PracticeRx

CONCIERGE MEDICINE

Functional Health Report

A comprehensive analysis of your patient's test results.

BLOOD CHEMISTRY ANALYSIS

Practitioner Report

Prepared for	Jane Doe 48 year old female born Feb 27, 1977 Fasting
Requested by	Dr. Clay Hall Practice Rx
Collected Date	May 16, 2025
Lab	Lab Corp
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1

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

Introduction

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.

Dr. Clay Hall
Practice Rx

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 reference 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" ranges represent "average" populations rather than the optimal level required to maintain good health. Most "normal" reference 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" reference 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.

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Practice Rx

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 optimal, outside of the optimal range or outside of the standard 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.

2

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

Analytics

Blood Test Results

The Blood Test Results Report lists the results of your patient's Chemistry Screen and CBC and shows you whether or not an individual biomarker is optimal, outside of the optimal range, or outside of the standard 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 marked Low or High 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.

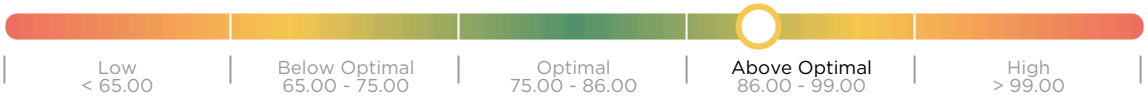
0	1	6	33	16	3	0	63
Alarm Low	Low	Below Optimal	Optimal	Above Optimal	High	Alarm High	Total

BLOOD GLUCOSE

Blood glucose regulation markers provide a comprehensive assessment of metabolic health, insulin sensitivity, and pancreatic function, offering insights that extend beyond traditional fasting glucose measurements. Advanced glycemic markers and calculated indices enable you to detect metabolic dysfunction at earlier stages, assess beta cell function, and evaluate insulin resistance patterns, allowing for more precise and personalized interventions.

Glucose Fasting

90.00 mg/dL

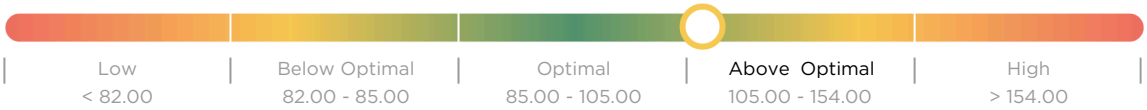


Hemoglobin A1C

5.40 %

eAG

108.28 mg/dL

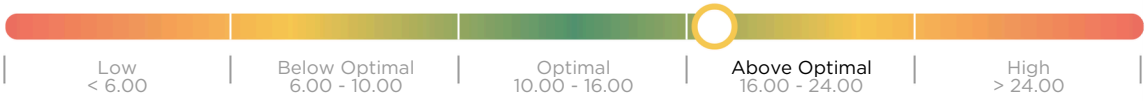


RENAL

Kidney and renal biomarkers offer a comprehensive view of glomerular filtration efficiency, protein metabolism, and overall excretory function. Evaluating these indicators helps detect subtle declines in renal performance long before overt pathology arises. Early detection allows for proactive interventions—such as optimizing hydration, adjusting dietary protein intake, and reducing potential nephrotoxic exposures—to preserve renal health. Integrative strategies may also address systemic factors, including inflammation and metabolic imbalances, ensuring the kidneys can continue to effectively filter waste and maintain electrolyte balance.

BUN

17.00 mg/dL

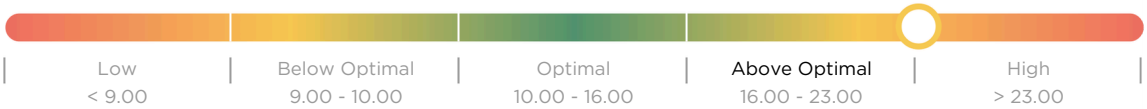


Creatinine

0.73 mg/dL

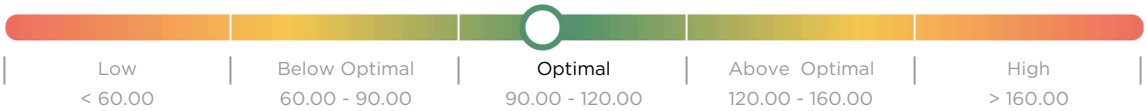
BUN : Creatinine

23.00 Ratio



eGFR

101.00 mL/min

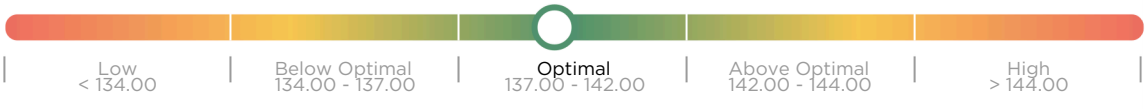


ELECTROLYTES

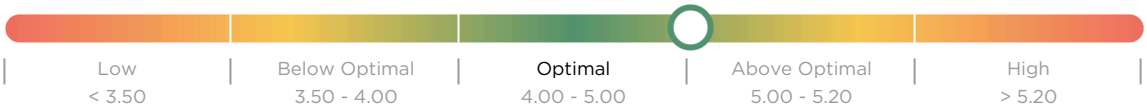
Electrolytes are essential for maintaining cellular function, fluid balance, and acid-base homeostasis. Dysregulation in electrolyte levels can indicate underlying metabolic disturbances, adrenal dysfunction, or renal imbalances, which may contribute to fatigue, cardiovascular stress, or neuromuscular issues. Evaluating sodium, potassium, chloride, and carbon dioxide levels and their ratios can provide insights into hydration status, adrenal health, and systemic pH regulation. Supporting electrolyte balance through targeted nutrition, stress management, and proper hydration can optimize cellular function and overall physiological resilience.

Sodium

139.00 mEq/L



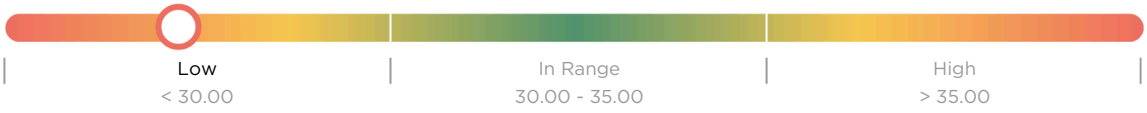
Potassium
5.00 mEq/L



Chloride
103.00 mEq/L

CO2
24.00 mEq/L

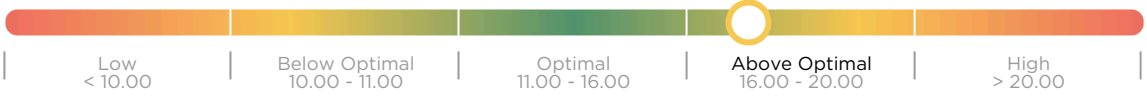
Sodium : Potassium
27.80 ratio



METABOLIC

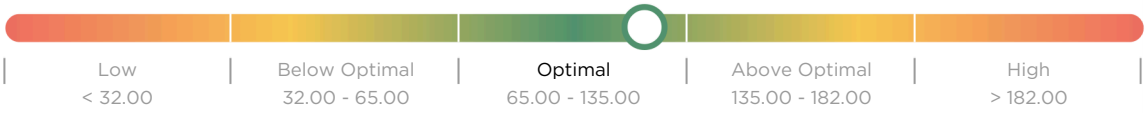
Metabolic biomarkers allow you to evaluate metabolic efficiency, assess tissue breakdown, and identify potential metabolic acidosis or inflammatory states.

Anion Gap
17.00 mEq/L



Uric Acid
4.80 mg/dL

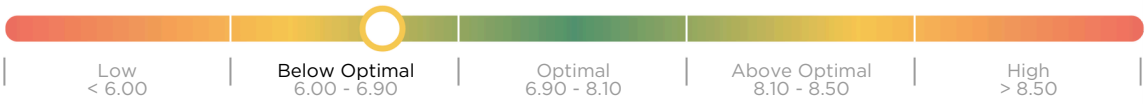
Creatine Kinase (CK)
124.00 U/L



PROTEINS

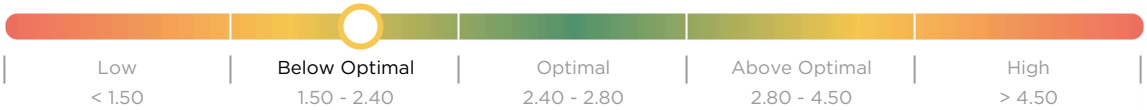
Protein analysis provides essential insights into nutritional status, immune function, and protein synthesis. These markers enable you to evaluate liver function, assess acute and chronic inflammatory states, identify specific immune responses, and monitor nutritional adequacy in you patients.

Protein - Total
6.60 g/dL

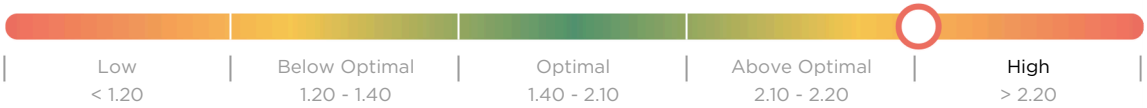


Albumin
4.60 g/dL

Globulin - Total
2.00 g/dL



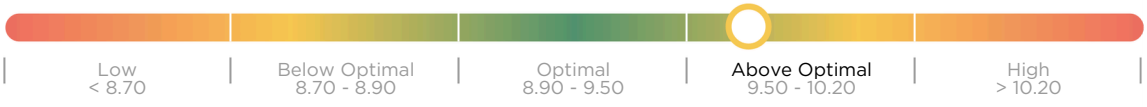
Albumin : Globulin
2.30 ratio



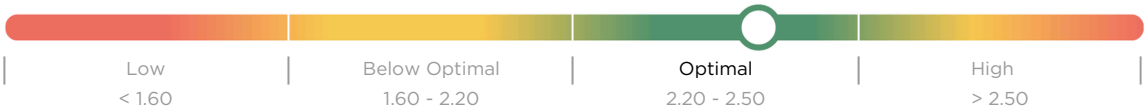
MINERALS

Mineral biomarker analysis provides comprehensive insights into both extracellular and intracellular mineral status, including crucial mineral ratios and interactions. These markers enable you to evaluate mineral balance, assess cellular mineral status, and identify potential mineral interactions that may affect enzymatic function and metabolism.

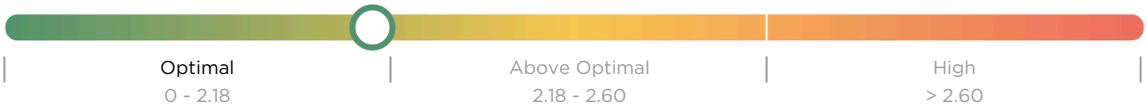
Calcium
9.70 mg/dL



Magnesium - Serum
2.40 mg/dL



Calcium : Albumin
2.11 ratio



LIVER AND GB

Liver and gallbladder biomarkers provide insights into hepatobiliary function, detoxification capacity, and bile acid metabolism. These enzymes and metabolites enable you to evaluate liver cell integrity, cholestasis, biliary function, and potential inflammatory processes, helping you assess both acute and chronic liver stress.

Alk Phos
76.00 IU/L

AST
23.00 IU/L

ALT

24.00 IU/L

Bilirubin - Total

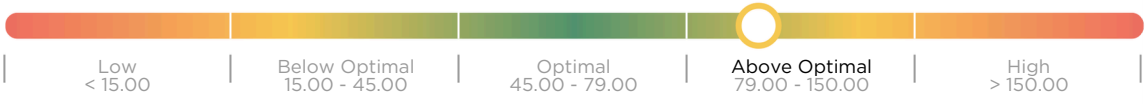
0.40 mg/dL

IRON MARKERS

Iron biomarkers are pivotal for assessing iron homeostasis and its influence on hematological and metabolic processes. Approximately 70% of the body's iron is localized in red blood cells, underscoring iron's critical role in oxygen transport from the lungs to peripheral tissues. Beyond oxygen delivery, iron supports energy release at the cellular level and contributes to immune and neurological functions. Evaluating these markers helps identify potential deficiencies or overload long before overt clinical manifestations arise.

Ferritin

103.00 ng/mL



LIPOPROTEINS

Lipoprotein biomarker analysis provides insights into cardiovascular risk by examining the protein components and structural variations of lipid particles. These markers enable you to evaluate inherited risk factors, assess oxidative damage to lipids, and identify specific atherogenic patterns, allowing you to develop more precise and personalized interventions for your patient.

Apolipoprotein B

97.00 mg/dL

CARDIOMETABOLIC

Cardiometabolic biomarker analysis provides a detailed assessment of cardiovascular and metabolic function. This comprehensive approach aids in the early detection of endothelial dysfunction, subtle myocardial stress, and metabolic irregularities, empowering targeted interventions that address root causes before they evolve into overt clinical conditions.

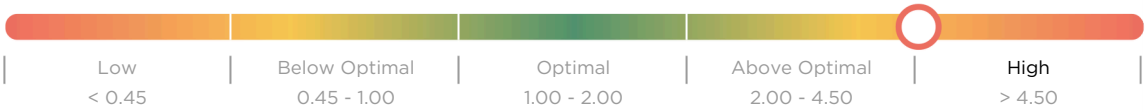
Homocysteine

11.80 µmol/L

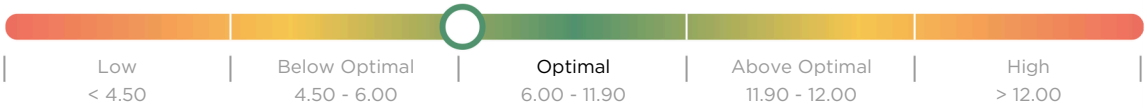
THYROID

Thyroid biomarker analysis provides detailed insights into the complete thyroid axis, including hormone production, conversion, transport, and autoimmune status. These biomarkers enable you to evaluate thyroid function at multiple levels, from pituitary control to cellular hormone availability and antibody presence, helping you identify subtle patterns of dysfunction before the emergence of thyroid pathology.

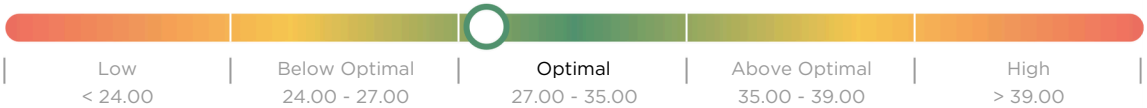
TSH
4.94 mIU/L



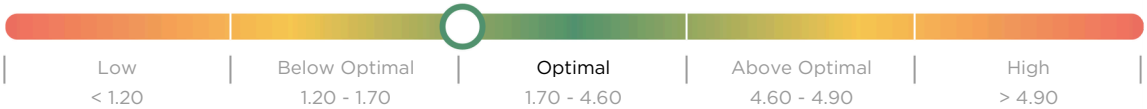
T4 - Total
6.20 µg/dL



T3 Uptake
28.00 %



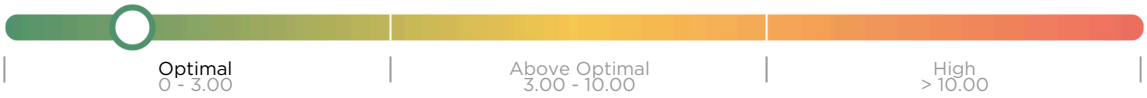
Free Thyroxine Index (T7)
1.73 Index



INFLAMMATION

Inflammatory biomarkers provide data points for evaluating both acute and chronic systemic inflammation, offering insights into cardiovascular risk, autoimmune activity, and overall immune system activation. Beyond standard markers, advanced testing options allow you to assess specific inflammatory pathways, oxidative stress levels, and tissue repair processes, enabling more precise intervention strategies and monitoring of therapeutic effectiveness.

C-Reactive Protein
<1.00 mg/L

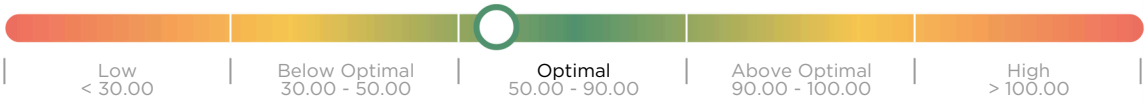


Platelet : Lymphocyte (PLR)
139.47 Ratio

VITAMINS

Vitamin biomarker analysis provides insights into nutrient status through both direct measurement and functional markers of vitamin utilization. These biomarkers enable you to evaluate multiple forms of each vitamin, assess cellular availability, and identify subtle nutrient insufficiencies that may affect metabolic pathways, helping you develop targeted supplementation strategies for your patients.

Vitamin D (25-OH)
57.30 ng/mL



HORMONES

Hormone biomarker analysis provides insights into endocrine function across multiple axes, including reproductive, adrenal, and metabolic pathways. These markers enable you to evaluate complex hormonal relationships and feedback loops, helping you identify subtle imbalances and guide therapeutic interventions.

FSH

Unkn own

41.00 mIU/mL

Follicular	3.50-12.50	Luteal	1.70-7.70
Ovulation	4.70-21.50	Post Menopausal	25.80-134.80

LH

Unknown

18.30 mIU/mL

Follicular	2.40-12.60	Luteal	1.00-11.40
Ovulation	1.70-7.70	Post Menopausal	7.70-58.50

Estradiol

Unknown

<5.00 pg/mL

Follicular	12.50-166.00	Luteal	43.80-211.00
Ovulation	85.80-498.00	Post Menopausal	6.00-27.00

Progesterone

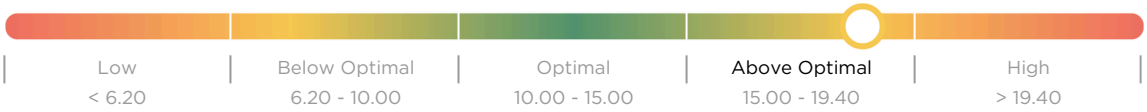
Unknown

0.30 ng/mL

Follicular	0.10-0.90	Luteal	1.80-23.90
Ovulation	0.10-12.00	Post Menopausal	0.00-0.10

Cortisol - Total/AM

18.50 µg/dL

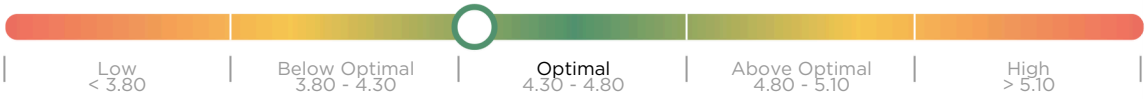


CBC

CBC biomarker analysis provides insights into blood cell composition, morphology, and overall hematopoietic function. These interconnected biomarkers enable you to evaluate oxygen-carrying capacity, detect various types of anemia, assess platelet function, and identify potential bone marrow concerns.

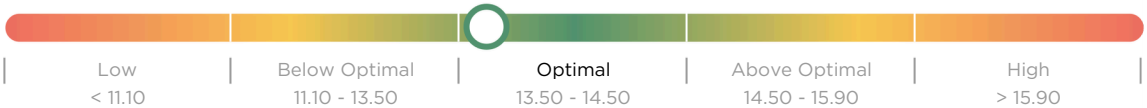
RBC

4.33 m/cumm

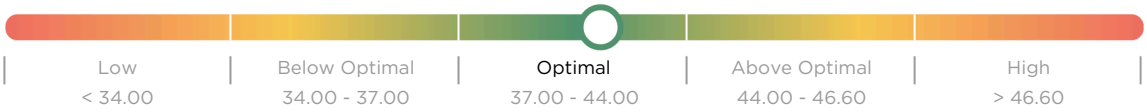


Hemoglobin

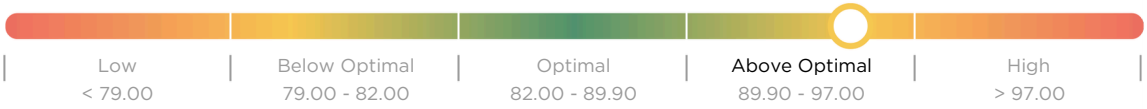
13.60 g/dL



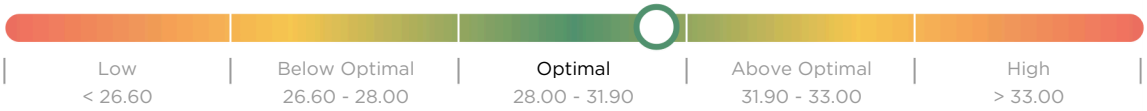
Hematocrit
41.30 %



MCV
95.00 fL

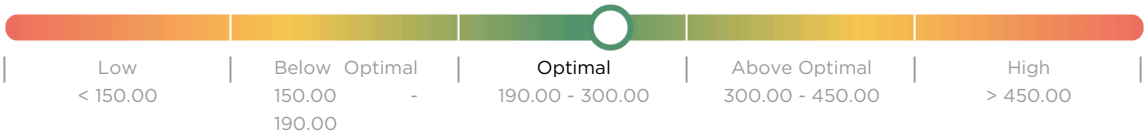


MCH
31.40 pg



MCHC
32.90 g/dL

Platelets
265.00 10E3/uL

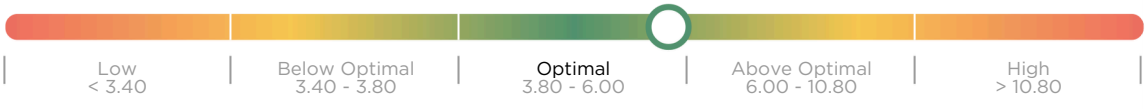


RDW
12.50 %

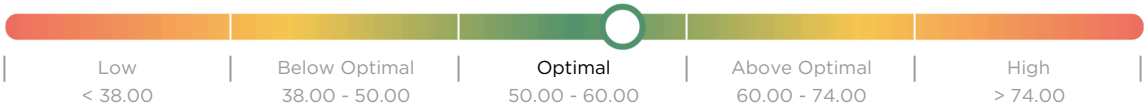
WBCS

White blood cell analysis provides insights into immune system composition and activity through both absolute counts and relative percentages of each cell type. These markers enable you to evaluate immune system balance, assess specific immune responses, and identify patterns of inflammation or infection, helping you develop targeted therapeutic strategies for your patients.

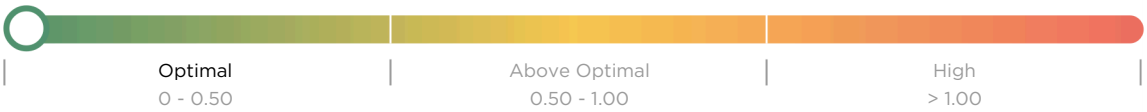
Total WBCs
5.80 k/cumm



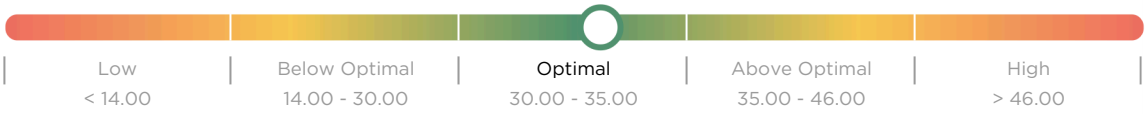
Neutrophils - %
57.00%



Immature Granulocytes - %
0.00 %



Lymphocytes - %
33.00 %



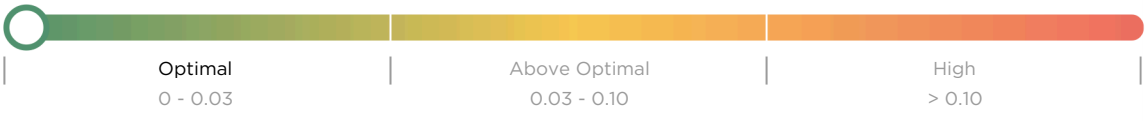
Monocytes - %
8.00 %

Eosinophils - %
1.00 %

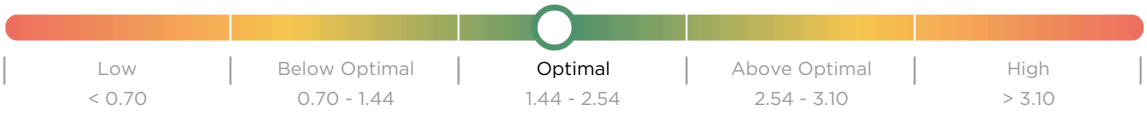
Basophils - %
1.00 %

Neutrophils - Absolute
3.31 k/cumm

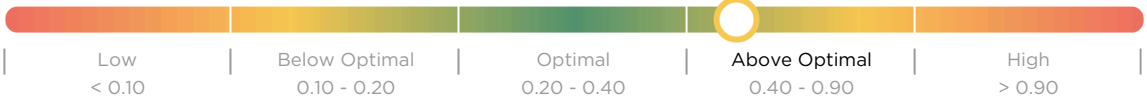
Immature Granulocytes - Absolute
0.00 k/cumm



Lymphocytes - Absolute
1.90 k/cumm



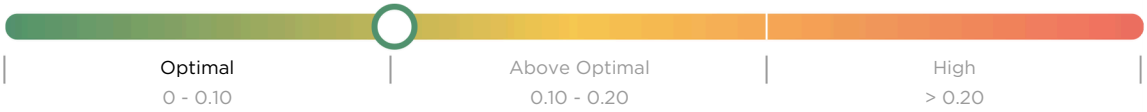
Monocytes - Absolute
0.50 k/cumm



Eosinophils - Absolute
0.10 k/cumm

Basophils - Absolute

0.10 k/cumm



Neutrophil : Lymphocyte

1.74 Ratio

Out of Optimal Range

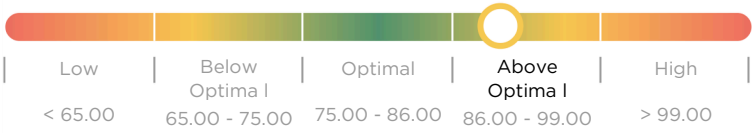
The following report shows all of the biomarkers that are out of the optimal range and gives you some important information as to why each biomarker might be elevated or decreased.

0	1	6	16	4	0
Alarm Low	Low	Below Optimal	Above Optimal	High	Alarm High

BLOOD GLUCOSE

Glucose Fasting

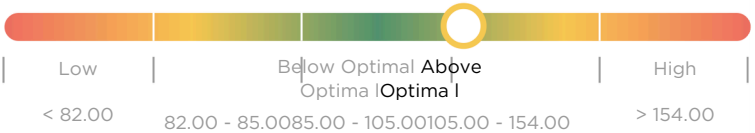
90.00 mg/dL



Fasting blood glucose (FBG) is a critical indicator of metabolic status and reflects the intricate balance of glucose homeostasis, primarily mediated by the hormones insulin and glucagon. Insulin facilitates cellular glucose uptake and inhibits hepatic glucose production, while glucagon promotes glycogenolysis and gluconeogenesis in the liver. Elevated FBG levels are typically indicative of disrupted insulin activity or insufficient insulin secretion, commonly seen in conditions such as type 1 diabetes mellitus, where pancreatic beta-cell destruction leads to severe insulin deficiency, and type 2 diabetes mellitus, characterized by insulin resistance and eventual pancreatic beta-cell exhaustion. Additionally, increased FBG can signal underlying metabolic syndrome or prediabetic states, suggesting a broader spectrum of insulin resistance encompassing impaired glucose tolerance and altered lipid metabolism.

eAG

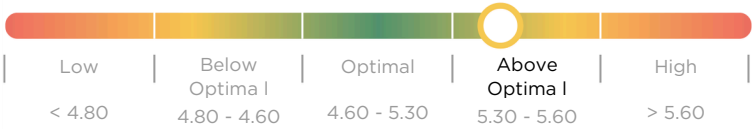
108.28 mg/dL



Estimated Average Glucose (eAG) provides a long-term view of a patient's average blood glucose, calculated from hemoglobin A1C. A higher eAG suggests elevated blood glucose levels over a 2- to 3-month span and correlates with an increased hemoglobin A1C. You should be aware that this can signal trends toward prediabetes, metabolic syndrome, insulin resistance, or overt diabetes. Patients with high eAG values often benefit from lifestyle interventions—such as dietary modifications, increased physical activity, and weight management—or pharmacologic therapy if warranted. Monitoring other relevant biomarkers (e.g., fasting glucose, insulin, lipid panel) can further clarify the extent of dysglycemia and guide an appropriate treatment plan.

Hemoglobin A1C

5.40 %

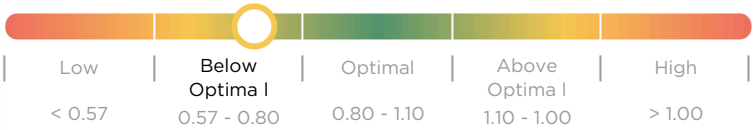


Hemoglobin A1C (HgbA1C) measures the percentage of hemoglobin bonded to glucose over the roughly 120-day lifespan of a red blood cell. When HgbA1C is high, this indicates elevated blood glucose levels over the past three to four months, suggesting suboptimal glycemic control. This finding can point to insulin resistance, prediabetes, or diabetes mellitus, and it correlates with a higher risk of diabetes-related complications. Implementing appropriate interventions—such as optimizing dietary patterns, increasing physical activity, or adjusting pharmacotherapy—can help bring HgbA1C closer to target ranges and reduce long-term health risks.

RENAL

Creatinine

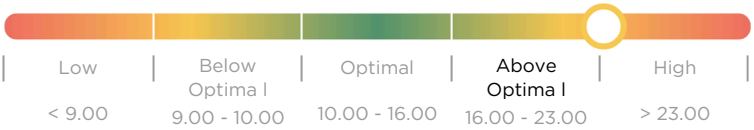
0.73 mg/dL



Serum creatinine reflects the end product of muscle metabolism, cleared by the kidneys. Low serum creatinine can result from reduced muscle mass or conditions associated with muscle wasting. While low creatinine typically does not indicate kidney dysfunction, correlating these findings with patient history, body composition, and other renal parameters can help differentiate normal variation from possible underlying pathologies such as malnutrition or sarcopenia.

BUN : Creatinine

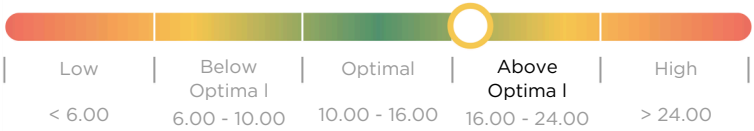
23.00 Ratio



The BUN:Creatinine ratio compares blood urea nitrogen (BUN) to serum creatinine, providing insights into protein metabolism and renal function. When the ratio is high, it often indicates prerenal azotemia resulting from reduced renal perfusion (e.g., dehydration, heart failure). Alternatively, it may reflect increased protein catabolism (e.g., high-protein diets) or other factors elevating BUN more than creatinine. Evaluating fluid status, dietary habits, and concurrent laboratory values—such as electrolytes or liver enzymes—helps clarify the underlying cause and guides appropriate management.

BUN

17.00 mg/dL

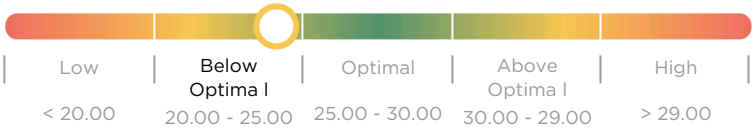


Blood Urea Nitrogen (BUN) is a key biochemical marker reflecting protein metabolism and renal function. Urea, the primary component measured by BUN tests, is formed in the liver as an end product of protein degradation and is subsequently excreted by the kidneys. Elevated BUN levels can indicate renal impairment, where decreased kidney function leads to reduced urea clearance. This elevation may also occur in conditions such as dehydration, which reduces renal blood flow and thus urea excretion, or in states of increased protein catabolism, such as gastrointestinal bleeding, high protein diets, or severe infections. Monitoring BUN levels provides crucial insights into renal health and the body's protein metabolism state. It aids in diagnosing kidney diseases, assessing the impact of certain drugs on renal function, and evaluating the nutritional status of patients, particularly in the context of critical illness or chronic liver disease.

ELECTROLYTES

CO2

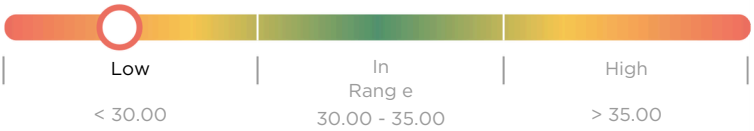
24.00 mEq/L



Serum CO_2, measured chiefly as bicarbonate, is crucial for buffering acids in the body and maintaining acid-base balance. When serum CO_2 is low, it commonly correlates with metabolic acidosis or other processes that deplete bicarbonate (e.g., ketoacidosis, lactic acidosis, or renal tubular acidosis). Evaluating blood pH, anion gap, and other relevant labs (e.g., lactate, renal function tests) can help pinpoint the specific etiology and guide appropriate interventions to address the underlying acid-base disturbance.

Sodium : Potassium

27.80 ratio

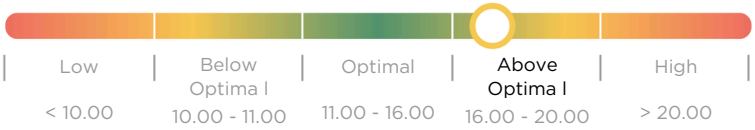


The sodium:potassium ratio compares two key electrolytes primarily regulated by the adrenal hormones aldosterone and cortisol. A low ratio reflects chronic stress or diminished adrenal function, often termed “adrenal fatigue” or insufficiency. Low aldosterone leads to sodium loss and potassium retention, lowering the ratio. Elevated cortisol relative to aldosterone output can also drive a catabolic state, indicating possible tissue breakdown and impaired regenerative capacity. Evaluating additional adrenal markers and clinical contexts—such as symptoms of fatigue, hypotension, or lab findings for inflammation—helps confirm and address this chronic stress pattern.

METABOLIC

Anion Gap

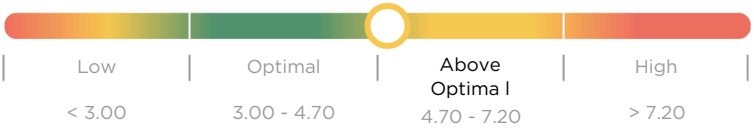
17.00 mEq/L



The Anion Gap is calculated by the formula (Na + K) − (CO_2 + Cl), offering an estimate of unmeasured ions in the blood. A high Anion Gap typically indicates a net accumulation of acids, as seen in metabolic acidosis. Conditions like diabetic ketoacidosis, lactic acidosis, and renal failure often present with a concurrent low CO_2 and elevated chloride, further confirming an acid-base disturbance. Evaluating blood pH, lactate levels, renal function, and clinical context is crucial for pinpointing the underlying etiology and guiding appropriate treatment.

Uric Acid

4.80 mg/dL

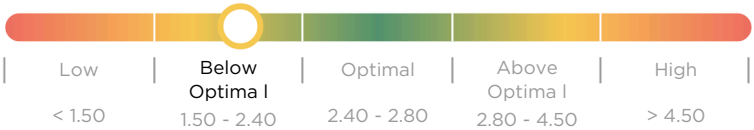


Uric acid is the end-product of purine, nucleic acid, and nucleoprotein metabolism, offering insight into oxidative balance and inflammation. Elevated uric acid can be associated with gout, increased inflammation, oxidative stress, renal dysfunction, and cardiovascular risk factors. Heightened levels may also suggest impaired excretion or excessive production due to intestinal hyperpermeability, chronic inflammatory states, or dietary factors high in purines. Evaluating patterns in lipid profiles, renal markers (BUN/creatinine), and inflammatory markers can clarify whether the elevation signifies gout, cardiovascular disease risk, rheumatoid arthritis, or other systemic conditions.

PROTEINS

Globulin - Total

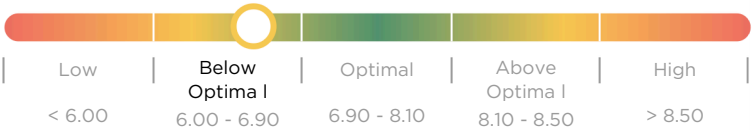
2.00 g/dL



Total globulin represents the sum of immunoglobulins (antibodies) and other globular proteins involved in immune defense, inflammatory processes, and transport functions. A low total globulin can suggest immunodeficiency, malnutrition, or certain gastrointestinal conditions that impair protein absorption. Additionally, chronic inflammation in the digestive tract can sometimes deplete globulin levels. Assessing immunoglobulin subsets, liver enzymes, and nutritional status helps determine whether the low globulin is due to immune insufficiency, reduced protein intake, or malabsorption issues.

Protein - Total

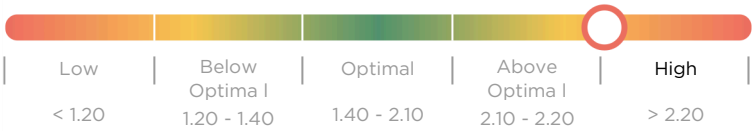
6.60 g/dL



Serum total protein is composed of albumin and total globulins, reflecting both nutritional status and hepatic protein synthesis. Low total protein levels often suggest malnutrition, hypochlorhydria (leading to decreased protein digestion), or liver dysfunction that impairs protein production. Evaluating albumin, globulin fractions, and related markers (e.g., liver enzymes, RBC indices) can help distinguish between inadequate amino acid intake, reduced digestive capacity, or compromised hepatic function.

Albumin : Globulin

2.30 ratio

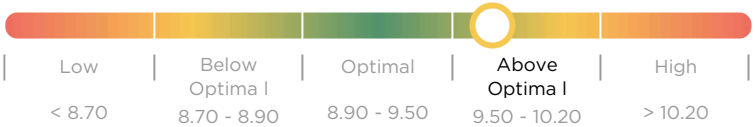


The albumin:globulin (A:G) ratio compares the liver-derived protein albumin to total globulins, which include immunoglobulins and other proteins associated with immune response and inflammation. A high A:G ratio often reflects relatively reduced globulin levels or disproportionately high albumin. This can occur in situations of immunodeficiency, hypogammaglobulinemia, or hemoconcentration (dehydration). Reviewing immune markers, assessing hydration status, and correlating with other nutritional or hepatic indicators can clarify whether the ratio's elevation stems from a genuine drop in globulins or an increase in albumin concentration.

MINERALS

Calcium

9.70 mg/dL

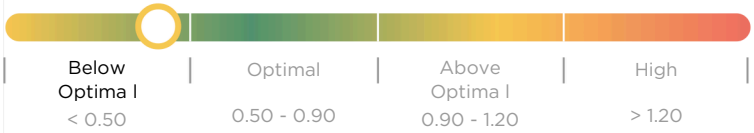


Serum calcium levels, which are tightly regulated within a narrow range, are principally regulated by parathyroid hormone (PTH) and vitamin D. Elevated calcium is associated with parathyroid hyperfunction. If significantly elevated (>10.6 mg/dl or 2.65 mmol/L) check serum PTH levels and refer to an endocrinologist.

LIVER AND GB

Bilirubin - Total

0.40 mg/dL

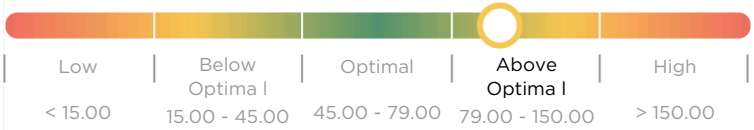


Total bilirubin is composed of two forms of bilirubin: Indirect or unconjugated bilirubin, which circulates in the blood on its way to the liver, and direct or conjugated bilirubin, which is the form of bilirubin made water-soluble before it is excreted in the bile. A decreased bilirubin has been associated with a trend toward oxidative stress and/or systemic inflammation, potentially compromising cardiovascular health.

IRON MARKERS

Ferritin

103.00 ng/mL

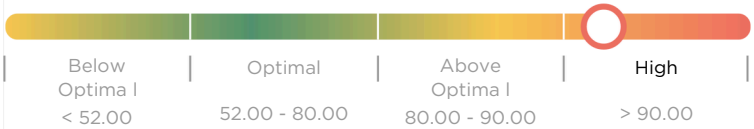


Ferritin is the main storage form of iron in the body. Increased levels are associated with iron overload, an increasing risk of cardiovascular disease, inflammation and oxidative stress.

LIPOPROTEINS

Apolipoprotein B

97.00 mg/dL

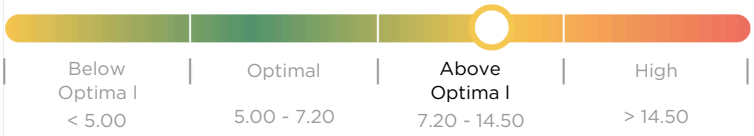


Apolipoprotein B (also called Apolipoprotein B-100) is a protein constituent of lipoproteins such as VLDL and LDL. Increased levels of Apo B are associated with an increased risk of cardiovascular disease.

CARDIOMETABOLIC

Homocysteine

11.80 µmol/L

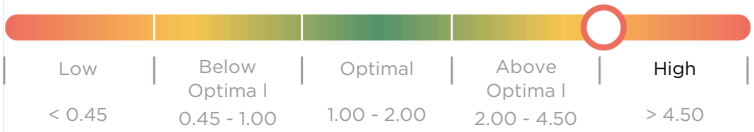


Homocysteine is a molecule formed from the incomplete metabolism of the amino acid methionine. Increased levels of homocysteine are associated with an increased risk of cardiovascular disease and stroke.

THYROID

TSH

4.94 mIU/L

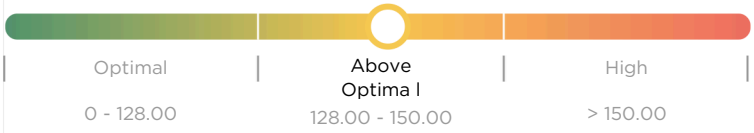


TSH or thyroid-stimulating hormone is a hormone produced by the anterior pituitary to control the thyroid gland's production of the thyroid hormone thyroxine (T4). TSH levels can be confusing because TSH levels increase when there is too little thyroid hormone in circulation. An elevated TSH is a sign that the body needs more thyroid hormone. Elevated levels of TSH are associated with primary hypothyroidism.

INFLAMMATION

Platelet : Lymphocyte (PLR)

139.47 Ratio

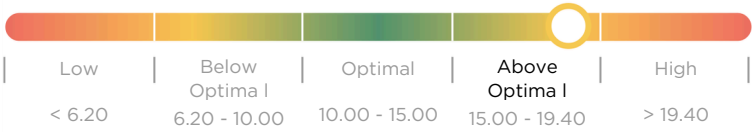


The Platelet-Lymphocyte Ratio, or PLR for short, is a way to look at your blood to get clues about inflammation and clotting in your body. If the PLR is higher than what's typical, it might mean there's more inflammation in your body. This can be linked to various health problems, including issues with the heart and circulation.

HORMONES

Cortisol - Total/AM

18.50 µg/dL

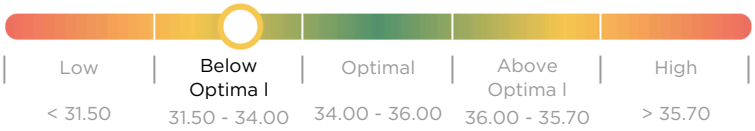


The serum cortisol test is used to identify dysfunction in the adrenal gland. Increased levels are associated with adrenal hyperfunction, a dysfunction where the adrenal glands are producing too much cortisol.

CBC

MCHC

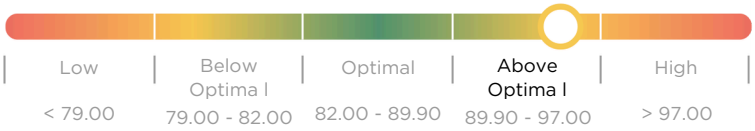
32.90 g/dL



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.

MCV

95.00 fL



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.

WBCS

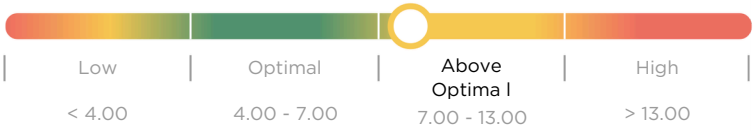
Monocytes - Absolute

0.50 k/cumm

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.

Monocytes - %

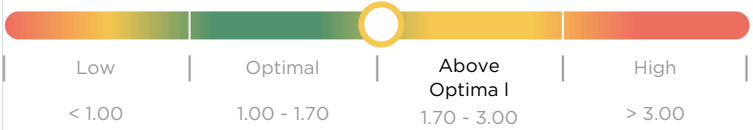
8.00 %



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.

Neutrophil : Lymphocyte

1.74 Ratio

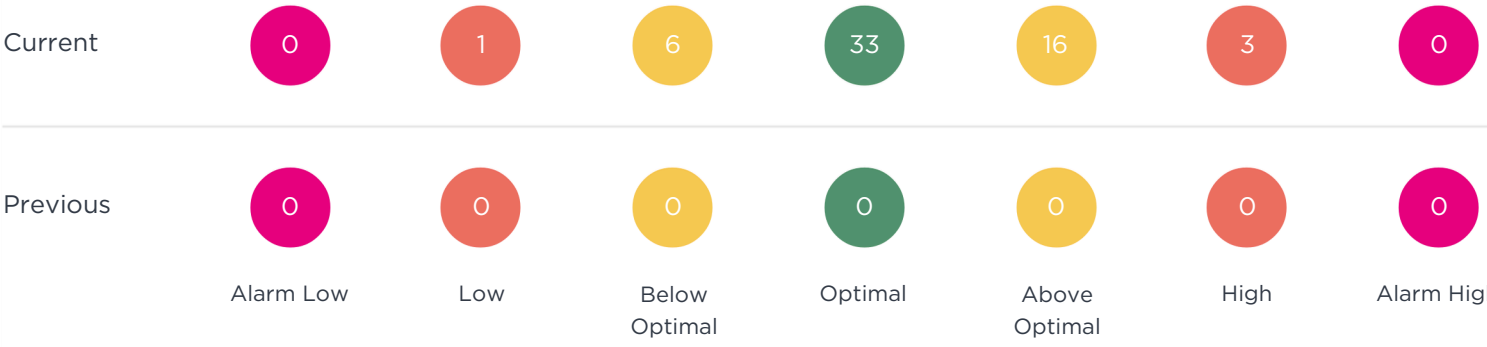


The neutrophil-lymphocyte ratio (NLR) reflects important components of the cell-mediated inflammatory response, i.e. neutrophils and lymphocytes. Elevated levels are seen in bacterial infections and are considered a marker of systemic inflammation and metabolic dysfunction such as metabolic syndrome and thyroid dysfunction.

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 optimal, outside of the optimal range, or outside of the standard range.

A comparison of the total number of biomarkers by optimal range



Biomarker	Lab Corp			
	Current May 16 2 025	Optimal Range	Standard Range	Units
BLOOD GLUCOSE				
Glucose Fasting	90.00	75.00 - 86.00	65.00 - 99.00	mg/dL
Hemoglobin A1C	5.40	4.60 - 5.30	4.80 - 5.60	%
eAG	108.28	85.00 - 105.00	82.00 - 154.00	mg/dL
RENAL				
BUN				
Creatinine	17.00	10.00 - 16.00	6.00 - 24.00	mg/dL
BUN : Creatinine	0.73	0.80 - 1.10	0.57 - 1.00	mg/dL
	23.00	10.00 - 16.00	9.00 - 23.00	Ratio
eGFR	101.00	90.00 - 120.00	60.00 - 160.00	mL/mi
ELECTROLYTES				n
Sodium				
Potassium	139.00	137.00 - 142.00	134.00 -	mEq/L
Chloride	5.00	4.00 - 5.00	144.00 3.50 -	mEq/L
CO2	103.00	100.00 - 106.00	5.20 96.00 -	mEq/L
Sodium : Potassium	24.00	25.00 - 30.00	106.00 20.00 -	mEq/L
	27.80		29.00 30.00 -	ratio
			35.00	

Biomarker	Lab Corp			
	Current May 16 2 025	Optimal Range	Standard Range	Units
METABOLIC				
Anion Gap	17.00	11.00 - 16.00	10.00 - 20.00	mEq/L
Uric Acid	4.80	3.00 - 4.70	3.00 - 7.20	mg/dL
Creatine Kinase (CK)	124.00	65.00 - 135.00	32.00 - 182.00	U/L
PROTEINS				
Protein - Total	6.60	6.90 - 8.10	6.00 - 8.50	g/dL
Albumin	4.60	4.50 - 5.00	3.80 - 4.90	g/dL
Globulin - Total	2.00	2.40 - 2.80	1.50 - 4.50	g/dL
Albumin : Globulin	2.30	1.40 - 2.10	1.20 - 2.20	ratio
MINERALS				
Calcium	9.70	8.90 - 9.50	8.70 - 10.20	mg/d
Magnesium - Serum	2.40	2.20 - 2.50	1.60 - 2.30	L
Calcium : Albumin	2.11	0 - 2.18	0 - 2.60	mg/d
LIVER AND GB				L ratio
Alk Phos	76.00	45.00 -	44.00 - 121.00	IU/L
AST ALT	23.00	100.00 10.00 -	0.00 - 40.00	IU/L
Bilirubin -	24.00	26.00 10.00 -	0.00 - 32.00	IU/L
Total	0.40	26.00 0.50 -	0.00 - 1.20	mg/d
IRON MARKERS		0.90		L
Ferritin	103.00	45.00 - 79.00	15.00 - 150.00	ng/mL
LIPOPROTEINS				
Apolipoprotein B	97.00	52.00 - 80.00	0.00 - 90.00	mg/dL
CARDIOMETABOLIC				
Homocysteine	11.80	5.00 - 7.20	0 - 14.50	µmol/L
THYROID				
TSH	4.94	1.00 - 2.00	0.45 - 4.50	mIU/L
T4 - Total	6.20	6.00 - 11.90	4.50 - 12.00	µg/dL
T3 Uptake	28.00	27.00 - 35.00	24.00 - 39.00	%
Free Thyroxine Index (T7)	1.73	1.70 - 4.60	1.20 - 4.90	Index
INFLAMMATION				
C-Reactive Protein	<1.00	0 - 3.00	0 - 10.00	mg/L
Platelet : Lymphocyte (PLR)	139.47	0 - 128.00	0 - 150.00	Ratio
VITAMINS				
Vitamin D (25-OH)	57.30	50.00 - 90.00	30.00 - 100.00	ng/mL
HORMONES				

Biomarker	Lab Corp			
	Current May 16 2 025	Optimal Range	Standard Range	Units
FSH	41.00 *UNKNOWN*	Follicular Luteal Ovulat ion Post Meno pausal	3.50 - 12.50 1.70 - 7.70 4.70 - 21.5 0 25.80 - 134.8 0	mIU/mL
LH	18.30 *UNKNOWN*	Follicular Luteal Ovulat ion Post Meno pausal	2.40 - 12.60 1.00 - 11.40 1.70 - 7.70 7.70 - 58.5 0	mIU/mL
Estradiol	<5.00 *UNKNOWN*	Follicular Luteal Ovulat ion Post Meno pausal	12.50 - 166.00 43.80 - 211.00 85.80 - 498.00 6.00 - 27.00	pg/mL
Progesterone	0.30 *UNKNOWN*	Follicular Luteal Ovulat ion Post Meno pausal	0.10 - 0.90 1.80 - 23.90 0.10 - 12.00 0.00 - 0.10	ng/mL
Cortisol - Total/AM	18.50	10.00 - 15.00	6.20 - 19.40	µg/dL
CBC				
RBC	4.33	4.30 - 4.80	3.80 - 5.10	m/cumm
Hemoglobin	13.60	13.50 - 14.50	11.10 - 15.90	g/dL
Hematocrit	41.30	37.00 - 44.00	34.00 - 46.60	%
MCV	95.00	82.00 - 89.90	79.00 - 97.00	fL
MCH	31.40	28.00 - 31.90	26.60 - 33.00	pg
MCHC	32.90	34.00 - 36.00	31.50 - 35.70	g/dL
Platelets	265.00	190.00 -	150.00 - 450.00	10E3/uL
RDW	12.50	300.00 11.00 - 12.60	11.60 - 15.40	%
WBCS Total WBCs				
Neutrophils - %	5.80	3.80 - 6.00	3.40 - 10.80	k/cum
Immature Granulocytes - %	57.00	50.00 -	38.00 - 74.00	m % %
Lymphocytes - %	0.00	60.00 0 -	0 - 1.00	% % %
Monocytes - %	33.00	0.50 30.00 -	14.00 - 46.00	%
Eosinophils - %	8.00	35.00 4.00 -	4.00 - 13.00	k/cum
Basophils - %	1.00	7.00	0 - 3.00	m
Neutrophils - Absolute	1.00		0 - 1.00	k/cum
Immature Granulocytes - Absolute	3.31	1.90 - 4.20	1.40 - 7.00	m
	0.00	0 - 0.03	0 - 0.10	k/cum
Lymphocytes - Absolute	1.90	1.44 - 2.54	0.70 - 3.10	m
Monocytes - Absolute	0.50	0.20 - 0.40	0.10 - 0.90	k/cum
Eosinophils - Absolute	0.10	0.03 - 0.20	0 - 0.40	m
Basophils - Absolute	0.10	0 - 0.10	0 - 0.20	k/cum
Neutrophil : Lymphocyte	1.74	1.00 - 1.70	1.00 - 3.00	m k/cum m 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
TSH	4.94	1.00	2.00	344	
Homocysteine	11.80	5.00	7.20	259	
BUN : Creatinine	23.00	10.00	16.00	167	
Ferritin	103.00	45.00	79.00	121	
Cortisol - Total/AM	18.50	10.00	15.00	120	
MCV	95.00	82.00	89.90	115	
Apolipoprotein B	97.00	52.00	80.00	111	
Monocytes - Absolute	0.50	0.20	0.40	100	
Glucose Fasting	90.00	75.00	86.00	86	
Calcium	9.70	8.90	9.50	83	
Monocytes - %	8.00	4.00	7.00	83	
Albumin : Globulin	2.30	1.40	2.10	79	
Anion Gap	17.00	11.00	16.00	70	
BUN	17.00	10.00	16.00	67	
eAG	108.28	85.00	105.00	66	
Hemoglobin A1C	5.40	4.60	5.30	64	
Platelet : Lymphocyte (PLR)	139.47	0	128.00	59	
Uric Acid	4.80	3.00	4.70	56	
Neutrophil : Lymphocyte	1.74	1.00	1.70	56	
Potassium	5.00	4.00	5.00	50	
Basophils - %	1.00	0	1.00	50	
Basophils - Absolute	0.10	0	0.10	50	
Calcium : Albumin	2.11	0	2.18	47	
RDW	12.50	11.00	12.60	44	
Total WBCs	5.80	3.80	6.00	41	
ALT	24.00	10.00	26.00	38	
MCH	31.40	28.00	31.90	37	
Creatine Kinase (CK)	124.00	65.00	135.00	34	
AST	23.00	10.00	26.00	31	
Neutrophils - %	57.00	50.00	60.00	20	
Platelets	265.00	190.00	300.00	18	
Magnesium - Serum	2.40	2.20	2.50	17	

Biomarker	Lab Result	Optimal Range		% Deviation	Optimal Range
		Low	High		Low High
Hematocrit	41.30	37.00	44.00	11	
Neutrophils - Absolute	3.31	1.90	4.20	11	
Lymphocytes - %	33.00	30.00	35.00	10	
Alk Phos	76.00	45.00	100.00	6	
Chloride	103.00	100.00	106.00	0	
Lymphocytes - Absolute	1.90	1.44	2.54	-8	
Eosinophils - Absolute	0.10	0.03	0.20	-9	
Sodium	139.00	137.00	142.00	-10	
eGFR	101.00	90.00	120.00	-13	
Eosinophils - %	1.00	0	3.00	-17	
C-Reactive Protein	<1.00	0	3.00	-17	
Albumin	4.60	4.50	5.00	-30	
Vitamin D (25-OH)	57.30	50.00	90.00	-32	
T3 Uptake	28.00	27.00	35.00	-38	
Hemoglobin	13.60	13.50	14.50	-40	
RBC	4.33	4.30	4.80	-44	
T4 - Total	6.20	6.00	11.90	-47	
Free Thyroxine Index (T7)	1.73	1.70	4.60	-49	
Immature Granulocytes - %	0.00	0	0.50	-50	
Immature Granulocytes - Absolute	0.00	0	0.03	-50	
CO2	24.00	25.00	30.00	-70	
Creatinine	0.73	0.80	1.10	-73	
Protein - Total	6.60	6.90	8.10	-75	
Bilirubin - Total	0.40	0.50	0.90	-75	
Sodium : Potassium	27.80	30.00	35.00	-94	
MCHC	32.90	34.00	36.00	-105	
Globulin - Total	2.00	2.40	2.80	-150	

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
- High/ Low
- Alarm High / Alarm Low

Biomarker		Latest Test Result Lab Corp May 16 2025
BLOOD GLUCOSE		
Glucose Fasting		90.00
Hemoglobin A1C		5.40
eAG		108.28
RENAL		
BUN		17.00
Creatinine		0.73
BUN : Creatinine		23.00
eGFR		101.00
ELECTROLYTES		
Sodium		139.00
Potassium		5.00
Chloride		103.00
CO2		24.00
Sodium : Potassium		27.80
METABOLIC		
Anion Gap		17.00
Uric Acid		4.80

Biomarker	Latest Test Result Lab Corp May 16 2025
Creatine Kinase (CK)	124.00
PROTEINS	
Protein - Total	6.60
Albumin	4.60
Globulin - Total	2.00
Albumin : Globulin	2.30
MINERALS	
Calcium	9.70
Magnesium - Serum	2.40
Calcium : Albumin	2.11
LIVER AND GB	
Alk Phos	76.00
AST	23.00
ALT	24.00
Bilirubin - Total	0.40
IRON MARKERS	
Ferritin	103.00
LIPOPROTEINS	
Apolipoprotein B	97.00
CARDIOMETABOLIC	
Homocysteine	11.80
THYROID	
TSH	4.94
T4 - Total	6.20
T3 Uptake	28.00

Biomarker	Latest Test Result Lab Corp May 16 2025
Free Thyroxine Index (T7)	1.73
INFLAMMATION	
C-Reactive Protein	<1.00
Platelet : Lymphocyte (PLR)	139.47
VITAMINS	
Vitamin D (25-OH)	57.30
HORMONES	
FSH	41.00 *UNKNOWN*
LH	18.30 *UNKNOWN*
Estradiol	<5.00 *UNKNOWN*
Progesterone	0.30 *UNKNOWN*
Cortisol - Total/AM	18.50
CBC	
RBC	4.33
Hemoglobin	13.60
Hematocrit	41.30
MCV	95.00
MCH	31.40
MCHC	32.90
Platelets	265.00
RDW	12.50
WBCS	
Total WBCs	5.80
Neutrophils - %	57.00
Immature Granulocytes - %	0.00

Biomarker	Latest Test Result Lab Corp May 16 2025
Lymphocytes - %	33.00
Monocytes - %	8.00
Eosinophils - %	1.00
Basophils - %	1.00
Neutrophils - Absolute	3.31
Immature Granulocytes - Absolute	0.00
	1.90
Lymphocytes - Absolute	
Monocytes - Absolute	0.50
Eosinophils - Absolute	0.10
Basophils - Absolute	0.10
Neutrophil : Lymphocyte	1.74

3

An in-depth functional system and nutrient evaluation.

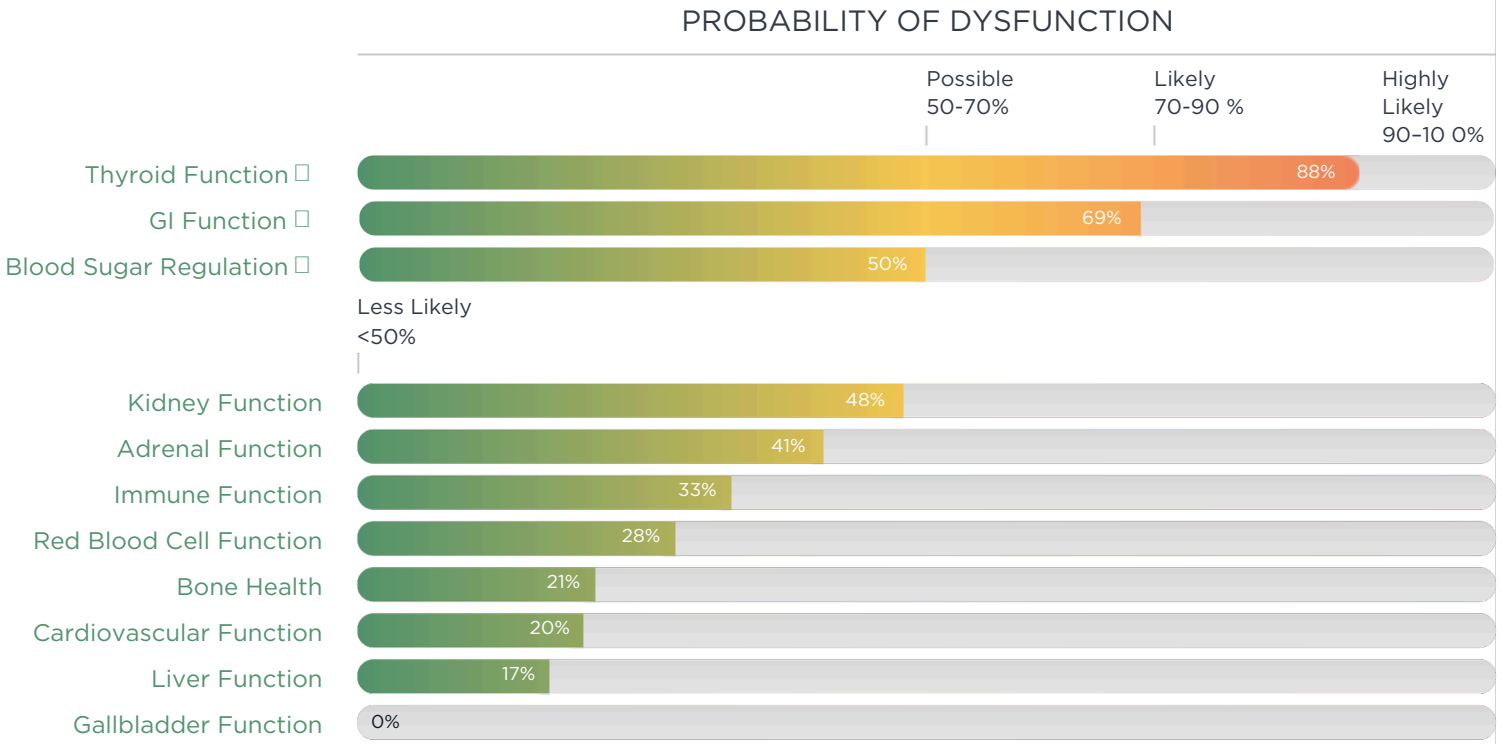
Assessment

Functional Body Systems

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

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

Please use this report in conjunction with the "Practitioner's Only Clinical Dysfunctions Report" to identify which dysfunctions and conditions are causing changes in the Functional Body Systems.
Each Body System that has a probability of dysfunction above 50% is included in the section that follows so you can read a detailed description and individual explanation of the results shown in this report.



Functional Body Systems Details

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

Dysfunction Likely
Improvement require d.

THYROID FUNCTION □

It is likely that your patient is trending towards thyroid dysfunction. This could be emerging hyperactive thyroid, hypothyroidism, anterior pituitary dysfunction, or thyroid conversion syndrome. Please refer to the "Clinical Dysfunctions" report to get a sense of the probability of dysfunction in these "conditions".

Rationale
TSH □

Biomarkers considered
TSH, T4 - Total, T3 Uptake, Free Thyroxine Index (T7)

Biomarkers not available in this test - consider running in future tests:
T4 - Free, T3 - Total, T3 - Free, Reverse T3, Free T3 : Reverse T3

Dysfunction Possible
There may be improvement needed in certain areas.

GI FUNCTION □

It is possible that your patient is in the early stages of inflammation of the gastric mucosa, H. pylori, pancreatic insufficiency, dysbiosis, or intestinal hyperpermeability, which is causing an increase in their GI Function score. While this may not require immediate attention, you may want to keep an eye on this on future blood tests.

Rationale
BUN □ , Protein - Total□ , Globulin - Total□ , MCV □ , Creatinine □

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

Biomarkers not available in this test - consider running in future tests:
Phosphorus, Iron - Serum, Gastrin

Dysfunction Possible
There may be improvement needed in certain areas.

BLOOD SUGAR REGULATION

It is possible that your patient is in the early stages of hypoglycemia, dysglycemia, metabolic syndrome, or insulin resistance, which is causing an increase in their Blood Sugar Regulation score. While this may not require immediate attention, you may want to keep an eye on this on future blood tests.

Rationale
Glucose Fasting , Hemoglobin A1C

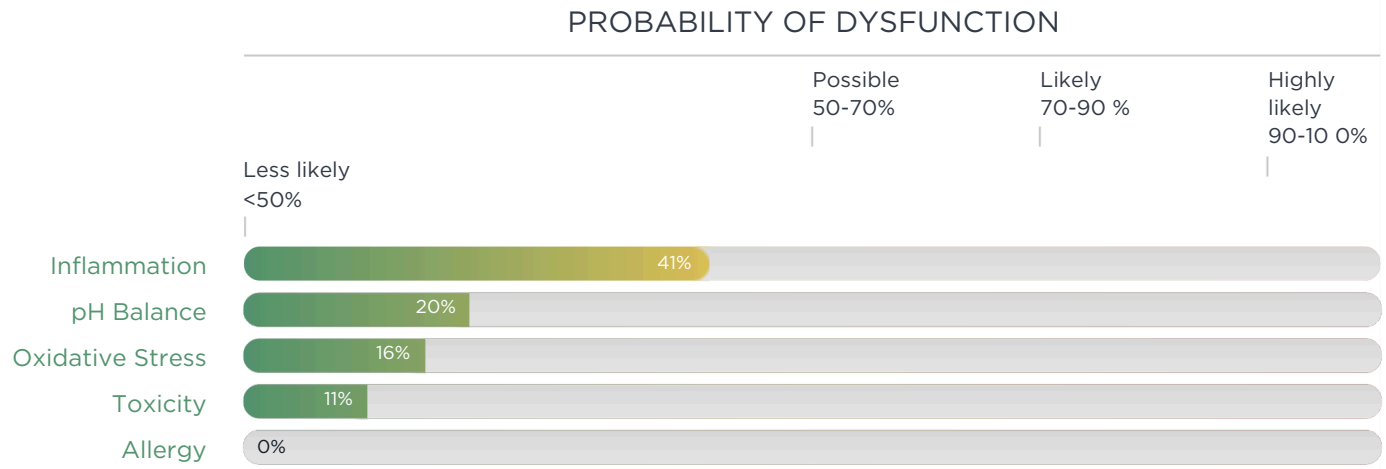
Biomarkers considered
Glucose Fasting, Hemoglobin A1C

Biomarkers not available in this test - consider running in future tests:
HOMA2-IR, LDH, Cholesterol - Total, Triglycerides, HDL Cholesterol, Insulin - Fasting, C-Peptide, LDL Cholesterol, DHEA-S, Fructosamine

Accessory Systems

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

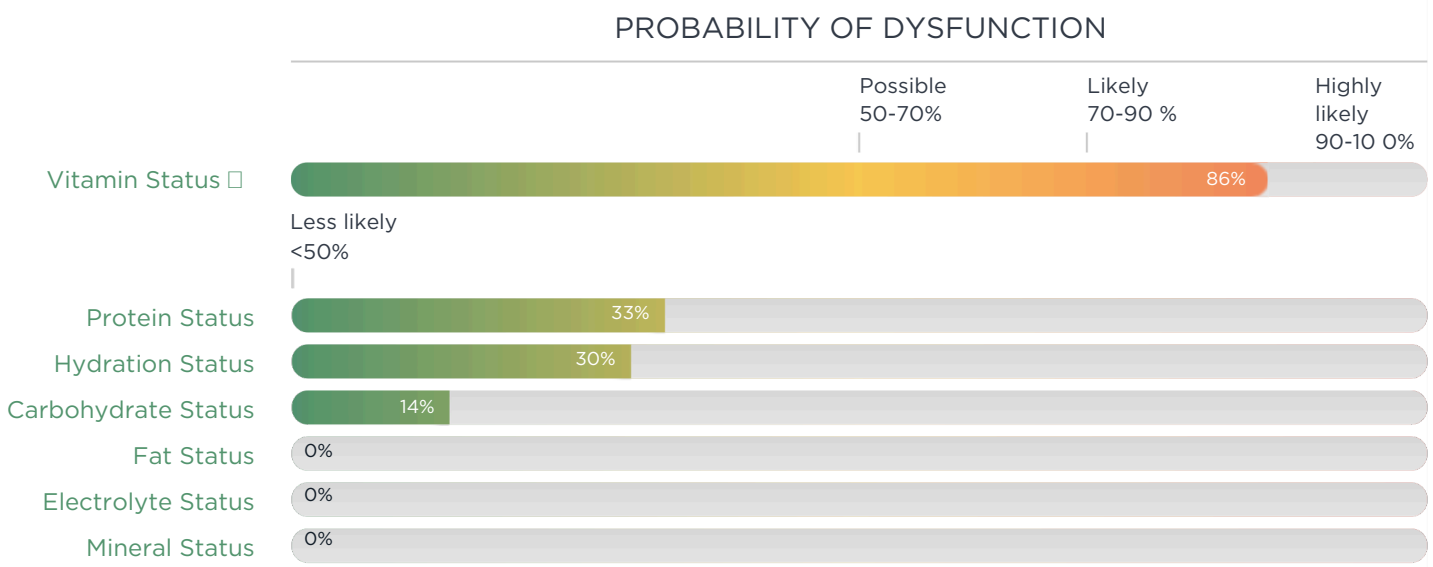
The Accessory Systems Report represents an algorithmic analysis of this blood test. These results have been converted into an individualized risk evaluation based on the latest research.
Each Accessory System that has a probability of dysfunction above 50% is included in the section that follows so you can read a detailed description and individual explanation of the results shown in this report.



Nutrient Status

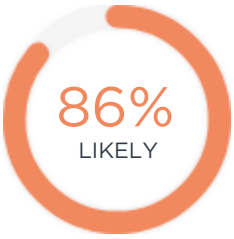
The Nutrient Status results represent an algorithmic analysis of this blood test. These results have been converted into your patient's individual Nutrient Status Report based on our latest research.

This report gives you an indication of your patient's general nutritional status. The Nutrient Status is influenced by actual dietary intake, digestion, absorption, assimilation, and cellular uptake of the nutrients themselves.
Each Nutrient category that has a probability of dysfunction above 50% is included in the section that follows so you can read a detailed description and individual explanation of the results shown in this report.



Nutrient Status Details

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



Dysfunction Likely.
Improvement require d.

VITAMIN STATUS

Your patient is likely trending towards a vitamin deficiency or need, causing an increase in their Vitamin Status score. This could be caused by emerging vitamin deficiencies or needs such as vitamin B12, vitamin B6, folate, thiamin, vitamin D, and vitamin C. Please refer to the "Nutrient Deficiency" report to get a sense of the probability of deficiency in these vitamins.

Rationale

Homocysteine , MCV

Biomarkers considered

Albumin, AST, ALT, Homocysteine, Vitamin D (25-OH), MCV

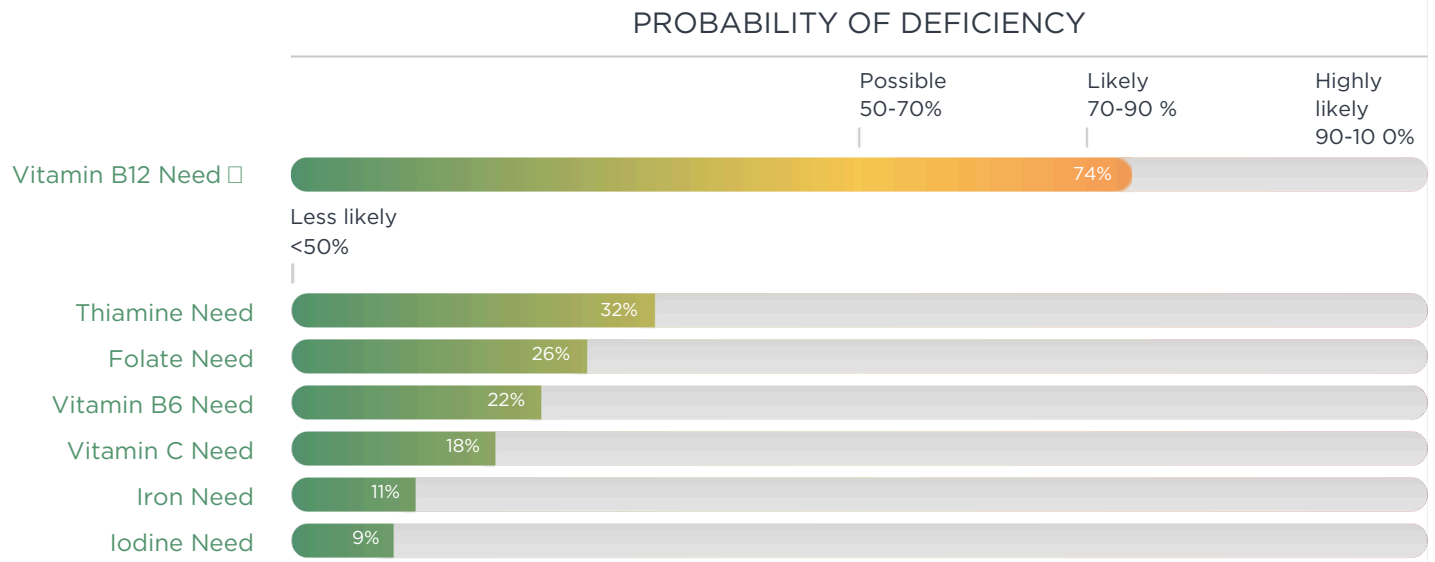
Biomarkers not available in this test - consider running in future tests:

GGT, Folate - Serum, Vitamin B12, Methylmalonic Acid, Folate - RBC

Individual Nutrient Deficiencies

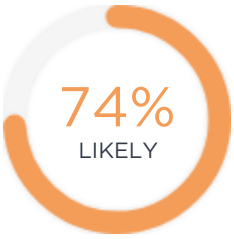
The scores represent the degree of deficiency for individual nutrients based on your patient's blood results. The status of an individual nutrient is based on a number of factors such as actual dietary intake, digestion, absorption, assimilation and cellular uptake of the nutrients themselves. All of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

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



Individual Nutrient Deficiency Details

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



Deficiency Likely.
Improvement require d.

VITAMIN B12 NEED

Your patient is likely trending towards a vitamin B12 deficiency, as evidenced by their increasing vitamin B12 need score. While there is a rising risk of deficiency, it is crucial to monitor their vitamin B12 status and overall hematological and neurological health. Factors such as inadequate dietary intake, gastrointestinal disorders, chronic use of certain medications, and conditions that impair vitamin B12 absorption can contribute to declining vitamin B12 levels. Evaluating these aspects and implementing dietary modifications to increase vitamin B12 intake, such as consuming more vitamin B12-rich foods (e.g., beef, clams, fortified cereals), and addressing potential factors that may impair absorption, may help improve vitamin B12 levels before considering supplementation.

Rationale

Homocysteine , MCV

Biomarkers considered

Homocysteine, MCV, RDW

Biomarkers not available in this test - consider running in future tests:

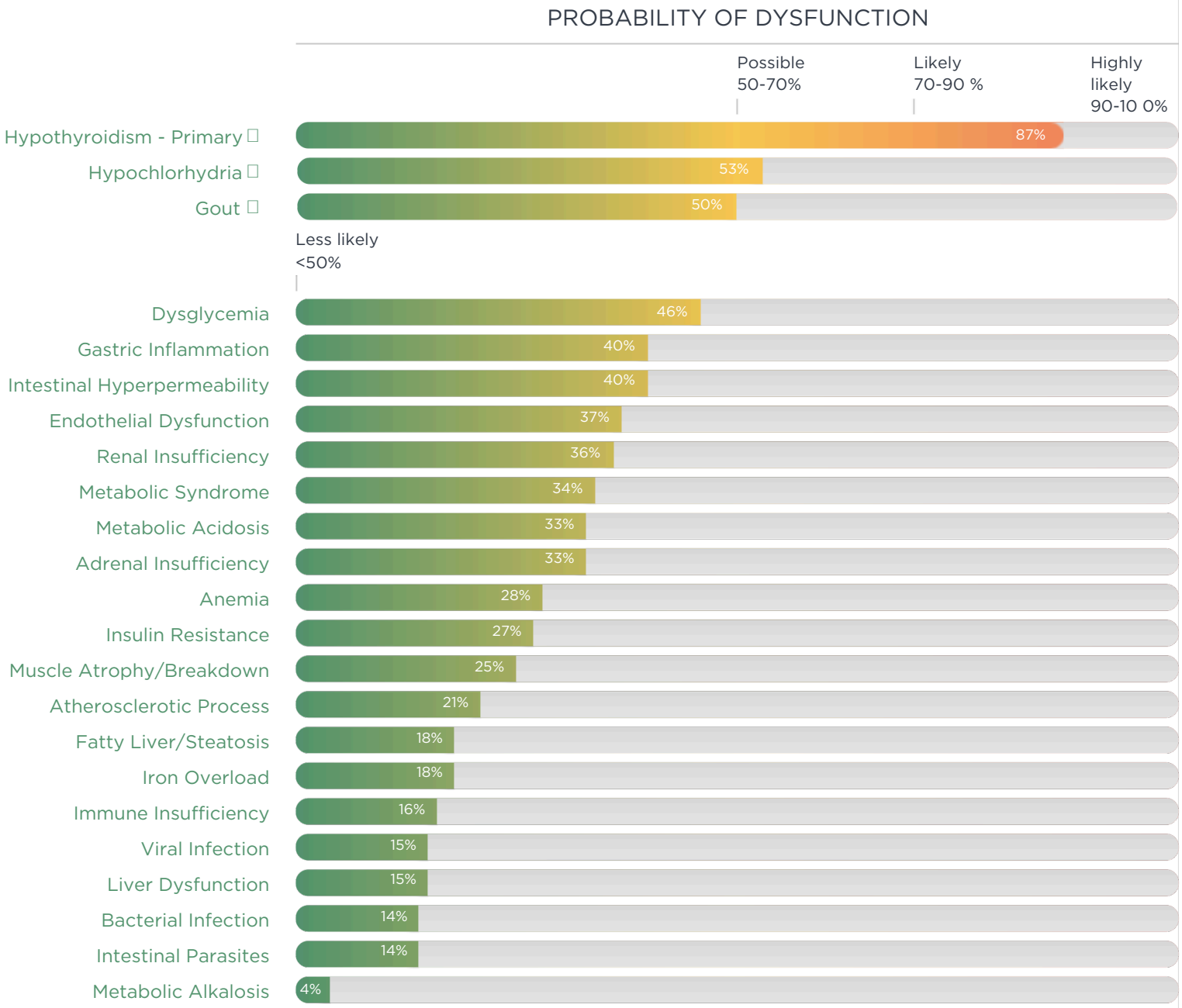
Vitamin B12, Methylmalonic Acid, LDH, Active B12

Clinical Dysfunctions

Advanced practitioner only report

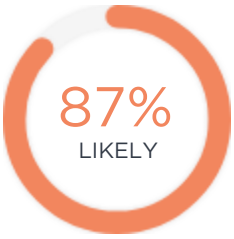
The Clinical Dysfunctions Report shows a list of likely Health Concerns that your client may be suffering from based on an analysis of their Chemistry Screen and CBC results.

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.



Clinical Dysfunctions Details

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



Dysfunction Likely. Improvement require d.

HYPOTHYROIDISM - PRIMARY

In primary hypothyroidism the problem is located in the thyroid gland itself, which fails to produce thyroid hormone. Consider primary hypothyroidism with an increased TSH, a decreased Total T4, a decreased Total T3, a decreased Free T4, a decreased Free T3 and a decreased T3-uptake. Additional elements that may be out of range with primary hypothyroidism include an increased total cholesterol and triglyceride level. Primary hypothyroidism is often preceded by autoimmune thyroid disease. If you have a patient with suspected thyroid disease you should screen for thyroid antibodies.

Rationale

TSH

Biomarkers considered

TSH, T4 - Total, T3 Uptake, Free Thyroxine Index (T7)

Biomarkers not available in this test - consider running in future tests:

T3 - Total, Cholesterol - Total, Triglycerides, T4 - Free, T3 - Free

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 , MCV

Biomarkers considered

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

Biomarkers not available in this test - consider running in future tests:

Phosphorus, Iron - Serum, Gastrin

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

Uric Acid , BUN

Biomarkers considered

Uric Acid, BUN, Creatinine

Biomarkers not available in this test - consider running in future tests:

Phosphorus, Cholesterol - Total

4

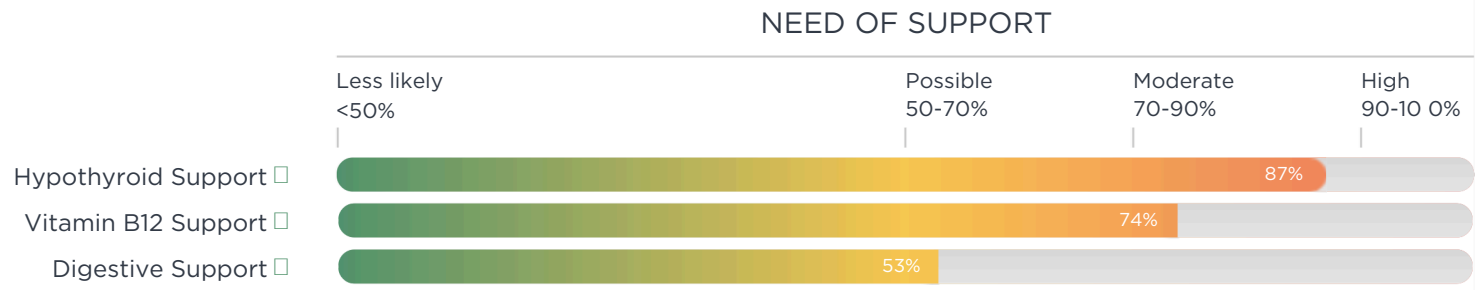
The Health Concerns report takes all the information on the Analytics and Assessment sections and focuses on the top areas of health concern that need the most support.

Health Concerns

Health Concerns Report

The Health Concerns Report takes all the information in this report and focuses on the top areas that need the most support.

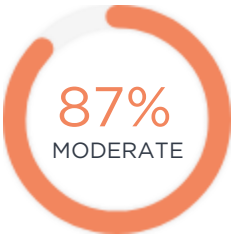
Each health concern is included in the following section so you can read an explanation of the results shown in this report.



Health Concerns Details

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

HYPOTHYROID SUPPORT

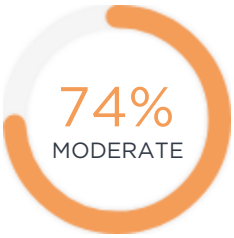


The results of this blood test indicate a tendency towards hypothyroidism and a need for thyroid gland support. If you haven't done so already, you may want to consider running a thyroid antibody panel to rule out autoimmune thyroiditis.

Rationale

TSH

VITAMIN B12 SUPPORT



The blood test results indicate that this patient's vitamin B12 level might be lower than optimal and that vitamin B12 supplementation may be needed.

Rationale

Homocysteine , MCV

DIGESTIVE SUPPORT

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

Rationale

BUN , Protein - Total , MCV

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.

PRIMARY HYPOTHYROIDISM

The results of this blood test indicate that this patient might be at an increased risk of Primary Hypothyroidism, which may be causing the biomarkers listed under "rationale" to be outside the optimal range. If you haven't done so already, you may want to consider running additional thyroid tests such as a Thyroid Antibody Panel to rule out possible Hashimoto's Thyroiditis. The Thyroid Antibodies to consider running are: Thyroid Peroxidase Antibodies (TPO Ab) and Thyroglobulin Antibodies (TGH Ab).

Rationale

TSH

Future Test Recommendations

Biomarkers listed here would have contributed to the assessment outcomes of this report, but were unavailable. Consider running them in the future.

Biomarkers A patient re sult was not available. Consider running in future tests.	Probability of Dysfunction	Assessment
DHEA-S	Blood Sugar Regulation - 50%	Functional Body System
Active B12	Vitamin B12 Need - 74%	Nutrient Deficiency
Cholesterol - Total	Hypothyroidism - Primary - 87%	Dysfunction
	Blood Sugar Regulation - 50%	Functional Body System
	Gout - 50%	Dysfunction
C-Peptide	Blood Sugar Regulation - 50%	Functional Body System
Free T3 : Reverse T3	Thyroid Function - 88%	Functional Body System
Fructosamine	Blood Sugar Regulation - 50%	Functional Body System
Gastrin	GI Function - 69%	Functional Body System
	Hypochlorhydria - 53%	Dysfunction
HDL Cholesterol	Blood Sugar Regulation - 50%	Functional Body System
HOMA2-IR	Blood Sugar Regulation - 50%	Functional Body System
Insulin - Fasting	Blood Sugar Regulation - 50%	Functional Body System
Iron - Serum	GI Function - 69%	Functional Body System
	Hypochlorhydria - 53%	Dysfunction
LDH	Vitamin B12 Need - 74%	Nutrient Deficiency
	Blood Sugar Regulation - 50%	Functional Body System

Biomarkers A patient re sult was not available. Consider running in future tests.	Probability of Dysfunction	Assessment
LDL Cholesterol	Blood Sugar Regulation - 50%	Functional Body System
Methylmalonic Acid	Vitamin B12 Need - 74%	Nutrient Deficiency
Phosphorus	GI Function - 69%	Functional Body System
	Hypochlorhydria - 53%	Dysfunction
	Gout - 50%	Dysfunction
Reverse T3	Thyroid Function - 88%	Functional Body System
T3 - Free	Thyroid Function - 88%	Functional Body System
	Hypothyroidism - Primary - 87%	Dysfunction
T3 - Total	Thyroid Function - 88%	Functional Body System
	Hypothyroidism - Primary - 87%	Dysfunction
T4 - Free	Thyroid Function - 88%	Functional Body System
	Hypothyroidism - Primary - 87%	Dysfunction
Triglycerides	Hypothyroidism - Primary - 87%	Dysfunction
	Blood Sugar Regulation - 50%	Functional Body System
Vitamin B12	Vitamin B12 Need - 74%	Nutrient Deficiency

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

Appendix

What to Look For When Values Are Out of Range

Advanced professional only report

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

Progesterone

0.30 ng/mL

Short Luteal Phase Syndrome
Low serum progesterone may be an indication of Short Luteal Phase Syndrome, which may indicate a disruption in a woman's menstrual cycle. Short Luteal Phase Syndrome can be associated with hyperestrogenism and estrogen dominance. It's important to remember that serum progesterone testing is a spot test, i.e. you do not know what day of the cycle you're doing the test on. As such a low progesterone test may be due to a natural low point in progesterone output or conditions such as Short Luteal Phase Syndrome. Suspicion of Short Luteal Phase Syndrome goes up with low serum progesterone below 0.2 ng/ml or 0.64 nmol/L and elevated serum estradiol above 352 pg/ml or 1292.2 pmol/L. Our recommendation, if you see low serum progesterone and suspect Short Luteal Phase Syndrome, is to order a full 30-day salivary hormone check for estrogens and progesterone or a DUTCH from Precision Analytical.

Uric Acid

4.80 mg/dL

Gout
Increa sed uric acid levels are associated with Gout, which is a condition in which uric acid crystals precipitate in the tissue, especially the big toe (tophi). If there is an increased uric acid, Gout is possible. The likelihood increases if there is also a decreased phosphorous, an increased cholesterol, an increased BUN and a normal or increased creatinine.
Increased risk of atherosclerosis, cardiovascular disease and stroke
An increased uric acid level is associated with chronic inflammatory s tates including those in the vascular system. This is one of the precipitating factors in the development of atherosclerosis. If there is an increased uric acid level with an increased triglyceride level in relation to total cholesterol with a decreased HDL and an increased LDL, atherosclerosis is probable. Platelet levels may also be increased. Homocysteine levels are frequently increased with atherosclerosis. Hs-CRP are frequently increased, and fibrinogen levels are frequently increased. If the above pattern is not present and the uric acid level is elevated still consider running a serum homocysteine, as a homocysteinuria may be the locus of a developing problem.
Oxidative Stress and Free Radical Activity
If the uric acid level is high, it could point to an overabundance of free radical activity and oxidative stress. This condition should be explored further if the total cholesterol level suddenly drops from its usual range. Other potential signs include a decrease in lymphocyte count, albumin, and platelet levels. An increase in total globulin also indicates a free radical pathology, heightening the risk for neoplasm development. Oxidative stress can lead to a higher red blood cell destruction rate, often marked by an elevated bilirubin level.

Rheumatoid Arthritis Elevated uric acid leve ls often correspond with chronic inflammation and are a common characteristic of conditions like Rheumatoid Arthritis. The development of rheumatoid arthritis may be indicated by an increase in uric acid level, an elevated ESR, and a decrease or normal level of albumin and alkaline phosphatase. The serum calcium level might be increased or remain normal. To better understand the nature of the joint pain, consider further investigation with appropriate diagnostic tests or a Rheumatoid panel.

Renal insufficiency
Elevated uric acid le vels can be indicative of renal insufficiency. This condition is often overlooked. Renal insufficiency should be suspected if there is an increase in BUN level, even with normal or elevated serum creatinine. Concurrently, uric acid levels might be normal or increased, as can serum phosphorous. Both LDH and AST are usually within the normal range. Renal disease
Higher uric aci d levels are often associated with decreased renal function. The presence of increased BUN, serum creatinine, BUN/creatinine ratio, urine specific gravity, uric acid, serum phosphorous, LDH, and AST may indicate impaired renal function. If such a pattern is observed, the condition should either be ruled out or referred to a qualified practitioner.
Circulatory disorders
patients who exhibit in creased uric acid levels should be evaluated for potential circulatory disorders. Poor circulation activates the enzyme Xanthine oxidase, crucial for uric acid formation, resulting in elevated uric acid levels and a superoxide radical. Conditions like Hypertension, Raynaud's, Atherosclerosis, and Polycythemia should be considered and treated accordingly. Intestinal Hyperpermeability
Consider an altered intestinal permeability when uric acid levels are elevated, and an underlying inflammatory issue exists. Various organisms such as bacteria, yeast, and amoebas and their toxins can be readily absorbed in a compromised digestive barrier, often leading to an auto-immune response. Treatment should focus on restoring gut integrity and correcting the dysbiotic terrain. Note that a common initial reaction, known as the Herxheimer reaction, might occur due to an increased release of endotoxins during early treatment.

Albumin : Globulin

2.30 ratio □

An increased Albumin: Globulin ratio is fairly uncommon and is usually due to dehydration.

Anion Gap

17.00 mEq/L ☒

Metabolic Acidosis
Consider metabolic acidosis if the anion gap is increased along with a decreased CO2 and an increased chloride.

Apolipoprotein B

97.00 mg/dL □

Increased risk of CVD
Elevated Apo B corres ponds to elevated LDL and non-HDL cholesterol with an associated increased risk of cardiovascular disease.

Decreased LDL clearing
A reduction in the cleara nce of LDL from the bloodstream will lead to increased Apo B levels.

High-fat diet
A high-fat die t may promote increased levels of Apo B.

Diabetes
Diabetes can be a secondary cause of elevated Apo B.

Metabolic syndrome
Elevated Apo B corre lates with increased risk of metabolic syndrome.

Hypothyroidism
Apo B levels may be elevated in hypothyroidism.

Bilirubin - Total

0.40 mg/dL □

Oxidative stress
Suspect oxidativ e stress with a decreased total bilirubin.

Systemic Inflammation
Suspect an increased ris k of systemic inflammation with a decreased total bilirubin.

Spleen insufficiency
Suspect spleen insuffi ciency with a decreased total bilirubin, HGB and RBC, with increased serum iron.

BUN

17.00 mg/dL ☒

Renal disease
Consider impa ired 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 l evel 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 incr eased 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, and a decreased alkaline phosphatase.

Diet- excessive protein intake or catabolism
Since the BUN level is dependent on dietary p rotein, 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 increas ed BUN level in the absence of other causes may be due to dysbiosis.

Edema
An incr eased 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 v iewed 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

23.00 Ratio □

Renal disease
Consider impa ired 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.

Calcium

9.70 mg/dL ☒

Parathyroid Hyperfunction
Parathyroid hyperfunction w ill cause an increase in PTH levels, which can lead to significantly increased serum calcium above the normal reference range. If the serum calcium is significantly increased above the *normal* reference range with a decreased phosphorous parathyroid hyperfunction is possible. Alkaline phosphatase levels may also be increased, along with a normal or decreased serum or RBC magnesium. Follow-up with a serum parathyroid hormone test. If parathyroid hormone levels are also increased, presume clinical hyperparathyroidism exists.

Thyroid dysfunction (primary or secondary)
Serum calcium may be increased in either pri mary thyroid hypofunction or secondary thyroid hypofunction due to anterior pituitary hypofunction. With primary hypothyroidism the calcium levels may be increased along with an increased TSH. With secondary thyroid hypofunction due to anterior pituitary hypofunction, the calcium levels may be increased along with a decreased TSH.

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

CO2

24.00 mEq/L

Metabolic Acidosis
Serum CO2, or bica rbonate will be decreased (<25), in metabolic acidosis. Consider metabolic acidosis if the CO2 is decreased (<25), along with an increased chloride (>106) and/or an increased anion gap (>12).

Respiratory alkalosis
The CO2 levels (<25) are often decreased in respiratory alkalosis, which is due to conditions that cause excess loss of CO2 from the lungs. The classic presentation of this phenomenon is hyperventilation syndrome caused by hysteria, anxiety, stress, etc. Other causes include low blood pressure, shock, direct stimulation of the respiratory centers by drugs or trauma, and high altitude. Bicarbonate is lost due to the formation of CO2 in the lungs.

Cortisol - Total/AM

18.50 µg/dL

Adrenal Stress
Adrenal stress c auses an increase in the secretions of the glucocorticoid hormone cortisol. Other values that may be out of balance include increased serum sodium and decreased serum potassium. If the cortisol level is significantly elevated, rule out adrenal adenoma. Urinary chloride will be decreased. Adrenal stress can be confirmed with salivary cortisol studies.

Creatinine

0.73 mg/dL

Muscle Atrophy/Nerve-Muscle Degeneration
Due to its connection to muscle metabolism s erum creatinine will be decreased in cases of muscle atrophy or nerve-muscle degeneration.

eAG

108.28 mg/dL

Diabetes
Estimated average glucose has a linear relationship with HbA1C as demonstrated in the A1C-Derived Average Glucose (ADAG) study. An eAG above 137 mg/dL (7.6 mmol/L) indicates diabetes. HbA1C and eAG had a stronger associated with preprandial than postprandial blood glucose in both type 1 and type 2 diabetes.

Although eAG maybe useful for long term glycemic management, it may not reflect extreme highs and lows over the 2-3 month period.
Insulin resistance
Insulin resistance with accompanying elevated blood glucose may present with elevated eAG levels over time.
Metabolic Syndrome
The clustering of risk factors associated with metabolic syndrome (insulin resistance, hypertension, dyslipidemia, and obesity) increase the risk of developing type 2 diabetes and cardiovascular disease. An increasing eAG suggests an increasing progression toward type 2 diabetes.
Pre-diabetes
An estimated glucose of 117-137 mg/dL (6.5-7.6 mmol/L) indicates impaired glucose tolerance and will likely progress to diabetes without nutrition and lifestyle intervention.

Cardiovascular risk
Hyperglycemia incre ases the risk of cardiovascular disease.

Estimated average glucose and HbA1C have a stronger association with CVD risk than fasting blood glucose, postprandial glucose, or glucose variability in diabetics.

Elevated HbA1C was associated with higher systolic blood pressure, total cholesterol, and hs-CRP, as well as lower HDL.

Estradiol

<5.00 pg/mL

Menopause
Low levels o f estradiol are a finding in post-menopausal women. Declining levels may signal the onset of menopause in your peri-menopausal patients.

Osteoporosis and Bone Fractures
Low levels of estradiol can be a ris k factor for osteoporosis and bone fracture. Researchers at the Creighton University School of Medicine in Omaha, NE, observed that in women aged 65-75, low levels of serum total and bio-available estradiol correlated with low levels of bone mineral density in the femur, spine, and total body.
Migraine Headaches
Hormone imbalance may be a cause of migraine headaches in women. Declining estrogen levels during menstruation and menopause may trigger migraine headaches. By contrast, sustained high levels of estrogen, as occur during pregnancy, frequently provide relief from headaches. Estrogen produces changes in body levels of prostaglandins and opioids, which may account for its effects in relieving headaches.

Ferritin

103.00 ng/mL

Hemochromatosis/ hemosiderosis/iron overload
Hemochromatosis is a condition caused by excess ive 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 be st 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 ca n 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.
Insulin Resistance in Menopause

Ferritin can increase significantly in menopause and be associated with increased fasting glucose and insulin resistance.

FSH

41.00 mIU/mL

Menopause
Elevated FS H levels will be seen during and after menopause. Increasing levels may signal the onset of menopause in your peri-menopausal patients. Levels of about 30 - 40 mIU/ml usually signify menopause.

Mid-Cycle FSH Surge
Levels of FSH will spik e mid-cycle and levels may be as high as 18 mIU/ml are normal if the blood sample is taken mid-cycle.

Ovarian hypofunction or failure
Elevated FSH levels may be a sig n of ovarian hypofunction or ovarian failure, a situation where the body is not producing enough estrogen to maintain optimal ovarian function.

Polycystic Ovary Syndrome (PCOS)
Increased levels of FSH are associate d with Polycystic Ovary Syndrome (PCOS), a dysfunction with the ovaries. Typically the LH level is higher than the FSH level and the LH:FSH ratio is >2 and you may also see a corresponding increase in both Total and Free testosterone.

Globulin - Total

2.00 g/dL

Digestive Inflammation/Gastritis
Suspect primary digestive inflamm ation or inflammation secondary to HCL insufficiency. The pattern will be similar to that of hypochlorhydria but the globulin may be decreased unless inflammation is severe. Many patients with the subjective and laboratory indications of HCI need experience an aggravation of their symptoms when taking HCL supplementation. Patients with this type of reaction probably have gastric inflammation due to a long-term HCL need. If inflammation is suspected or present, support the digestive terrain to heal the inflammation appropriately for 3 to 4 weeks prior to initiating HCl therapy. Acute digestive inflammation may lead to an increased globulin level due to the increased production of inflammatory immunoglobulins. Chronic digestive inflammation due to colitis, enteritis, Crohn's etc., will compromise protein breakdown and absorption, leading to a widespread protein deficiency in the body and a decreased level of the inflammatory immunoglobulins, hence the decreased total globulin level. Decreased total globulin, decreased serum phosphorous, increased BUN, increased basophils, an increased gastrin and an increased ESR.

Immune insufficiency
A decreased total glob ulin suggests immune insufficiency. Suspect an increased use of globulin by the liver, spleen, thymus, kidneys, or heart. Apart from known kidney or heart dysfunction, rule out a chronic immune disruptor (virus, xenobiotics, toxicity etc.) and consider a serum protein electrophoresis test (look for a decreased gamma fraction) in the investigation of immune insufficiency.

Glucose Fasting

90.00 mg/dL

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

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

Metabolic Syndrome / insulin resistance
Metabolic Syndrome or hyperinsulinemia is a cluster of related symptoms: Increased triglycerides, increased total cholesterol, decreased HDL cholesterol, obesity, increased blood insulin levels, increased glucose and increased blood pressure. The hallmark of this syndrome is the insulin resistance that leads to high glucose levels and an imbalance in blood fats. The overall effect is an increased risk for cardiovascular disease and diabetes.

Thiamine (Vitamin B1) need
An increased glucose is asso ciated with a thiamine need. Thiamine transports glucose across the blood brain barrier and is an essential component in the enzymatic conversion of pyruvate into acetyl CoA that allows pyruvate to enter the Kreb's cycle. If glucose is increased and the hemoglobin A1C is normal, thiamine need is possible. If CO2 is decreased and the anion gap is increased along with moderately high serum glucose, thiamine need is probable. Due to thiamine's role in glycolysis, LDH levels may be decreased.

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

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

Fatty liver (early development) and Liver congestion
High blood glucose levels have been associated with in creased levels of blood fats, e.g. high total cholesterol, LDL and triglycerides, low HDL. In individuals with liver congestion, this may lead to the deposition of fat in the liver and the development of fatty liver.

Hemoglobin A1C

5.40 % □

Diabetes mellitus
This test is a meas urement of long-term blood glucose control and management. Values will be increased in patients with poorly controlled diabetes. It is important to remember that a patient who has recently made the changes to control their short-term blood glucose levels may still show elevated levels of glycosylated hemoglobin.

Insulin resistance (early stage) and glucose intolerance
An increased hemoglobin A1C above the optimal range i s a sign that this individual is not controlling their long-term glucose levels very well. They are possibly in the insulin-resistant phase, also known as a pre-diabetic state. Research has shown that individuals progress through several stages of insulin resistance and glucose intolerance before becoming a classic type II diabetic. The stages include: Normal glucose tolerance hypoglycemia (often due to hyperinsulinemia) insulin insensitivity/resistance eventually overt type II diabetes.

Homocysteine

11.80 µmol/L □

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

Additional diseases and pathological processes associated with an increased homocysteine

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

LH

18.30 mIU/mL

Mid-Cycle LH Surge
Levels of LH will surg e mid-cycle and levels as high as 76.3 mIU/ml are normal if the blood sample is taken mid-cycle.
Ovarian hypofunction
Elevated LH levels may be a sign of ovarian hypofunction, which is when the ovaries produce little to no hormones.
Polycystic Ovary Syndrome (PCOS)
Increased levels of LH are associated with Polycystic Ovary Syndrome (PCOS), a dysfunction with the ovaries. Typically the LH:FSH ratio is >2 and you may also see a corresponding increase in both Total and Free testosterone.

Menopause
Elevated LH levels will be seen during and after menopause. increasing levels may signal the onset of menopause in your peri-menopausal patients.

MCHC

32.90 g/dL

Vitamin C need
A decreased MC HC 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 c ommon 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 prevalen t 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 increasedor 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 c ells, 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

95.00 fL

Anemia- Vitamin B12 and/or Folate deficiency
B12 and folate are needed for proper nucleus de velopment. 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. If there is also an increased MCH, RDW, MCHC, and LDH (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 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 total globulin. Hypochlorhydria is probable if BUN is increased and/or serum phosphorous is decreased. Vitamin C need Consider a vitam in C need if there's a decreased albumin along a decreased HCT, HGB, MCH, MCHC, serum iron. There also may be an increased MCV, alkaline phosphatase, fibrinogen and RBCs.

Monocytes - %

8.00 %

Recovery phase of acute infection
Due to their phagocytic function m onocytes 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 - % and an increased Monocytes - Absolute count towards the end of an infection.

Liver dysfunction
Not a primary mar ker but if an increased Monocyte - Absolute count and/or an increased Monocyte - % 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 - A bsolute count is elevated and/or the Monocyte - % is elevated with increased Eosinophils - %, increased Eosinophils - Absolute count, increased Basophils - % and increased Basophils - Absolute count, 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 and/or an increased M onocytes- % may be associated with prostatic hypertrophy, especially If the serum creatinine is elevated 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, along with a normal BUN and electrolytes. The likelihood of BPH increases when there is also an increased Monocytes- Absolute count and an increased

Monocytes- %, along with an increased 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.

Monocytes - Absolute

0.50 k/cumm □

Recovery phase of acute infection
Due to their phagocytic function m onocytes 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 - % and an increased Monocytes - Absolute towards the end of an infection.

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Neutrophil : Lymphocyte

1.74 Ratio □

Bacterial infection
An elevated NLR is associated with bacterial infection and can help differentiate between bacterial and viral infections which, in turn, can help determine whether antibiotics would be indicated in patients with fever. An elevated NLR in those with sepsis is associated with poorer outcomes.

Inflammation
NLR is consid ered a marker of systemic inflammation and is elevated in inflammatory disorders, vasculitis, cancer, and Alzheimer's disease.

Metabolic dysfunction
Elevated NLR is observ ed in metabolic syndrome, diabetes mellitus, renal or hepatic dysfunction, and thyroid dysfunction.

Arteriosclerosis, Atherosclerosis
Elevated NLR has been associate d with increased pulse-wave velocity, an indicator for early atherosclerotic changes. It has

also been associated with arteriosclerosis (stiffening or hardening of the artery wall).

Cardiovascular disease
Elevated NLR is associa ted with cardiovascular disease, congestive heart failure, cardiac arrhythmias, acute coronary syndrome, endothelial dysfunction, and atherosclerosis.

Platelet : Lymphocyte (PLR)

139.47 Ratio □

Atherosclerosis severity
An elevated PLR is assoc iated with more severe, advanced atherosclerosis and a higher Gensini score, a score that reflects the extent and severity of atherosclerosis.

Bipolar disorder
A higher PLR, su ggestive of inflammatory activation, is associated with bipolar disorder, especially during the manic phase.
Cancer prognosis
A higher PLR is as sociated with a poorer cancer prognosis, including in cases of breast, ovarian, cervical, and prostate cancers.

Cardiovascular disease and complications
Increased PLR is associated with cardiovasc ular disease, the degree of atherosclerosis, and the relative risk of major adverse cardiac events (MACE), associated mortality, and acute coronary syndrome.

Heart failure
Increased PL R is associated with worsening heart failure, especially in conjunction with other inflammatory indicators such as the neutrophil:lymphocyte count.

Inflammation and thrombosis
An elevated ratio of platelets t o lymphocytes suggests a thrombotic, pro-inflammatory state characterized by an increase in platelets, especially activated platelets, and a decrease in lymphocytes, which are destroyed by inflammation. Elevated PLR is often associated with other inflammatory markers including NLR, CRP, and fibrinogen.
Rheumatoid arthritis
A significantly higher PLR has been associated with rheumatoid arthritis, an inherently inflammatory disorder.
Stroke
Elevate d PLR is associated with acute ischemic stroke and increased risk of unfavorable outcomes.

Protein - Total

6.60 g/dL □

Hypochlorhydria
A decreased or n ormal 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 and a normal or decreased total protein and/or albumin. Hypochlorhydria is probable if globulin levels are increased along with an increased BUN, a decreased or normal total protein and/or 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 and a decreased iron, a decreased CO2, and a decreased alkaline phosphatase.

Digestive dysfunction/ inflammation
Suspect primary digestive inflammatio n or inflammation secondary to HCL insufficiency with a low total protein. This pattern will be similar to that of Hypochlorhydria but the globulin may be decreased unless inflammation is severe. Decreased total globulin, decreased serum phosphorous, increased BUN, increased basophils, and increased 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 may be indicative of 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. Some of the key clinical indicators include:

- Pain between shoulder blades
- Stomach upset by greasy foods
- If drinking alcohol, easily intoxicated
- Headache over the eye
- Sensitive to chemicals (perfume, cleaning solvents, insecticides, exhaust, etc.)
- 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 decre ased total protein can be an indicator of digestive dysfunction, which will greatly compromise protein digestion and absorption. Protein malnutrition is due primarily to the lack of available essential amino acids in the diet.

Sodium : Potassium

27.80 ratio □

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

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

TSH

4.94 mIU/L ☒

Primary hypothyroidism
In primary hypothyroidism the problem is located in the thyroid gland itself, which fails to produce thyroid hormone. Primary hypothyroidism is often preceded by autoimmune thyroid disease. If you have a patient with suspected thyroid disease you should screen for thyroid antibodies. Primary hypothyroidism will present with increased TSH levels and you may see a normal or decreased total T4 level and/or T-3, free T4, free T3, increased cholesterol and triglyceride levels.

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