



FunctionalDX



MaxDX
Functional
Performance
Analysis



Professional Report

Prepared for	John Doe
Requested by	Mr. Jonathan Cohen FDx Clinic
Test date	Nov 01, 2016

An introduction to functional blood chemistry analysis and your report.

Introduction

- 3 What's Inside?
- 4 Functional BCA
- 5 Professional Report



What's Inside?

An introduction to functional blood chemistry analysis and your report.

Your view into your client's health through an in-depth functional system and nutrient evaluation.

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

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

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Functional Blood Chemistry Analysis

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

WHY BLOOD TESTING?

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

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

"NORMAL" IS NOT OPTIMAL

Most patients who feel "unwell" will come out "normal" on a blood test. Clinical experience suggests that these people are by no means "normal" and are a far cry from being functionally optimal. They may not yet have progressed to a known disease state but they are what we call dysfunctional, 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 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.

Professional Report

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



MR. JONATHAN COHEN

Practitioner

THE FUNCTIONAL HEALTH REPORT

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

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

ASSESSMENT

The Assessment section is at the very heart of the Functional Health Report. It is here that the findings of the algorithmic trend analysis are presented. The Body Systems and Accessory Reports show the level of dysfunction that exists in the various physiological and supporting accessory systems in the body. The Nutrient Systems report gives you an indication of your client's general nutritional status as well as the degree of deficiency for individual nutrients.

All the information on the Assessment section of the report is summarized in the Health Improvement Plan, which focuses on the top areas of need as presented in this report.

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.

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.

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 Deviation from Optimal report is made showing which markers exhibit the largest shifts away from an optimal norm either higher or lower.

APPENDIX

The appendices contain highly detailed descriptions and interpretation explanations of the results presented in each of the reports in the assessment and analysis sections.

Here you will be able to read in depth what each biomarker means, see the patterns used in the algorithmic analysis and see what factors have gone into the creation of the health trend assessment levels reported.

This section is both informative and highly educational.

Your view into your client's health through an in-depth functional system and nutrient evaluation.

Assessment

- 7 Functional Body Systems
- 8 Accessory Systems
- 9 Macronutrient Status
- 10 Nutrient Deficiencies
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- 14 Recommended Further Testing



Functional Body Systems

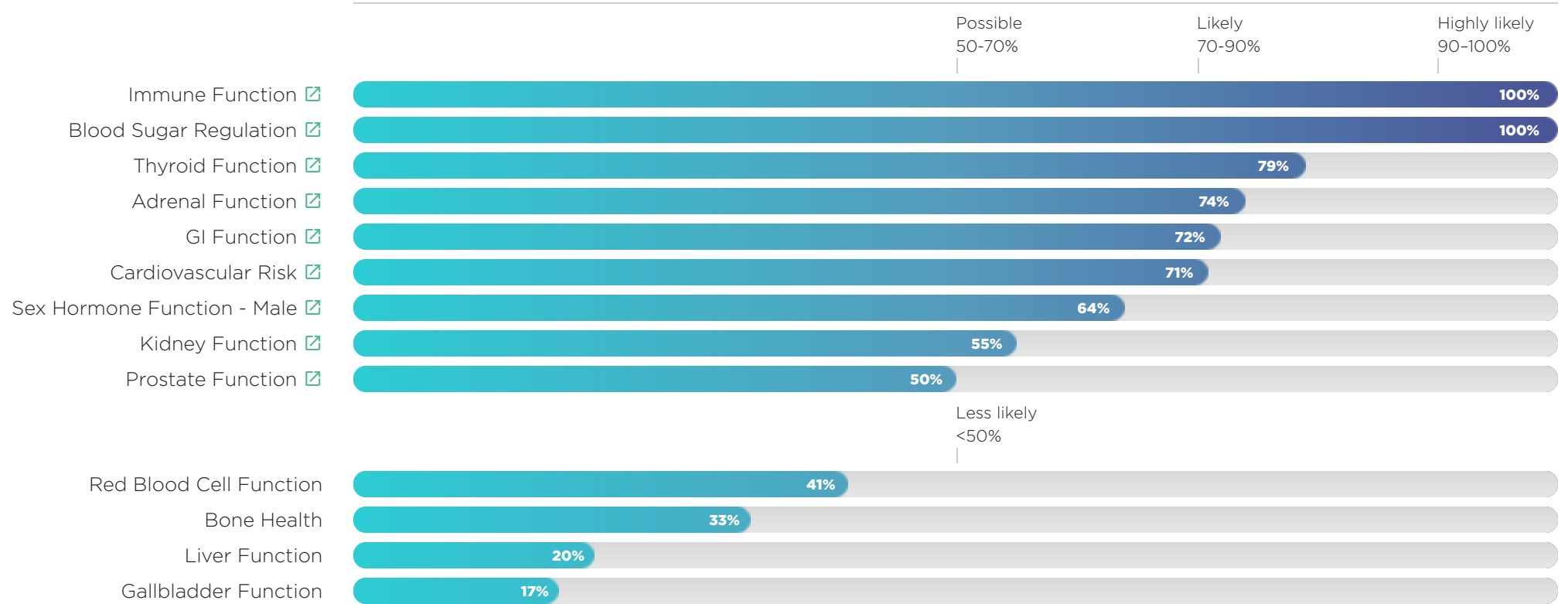
The Functional Body System results opposite represent an algorithmic analysis of this blood test. These results have been converted into your client's individual Functional Body Systems Report based on our latest research.

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 hyperlinked into the appendix section so you can read a highly detailed description and individual explanation of the results shown in this report.

PROBABILITY OF DYSFUNCTION

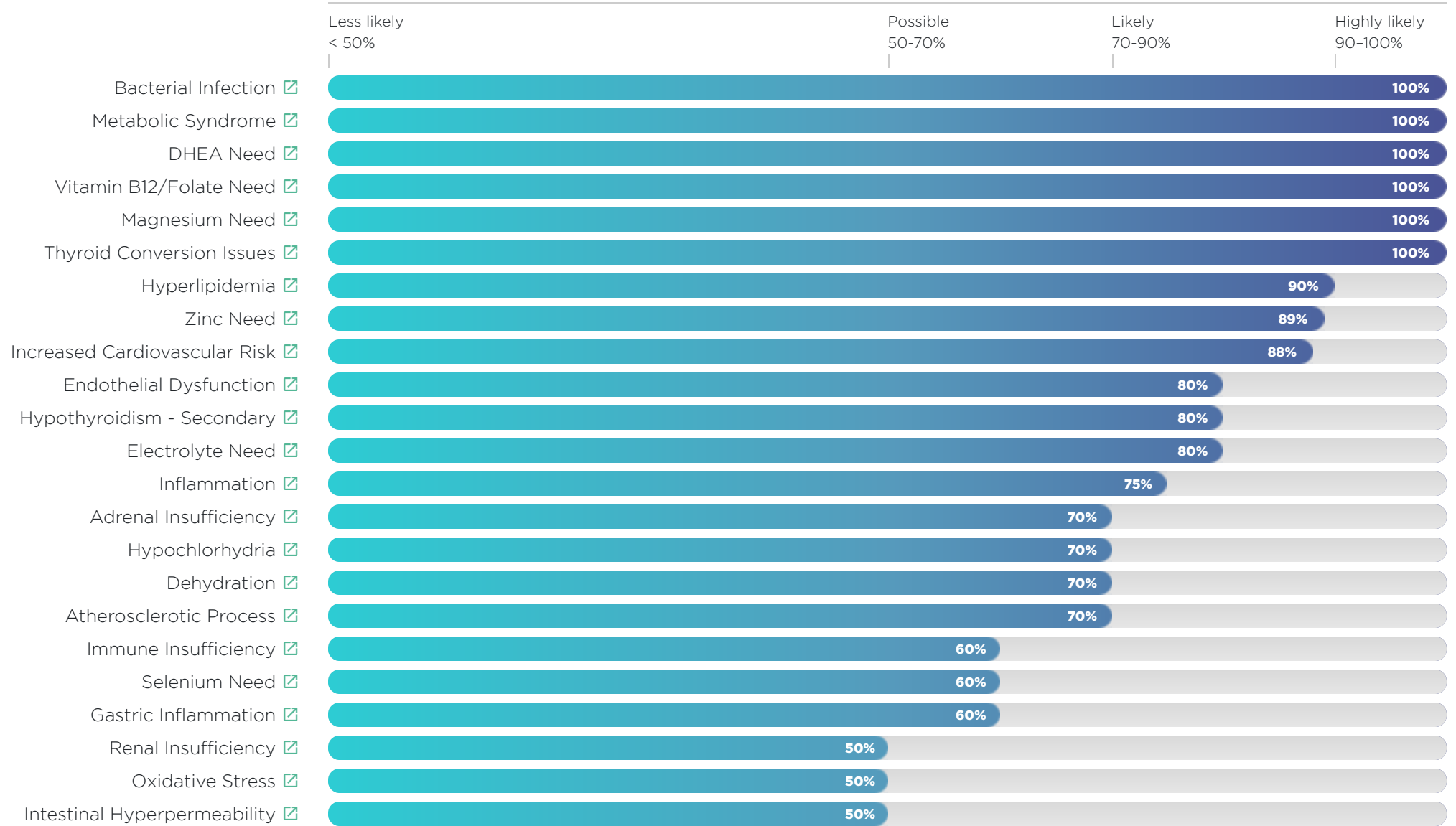


Health Improvement Plan

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

NEEDS ATTENTION



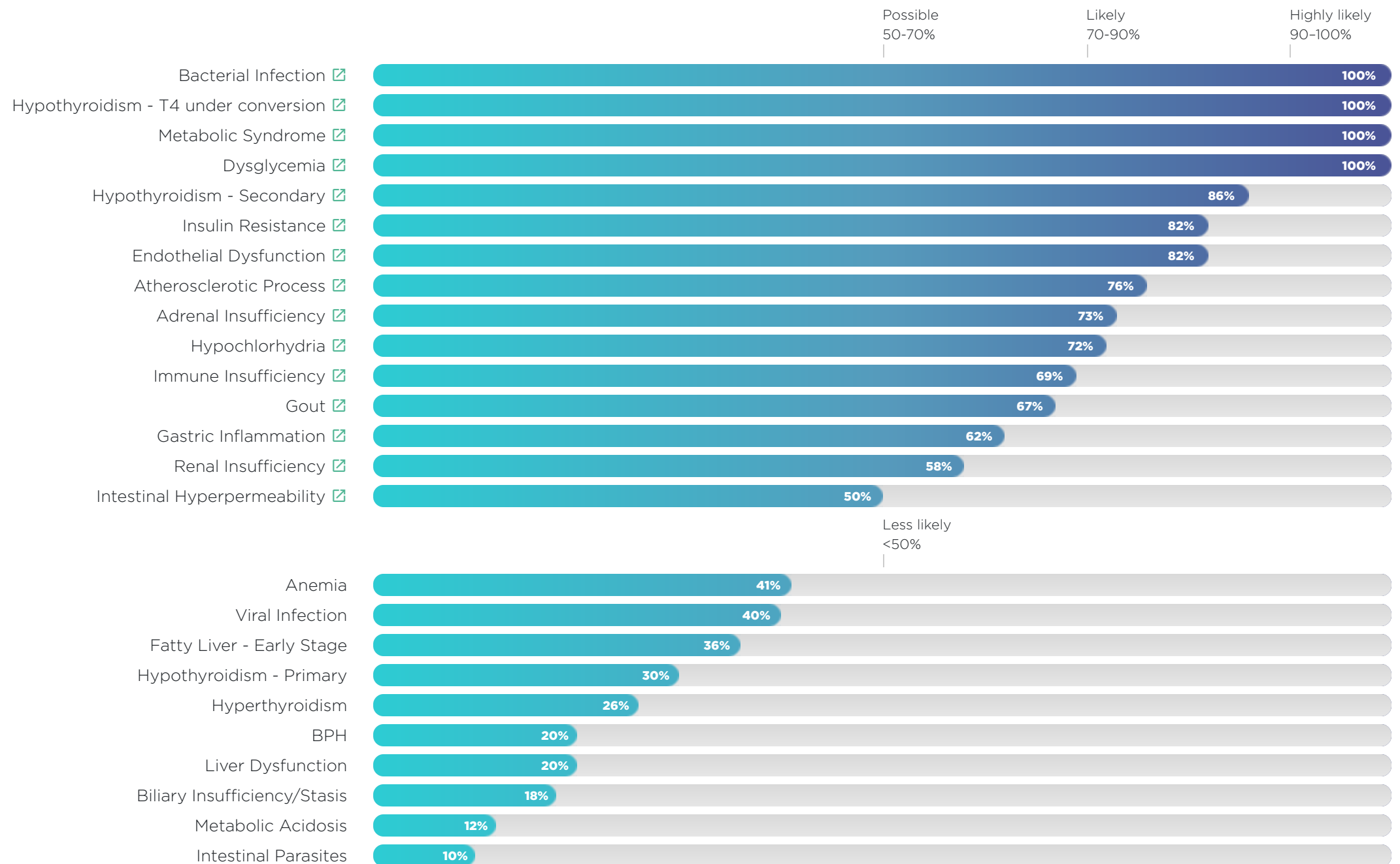
Clinical Dysfunctions

Advanced practitioner only report

The Clinical Dysfunctions Report shows a list of likely Health Concerns and Nutrient Deficiencies 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 hyperlinked into the appendix section so you can read a highly detailed description and individual explanation of the results shown in this report.

HEALTH CONCERNS



3

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

Analytics

- 16 Blood Test Results
- 30 Blood Test Results Comp.
- 34 % Deviation From Optimal
- 37 Blood Test History
- 48 Out of Optimal Range

Blood Test Results

Blood Test Results Comp. % Deviation From Optimal Blood Test History Out of Optimal Range



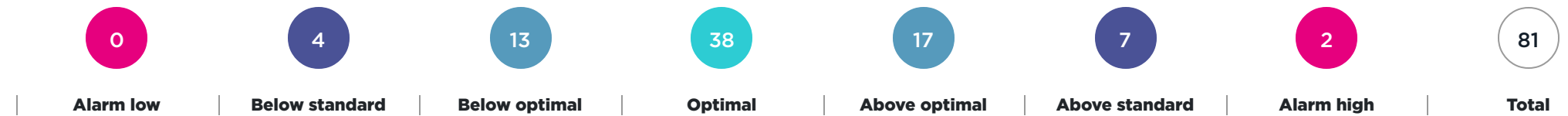
Blood Glucose Renal Prostate Electrolytes Metabolic Proteins Minerals
 Liver and Gallbladder Iron Markers Lipids Thyroid Inflammation/Oxidation Vitamins Hormones
 CBC/Hematology White Blood Cells

Blood Test Results

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

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

Total number of biomarkers by optimal range



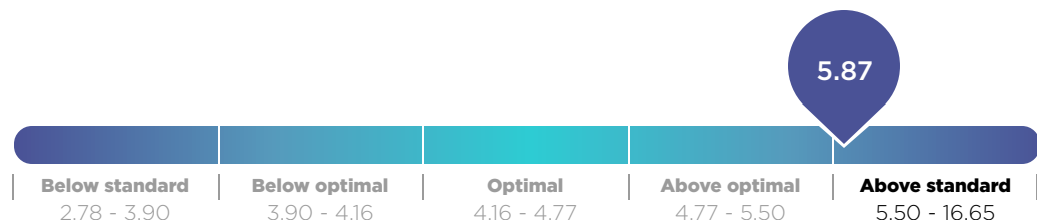
Blood Test Results

Blood Test Results Comp. % Deviation From Optimal Blood Test History Out of Optimal Range

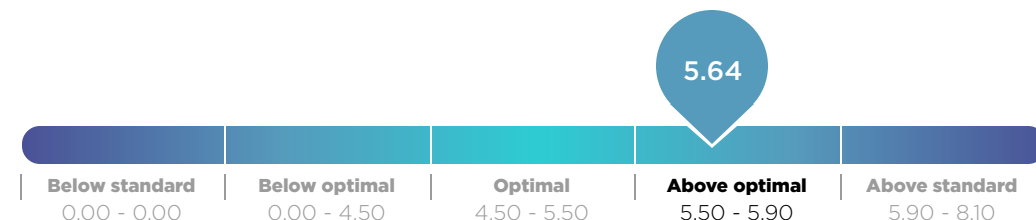
Blood Glucose Renal Prostate Electrolytes Metabolic Proteins Minerals
 Liver and Gallbladder Iron Markers Lipids Thyroid Inflammation/Oxidation Vitamins Hormones
 CBC/Hematology White Blood Cells

BLOOD GLUCOSE

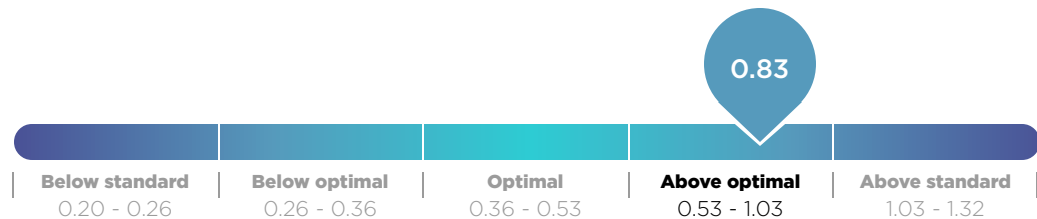
Glucose [🔗](#)
mmol/L



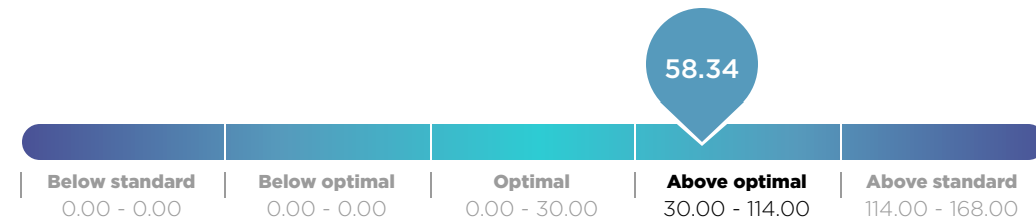
Haemoglobin A1C [🔗](#)
%



C-Peptide [🔗](#)
nmol/L

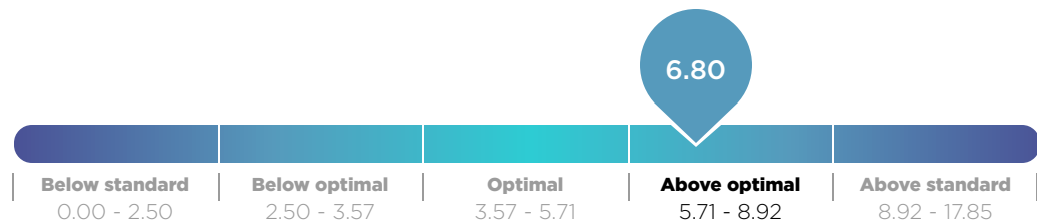


Insulin - Fasting [🔗](#)
pmol/L

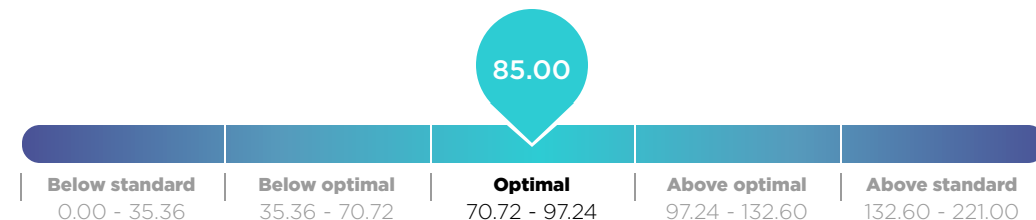


RENAL

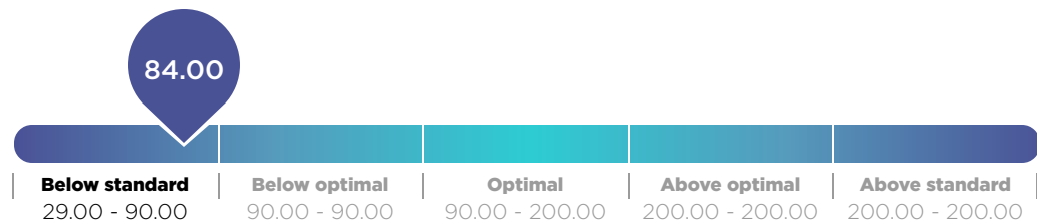
Urea [🔗](#)
mmol/L



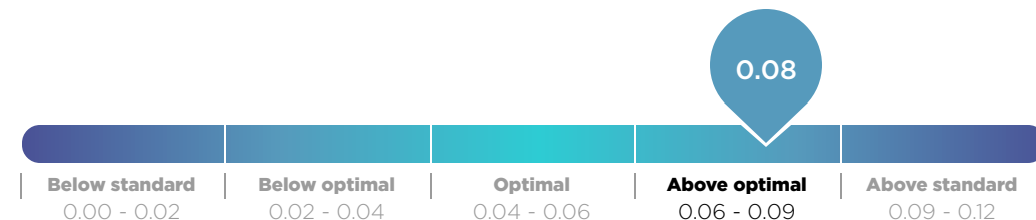
Creatinine [🔗](#)
umol/L



eGFR [🔗](#)
mL/min



BUN:Creatinine [🔗](#)
Ratio



Blood Test Results

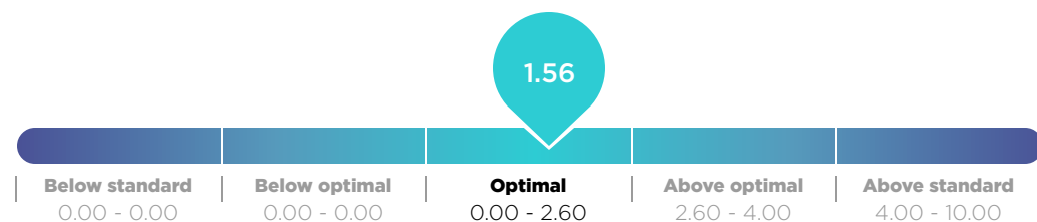
Blood Test Results Comp. % Deviation From Optimal Blood Test History Out of Optimal Range

Blood Glucose Renal Iron Markers Prostate Lipids Electrolytes Thyroid Metabolic Inflammation/Oxidation Proteins Vitamins Minerals Hormones



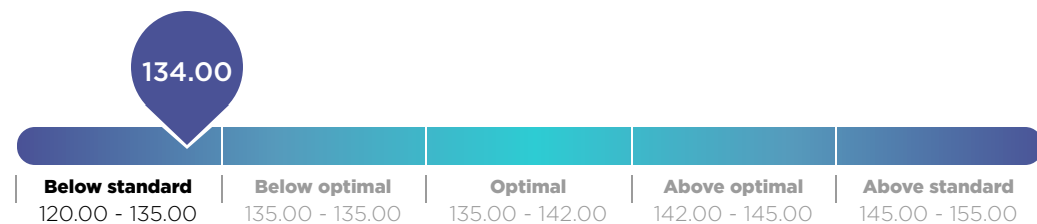
PROSTATE

PSA
ng/ml

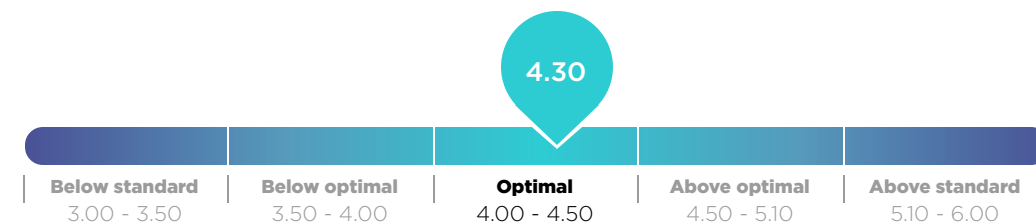


ELECTROLYTES

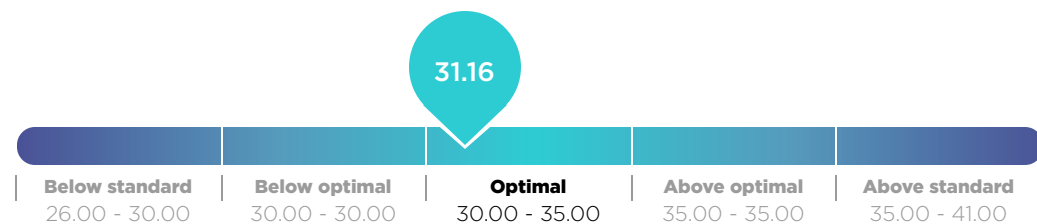
Sodium
mmol/L



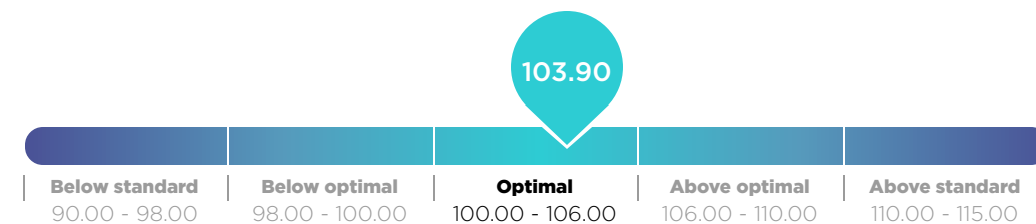
Potassium
mmol/L



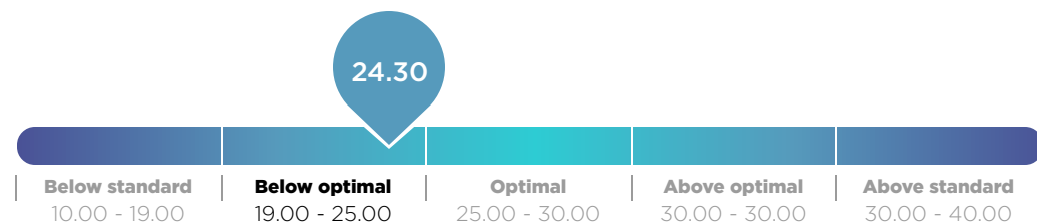
Sodium/Potassium
Ratio



Chloride
mmol/L



CO2
mmol/L



Comparative Report

continued

Biomarker	Current Nov 01 2016	Optimal range	Standard range	Units
RBC - Male	4.97	4.20 - 4.90	4.20 - 5.80	x10*12/L
Haemoglobin - Male	166.00	140.00 - 150.00	132.00 - 171.00	g/L
Haematocrit - Male	0.50	0.40 - 0.48	0.38 - 0.50	Prop. of 1.0
MCV	102.20	82.00 - 89.90	80.00 - 100.00	fL
MCH	33.40	28.00 - 31.90	27.00 - 33.00	pg
MCHC	327.00	320.00 - 350.00	320.00 - 360.00	g/L
RDW	14.50	11.70 - 13.00	11.00 - 15.00	%
Total WBCs	6.59	5.50 - 7.50	3.80 - 10.80	x10*9/l
Neutrophils	71.40	40.00 - 60.00	38.00 - 74.00	%
Lymphocytes	15.80	24.00 - 44.00	14.00 - 46.00	%
Monocytes	11.10	0.00 - 7.00	4.00 - 13.00	%
Eosinophils	1.20	0.00 - 3.00	0.00 - 3.00	%
Basophils	0.50	0.00 - 1.00	0.00 - 1.00	%
Platelets	270.00	155.00 - 385.00	140.00 - 400.00	x10*9/l
Glucose	5.87	4.16 - 4.77	3.90 - 5.50	mmol/L
Haemoglobin A1C	5.64	4.50 - 5.50	0.00 - 5.90	%
Iron - Serum	18.70	15.22 - 23.27	5.83 - 34.50	µmol/L
Cholesterol - Total	6.03	4.14 - 4.65	3.23 - 5.17	mmol/L
Triglycerides	0.95	0.79 - 0.90	0.00 - 1.69	mmol/L
HDL Cholesterol	1.99	1.42 - 1.81	1.19 - 2.59	mmol/L
LDL Cholesterol	3.60	0.00 - 3.11	0.00 - 3.37	mmol/L
VLDL Cholesterol	0.44	0.00 - 2.59	0.00 - 7.51	mmol/L
Cholesterol:HDL	3.03	0.00 - 4.00	0.00 - 5.00	Ratio
Triglyceride:HDL	0.47	0.00 - 0.87	0.00 - 0.87	Ratio
Alk Phos	46.00	70.00 - 100.00	40.00 - 129.00	U/L
AST (SGOT)	23.00	10.00 - 26.00	0.00 - 32.00	IU/L
ALT (SGPT)	17.00	10.00 - 26.00	0.00 - 33.00	U/L
GGT	14.00	10.00 - 30.00	3.00 - 70.00	U/L
Protein - Total	65.90	69.00 - 74.00	64.00 - 83.00	g/L
Albumin	45.30	40.00 - 50.00	35.00 - 52.00	g/L
Globulin - Total	20.60	24.00 - 28.00	19.00 - 37.00	g/L
Albumin:Globulin	2.19	1.40 - 2.10	0.90 - 2.00	Ratio
Bilirubin - Total	4.00	1.71 - 15.39	3.42 - 20.52	µmol/L
Bilirubin - Direct	2.70	0.00 - 3.25	0.00 - 3.42	Umol/L

% Deviation 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
Sex Hormone Binding Globulin - Male	91.50	30.00	40.00	565		
Hs CRP - Male	21.52	0.00	5.24	361		
Cholesterol - Total	6.03	4.14	4.65	316		
C-Peptide	0.83	0.36	0.53	231		
Glucose	5.87	4.16	4.77	230		
Haemoglobin - Male	166.00	140.00	150.00	210		
MCV	102.20	82.00	89.90	206		
Homocysteine	15.60	0.00	7.20	167		
RDW	14.50	11.70	13.00	165		
Testosterone Total - Male	33.50	24.27	28.95	147		
Insulin - Fasting	58.34	0.00	30.00	144		
BUN:Creatinine	0.08	0.04	0.06	114		
Monocytes	11.10	0.00	7.00	109		
Neutrophils	71.40	40.00	60.00	107		
% Transferrin saturation	43.10	20.00	35.00	104		
Urea	6.80	3.57	5.71	101		
HDL Cholesterol	1.99	1.42	1.81	96		
Triglycerides	0.95	0.79	0.90	91		
MCH	33.40	28.00	31.90	88		
Calcium:Phosphorous	2.20	1.78	2.09	86		
Haematocrit - Male	0.50	0.40	0.48	75		
LDL Cholesterol	3.60	0.00	3.11	66		
Haemoglobin A1C	5.64	4.50	5.50	64		
Albumin:Globulin	2.19	1.40	2.10	63		
RBC - Male	4.97	4.20	4.90	60		
Uric Acid - Male	359.00	208.18	350.93	56		
Ferritin	67.50	30.00	70.00	44		
Bilirubin - Direct	2.70	0.00	3.25	33		
Fibrinogen	8.29	5.88	8.82	32		
AST (SGOT)	23.00	10.00	26.00	31		
Estradiol - Male	102.05	73.42	110.13	28		
Calcium:Albumin	0.05	0.00	0.06	27		
Cholesterol:HDL	3.03	0.00	4.00	26		

Blood Test History

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

Key

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

Biomarker	2016 Nov 1
GLUCOSE	5.87
INSULIN - FASTING	58.34
UREA	6.8

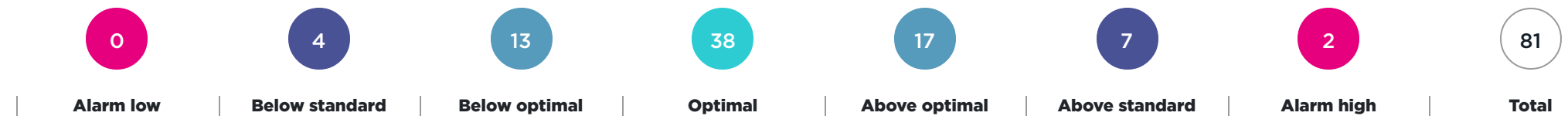
Biomarker	2016 Nov 1
HAEMOGLOBIN A1C	5.64
C-PEPTIDE	0.83
CREATININE	85

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

91.50
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, uterus, brain, and placenta. SHBG acts as a transport molecule for carrying estrogen and testosterone around the body and delivering them to receptors on the cells.

6.03
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. Decreased cholesterol levels are a strong indicator of gallbladder dysfunction, oxidative stress, inflammatory process, low fat diets and an increased heavy metal burden.

21.52
nmol/L

HS CRP - MALE [🔗](#)

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.

0.83
nmol/L

C-PEPTIDE [🔗](#)

C-Peptide is used as an indicator for insulin production from the pancreas. It can help assess whether a high blood glucose is due to reduced insulin output from the pancreas or due to reduced glucose uptake by the cells, a condition called insulin resistance.

4

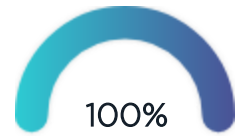
Highly detailed and interpretive descriptions of the results presented in each of the assessment and analysis section reports.

Appendix

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Functional Body Systems Details

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



Dysfunction Highly Likely.
Much improvement required.

IMMUNE FUNCTION [🔗](#)

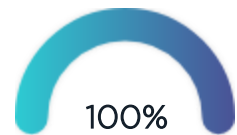
The Immune Function score allows us to assess the functional health of your patient's immune system. A high Immune Function score indicates that there is dysfunction within your patient's immune system and further assessment is needed to pinpoint exactly what that dysfunction is. Some of the factors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

Rationale

Globulin - Total ↓, Neutrophils ↑, Lymphocytes ↓, Monocytes ↑, Alk Phos ↓

Biomarkers considered

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



Dysfunction Highly Likely.
Much improvement required.

BLOOD SUGAR REGULATION [🔗](#)

The Blood Sugar Regulation score allows us to assess the functional health of your patient's blood sugar regulation. A high Blood Sugar Regulation score indicates that there is dysfunction in this patient's blood sugar regulation. Blood sugar dysregulation is affected by genetics, diet, lifestyle, nutrition, and environment. Some factors to consider include hypoglycemia, metabolic syndrome, insulin resistance, hyperinsulinemia, and type 2 Diabetes.

Rationale

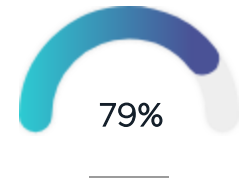
Glucose ↑, Haemoglobin A1C ↑, Insulin - Fasting ↑, Cholesterol - Total ↑, LDL Cholesterol ↑, DHEA-S - Male ↓, C-Peptide ↑

Biomarkers considered

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

Patient result not available - consider running in future tests:

Fructosamine



Dysfunction Likely.
Improvement required

THYROID FUNCTION [🔗](#)

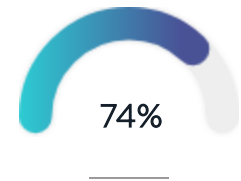
The Thyroid Function score allows us to assess the functional health of your patient's thyroid. A high Thyroid score indicates that there is dysfunction in your patient's thyroid and there is a need for further assessment and treatment. There is a strong likelihood that there's significant distress in the systems that help regulate the thyroid gland in the body. This may be caused by increased levels of stress, adrenal insufficiency, iodine and/or selenium deficiency, liver dysfunction, kidney insufficiency, a low-calorie diet etc. Consider that the dysfunction might be a hyperactive thyroid (hyperthyroid) or a hypothyroid situation: primary hypothyroidism (a dysfunction in the thyroid itself), secondary hypothyroidism (dysfunction in the anterior pituitary), or low T3 syndrome (T4 under conversion).

Rationale

TSH ↓, Total T3 ↓, Free T3 ↓

Biomarkers considered

TSH, Total T4, Free T4, Total T3, Free T3, Reverse T3, T3 Uptake, Free Thyroxine Index (T7), Thyroglobulin Abs, Thyroid Peroxidase (TPO) Abs



Dysfunction Likely.
Improvement required

ADRENAL FUNCTION [🔗](#)

The Adrenal Function score allows us to assess the functional health of your patient's adrenal glands. A high Adrenal Function score indicates that there is dysfunction within your patient's adrenal system and further assessment is needed to find out what the dysfunction is. Consider factors that contribute to adrenal hyperactivity, stress, or adrenal insufficiency.

Rationale

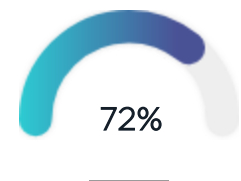
Sodium ↓, Urea ↑, Cholesterol - Total ↑, Triglycerides ↑, DHEA-S - Male ↓

Biomarkers considered

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

Patient result not available - consider running in future tests:

Cortisol - AM, Cortisol - PM



Dysfunction Likely.
Improvement required

GI FUNCTION [🔗](#)

The GI Function score allows us to assess the functional health of your patient's GI system. A high GI Function score indicates that there is dysfunction within your patient's GI system and further assessment is needed to pinpoint exactly what that dysfunction is. Some of the factors to consider include hypochlorhydria, gastric inflammation, Helicobacter pylori, pancreatic insufficiency, dysbiosis and intestinal hyperpermeability.

Rationale

Urea ↑, Protein - Total ↓, Globulin - Total ↓, Alk Phos ↓, MCV ↑, Uric Acid - Male ↑

Biomarkers considered

Urea, Protein - Total, Globulin - Total, Albumin, Phosphorus, Alk Phos, MCV, Eosinophils, Basophils, Iron - Serum, Creatinine, Chloride, Anion Gap, Uric Acid - Male, Calcium, GGT, Total WBCs, Haemoglobin - Male