your 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 5 Test Results				
	Dec 10 2012	Aug 26 2013	May 28 2014	Sep 10 2014	Jan 19 2017
Glucose	5.20	4.50			4.80
Hemoglobin A1C	0.05	0.05	0.05	0.05	0.05
Insulin - Fasting		14.00		22.00	
BUN		5.00			
Creatinine	80.00	73.00	75.00		77.00
BUN/Creatinine Ratio		0.06			
eGFR Non-Afr. American	65.00	73.00	70.00		75.00
Sodium	142.00	141.00			142.00
Potassium	5.10	4.10			4.40
Chloride	105.00	105.00			101.00
CO2		31.00			
Sodium/Potassium Ratio	27.84	34.39			32.27
Anion gap		9.10			
Uric Acid - Female	222.00	245.00			
Creatine Kinase	2.00	2.84			
Protein - Total		73.00			
Albumin		44.00			
Calcium		2.33	2.36		2.29
Phosphorus	1.37	1.20	1.27		

Biomarker	Latest 5 Test Results					
	Dec 10 2012	Aug 26 2013	May 28 2014	Sep 10 2014	Jan 19 2017	
Magnesium		0.85	0.85	0.99	0.91	
Calcium/Albumin Ratio		0.05				
Calcium/Phosphorus Ratio		1.94	1.85			
Alk Phos		48.00	59.00		47.00	
AST (SGOT)		23.00	30.00			
ALT (SGPT)		21.00	26.00	20.00		
GGT			22.00		14.00	
LDH		180.00				
Bilirubin - Total		8.70	12.00			
Iron - Serum		20.00				
Ferritin		34.00	57.00	181.00	68.00	116.00
TIBC		66.00				
% Transferrin saturation		0.30				
Cholesterol - Total		6.35	5.84		6.80	
Triglycerides		0.61	0.94		0.97	
LDL Cholesterol		4.08 ▲	3.46		4.59 ▲	
HDL Cholesterol		1.99	1.95		1.77	
Cholesterol/HDL Ratio		3.19	3.00		3.80	
Triglyceride/HDL Ratio		0.31	0.48		0.54	
TSH		2.05	3.15	1.69	3.13	2.80
Free T4		10.90	14.00	16.00	15.00	12.00
Total T3		1.30				
Free T3		4.50	4.10	4.00	3.70	
Thyroid Peroxidase (TPO) Abs			9.90			
Hs CRP - Female		6.67	5.71	43.14		
Vitamin D (25-OH)		81.00	149.00			
Vitamin B12		504.00	346.00	260.00		

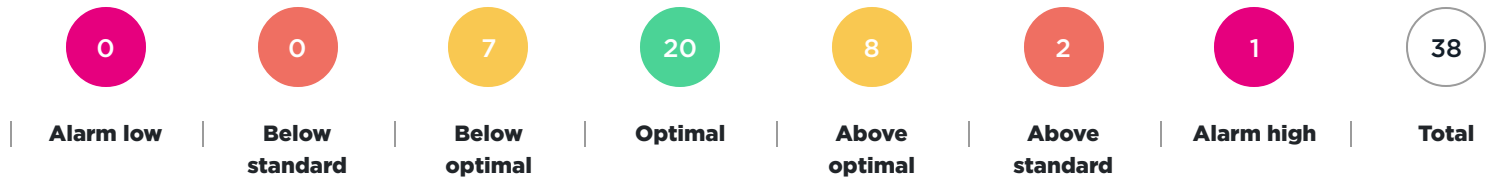
Biomarker	Latest 5 Test Results				
	Dec 10 2012	Aug 26 2013	May 28 2014	Sep 10 2014	Jan 19 2017
DHEA-S - Female		4.80	4.00	5.00	
Testosterone Total - Female		0.50			
Testosterone Free - Female		0.07 ▲	2.90	0.50 ▲	
Estradiol - Female		106.00	69.00	45.00 ▲	
Progesterone - Female				0.90	
RBC - Female		4.60	4.47	4.31	4.56
Hemoglobin - Female		144.00	132.00	133.00	136.00
Hematocrit - Female		0.41	0.37	0.39	0.39
MCV		91.20	83.70	89.00	88.00
MCH		31.30	29.50	31.00	29.80
MCHC		344.00	353.00	344.00	341.00
RDW		12.90	12.70	13.00	13.10
Platelets		213.00	219.00	343.00	234.00
Total WBCs		6.30	6.30	6.60	7.00
Neutrophils		46.00	44.40	50.00	61.40
Lymphocytes		47.60	47.60	43.00	31.40
Monocytes		6.30	4.80	8.00	7.10
Basophils		0.00	1.60	0.00	0.00
Eosinophils		1.60	1.60	1.10	1.40

# 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

6.80  
mmol/L

## CHOLESTEROL - TOTAL

Cholesterol is a steroid found in every cell of the body and in the plasma. It is an essential component in the structure of the cell membrane where it controls membrane fluidity. It provides the structural backbone for every steroid hormone in the body, which includes adrenal and sex hormones and vitamin D. The myelin sheaths of nerve fibers are derived from cholesterol and the bile salts that emulsify fats are composed of cholesterol. Cholesterol is made in the body by the liver and other organs, and from dietary sources. The liver, the intestines, and the skin produce between 60-80% of the body's cholesterol. The remainder comes from the diet. An increased cholesterol is just one of many independent risk factors for cardiovascular disease. It is also associated with metabolic syndrome, hypothyroidism, biliary stasis, and fatty liver.

43.14  
nmol/L

## HS CRP - FEMALE

High Sensitivity C-Reactive Protein (Hs-CRP) is a blood marker that can help indicate the level of chronic inflammation in the body. Increased levels are associated with an increased risk of inflammation, cardiovascular disease, stroke, and diabetes.

116.00  
µg/L

## FERRITIN

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

0.97  
mmol/L

## TRIGLYCERIDES

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

4.59  
mmol/L

### LDL CHOLESTEROL [📄](#) [⚠️](#)

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

3.80  
Ratio

### CHOLESTEROL/HDL RATIO [📄](#)

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

4.56  
10E12/L

### RBC - FEMALE [📄](#)

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.

13.10  
%

### RDW [📄](#)

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

61.40  
%

### NEUTROPHILS [📄](#)

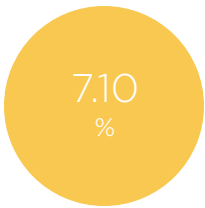
Neutrophils are the white blood cells used by the body to combat bacterial infections. They are the most numerous and important white cell in the body's reaction to inflammation. Levels will be increased in bacterial infections.

4.80  
mmol/L

### GLUCOSE [📄](#)

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





## 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.

# Below Optimal

3.70  
pmol/L

## FREE T3 [↗](#)

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 decreased with hypothyroidism and is associated with selenium deficiency.

47.00  
IU/L

## ALK PHOS [↗](#)

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

75.00  
mL/min/1.73m<sup>2</sup>

## EGFR NON-AFR. AMERICAN [↗](#)

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.

260.00  
pmol/L

## VITAMIN B12 [↗](#)

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

12.00  
pmol/L

## FREE T4 [↗](#)

T-4 is the major hormone secreted by the thyroid gland. T-4 production and secretion from the thyroid gland are stimulated by the pituitary hormone TSH. Deficiencies of zinc, copper, and vitamins A, B2, B3, B6 and C will cause a decrease in production of T4 by the follicles of the thyroid gland. Free T-4 is the unbound form of T4 in the body. Only about 0.03 - 0.05% of circulating T4 is in the free form. Free T-4 will be decreased in hypothyroidism and is associated with iodine deficiency.

2.29  
mmol/L

## CALCIUM [↗](#)

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

0.91  
mmol/L

## MAGNESIUM

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



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

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## Health Improvement Plan

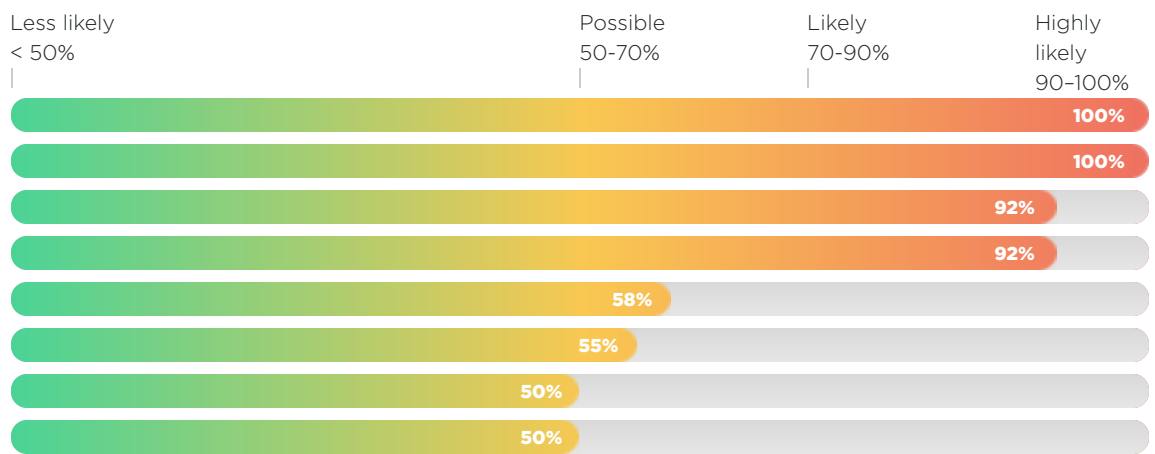
36 Health Improvement

# Health Improvement

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

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

## NEEDS ATTENTION



# Health Improvement Details

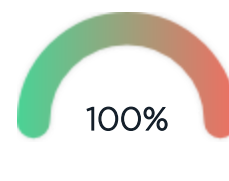
This section contains detailed descriptions and explanations of the results presented in the Health Improvement Plan report including all the biomarkers considered in the algorithmic analysis and the rationale behind the interpretation.

## HYPERLIPIDEMIA [🔗](#)

The results of your blood test indicate that you have higher than optimal levels of cholesterol and fat in your blood (a condition called hyperlipidemia), which is associated with an increased risk of cardiovascular disease. There is a need for cardiovascular support, especially support to help lower excessive blood fats.

### Rationale

Cholesterol - Total [↑](#), Triglycerides [↑](#), LDL Cholesterol [↑](#)

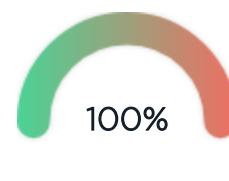


## ZINC NEED [🔗](#)

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

### Rationale

Alk Phos [↓](#)

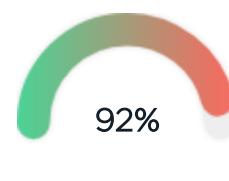


## METABOLIC SYNDROME [🔗](#)

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

### Rationale

Glucose [↑](#), Triglycerides [↑](#), Cholesterol - Total [↑](#), LDL Cholesterol [↑](#)

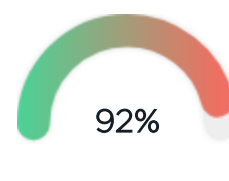


## VITAMIN B12/FOLATE NEED [🔗](#)

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

### Rationale

RDW [↑](#), Vitamin B12 [↓](#)

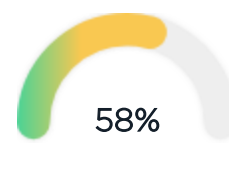


## INCREASED CARDIOVASCULAR RISK [🔗](#)

The results of your blood test indicate a higher than optimal cardiovascular risk and show a need for cardiovascular support.

### Rationale

Glucose [↑](#), Cholesterol - Total [↑](#), Triglycerides [↑](#), LDL Cholesterol [↑](#), Hs CRP - Female [↑](#)

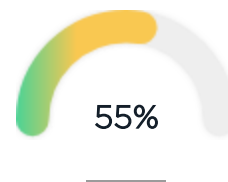


## BACTERIAL INFECTION [🔗](#)

The results of your blood test indicate a tendency towards a bacterial infection and a need for immune support.

### Rationale

Neutrophils [↑](#), Monocytes [↑](#)

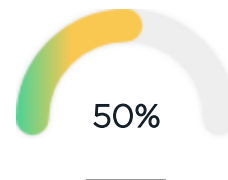


## SELENIUM NEED [🔗](#)

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

### Rationale

Free T3 [↓](#)

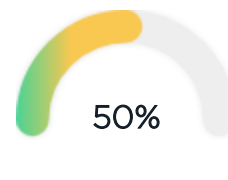


## THYROID CONVERSION ISSUES [🔗](#)

The results of your blood test indicate a tendency towards a difficulty converting thyroxine (T4) into triiodothyronine (T3), which can cause symptoms of hypothyroidism, and a need for thyroid gland support.

### Rationale

Free T3 [↓](#)



# 5

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

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## Appendix

40 Disclaimer





# Disclaimer

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