OPTIMAL HEALTH SYSTEMS
Where Health Comes Naturally

HEALTH REPORT

Created For

John Doe

Date of Birth

1999-01-01

Report Date

July 2025

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Lab Test Results

This report lists the results of your lab work. This shows you which markers are outside of the optimal range and need some attention.

Nutrients Rx Results

Report Date: July 31, 2025

46	**Optimal** Decreased by 16	15	**Functional** Increased by 5	11	**Clinical** Increased by 8

Lab Test	Current	Clinical Low	Functional Low	Optimal	Functional High	Clinical High
Cholesterol, Total	**191**	0 - 99	100 - 154	155 - 175	176 - 199	200 or higher
HDL Cholesterol	**49**	0 - 39	40 - 59	60 - 85	86 - 99	100 or higher
Triglycerides	**90**	0 - 36	37 - 74	75 - 100	101 - 149	150 or higher
LDL Cholesterol	**126**	0 - 10	11 - 34	35 - 85	86 - 100	101 or higher
Non HDL Cholesterol		- -	- -	0 - 109	110 - 129	130 or higher
CHOL/HDLC Ratio	**3.89**	- -	- -	0 - 2.99	3 - 4.99	5 or higher
Alkaline Phosphatase	**64**	0 - 34	35 - 69	70 - 115	116 - 144	145 or higher
C - Reactive Protein HS	**1.02**	- -	- -	0 - 0.99	1 - 3	3.01 or higher
Glucose	**85**	0 - 63	63.01 - 78	78.01 - 94	94.01 - 99	99.01 or higher
Hemoglobin A1c	**5.4**	- -	- -	0 - 5.7	5.71 - 6.4	6.4 or higher
Urine - Glucose	**NEGATIVE**	FEW	TRACE	0 - 3 NEGATIVE	3.01 - 6 MODERATE	6.01 or higher POSITIVE
Urine - Ketones	**NEGATIVE**	FEW	TRACE	0 - 0.99 NEGATIVE	MODERATE	1 or higher POSITIVE
Uric Acid	**5.4**	0 - 1.9	2 - 3.6	3.7 - 6	6.1 - 8.6	8.7 or higher
Protein, Total	**6.4**	0 - 6	6.01 - 6.49	6.5 - 7.5	7.51 - 8	8.01 or higher
Albumin	**4.5**	0 - 3.5	3.6 - 3.9	4 - 4.9	5 - 5.1	5.2 or higher
Globulin	**2**	0 - 1.8	1.81 - 2	2.01 - 3.2	3.21 - 3.7	3.71 or higher
Albumin/Globulin Ratio	**2.25**	0 - 1	1.1 - 1.4	1.41 - 2	2.01 - 2.5	2.51 or higher

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Lab Test	Current	Clinical Low	Functional Low	Optimal	Functional High	Clinical High
Testosterone, Total, Ms	**883**	0 - 249	250 - 391	392 - 800	801 - 825	826 or higher
Testosterone, Free	**167**	0 - 45.99	46 - 99.99	100 - 210	210.01 - 224.99	225 or higher
Testosterone, Bioavailable		0 - 109.99	110 - 299.99	300 - 525	525.01 - 575	575.01 or higher
PSA, Total	**5.4**	- -	- -	0 - 4	4.01 - 8	8.01 or higher
Estrogens, Total Levels fluctuate based on cycle. See "Range Report" for more details.	**100**	0 - 45.49	45.5 - 94.74	94.75 - 173.25	173.26 - 212.5	212.51 or higher
Sex Hormone Binding Globulin	**45.8**	0 - 21	22 - 45	46 - 55	56 - 77	78 or higher
TSH	**3.96**	0 - 0.4	0.41 - 0.99	1 - 3.5	3.51 - 4.5	4.51 or higher
Hemoglobin	**14**	0 - 12.9	13 - 14.5	14.6 - 16.6	16.7 - 17.1	17.2 or higher
Hematocrit	**41.9**	0 - 35	35.01 - 37.4	37.41 - 44	44.01 - 44.99	45 or higher
White Blood Cell Count	**6.9**	0 - 3.3	3.4 - 4.4	4.5 - 8.5	8.6 - 10.8	10.9 or higher
Red Blood Cell Count	**4.4**	0 - 3.76	3.77 - 4.09	4.1 - 5.1	5.11 - 5.28	5.29 or higher
MCV	**95**	0 - 79.9	80 - 83.9	84 - 95	95.1 - 100	100.1 or higher
MCH	**31.8**	0 - 27	27.1 - 27.9	28 - 32	32.1 - 33	33.1 or higher
MCHC	**33.4**	0 - 31.9	32 - 32.5	32.6 - 35	35.1 - 36	36.1 or higher
RDW	**12.3**	0 - 7.99	8 - 10	10.01 - 14	14.01 - 15	15.01 or higher
Platelet Count	**294**	0 - 74	75 - 149	150 - 400	401 - 454	455 or higher
MPV		0 - 9.3	9.4 - 10.5	10.6 - 11.9	12 - 12.2	12.3 or higher
Neutrophils	**61**	0 - 39.9	40 - 49.9	50 - 65	65.1 - 74.9	75 or higher
Lymphocytes	**25**	0 - 13.9	14 - 21.9	22 - 38.9	39 - 46.9	47 or higher
Eosinophils	**3**	- -	- -	0 - 2.9	3 - 5.9	6 or higher
Basophils	**1**	- -	- -	0 - 2.5	2.6 - 3.9	4 or higher
Monocytes	**10**	- -	- -	0 - 8.9	9 - 9.9	10 or higher
Absolute Neutrophils	**4200**	0 - 1499	1500 - 1999	2000 - 5000	5001 - 7800	7801 or higher
Absolute Lymphocytes	**1900**	0 - 849	850 - 998	999 - 2999	3000 - 3900	3901 or higher
Absolute Eosinophils	**200**	0 - 14.9	15 - 100.9	101 - 300	300.1 - 499.9	500 or higher
Absolute Basophils	**100**	0 - 14	15 - 50	51 - 150	151 - 200	201 or higher

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Lab Test	Current	Clinical Low	Functional Low	Optimal	Functional High	Clinical High
Absolute Monocytes	**700**	0 - 199	200 - 349	350 - 700	701 - 950	951 or higher
Absolute Nucleated RBC		- -	- -	0 - 0.9	- -	1 or higher
Calcium	**9.3**	0 - 8.05	8.06 - 9.01	9.02 - 10.5	10.51 - 11.03	11.04 or higher
Iron, Total	**169**	0 - 49	50 - 99	100 - 150	151 - 180	181 or higher
Iron Binding Capacity	**283**	0 - 124	125 - 200	201 - 400	401 - 450	451 or higher
% Saturation	**60**	0 - 14	15 - 19	20 - 45	46 - 54	55 or higher
Ferritin	**91**	0 - 12.99	13 - 50.99	51 - 100.99	101 - 300.99	301 or higher
Magnesium	**2.5**	0 - 1.5	1.6 - 2	2.1 - 3	3.1 - 3.2	3.3 or higher
Carbon Dioxide (CO2)	**19**	0 - 19	19.1 - 21.9	22 - 29	29.1 - 32	32.1 or higher
Sodium	**138**	0 - 133	134 - 135	136 - 143	144 - 146	147 or higher
Potassium	**4**	0 - 3	3.1 - 3.9	4 - 4.9	5 - 5.2	5.3 or higher
Chloride	**97**	0 - 97	98 - 99	100 - 105	106 - 110	111 or higher
Vitamin B12	**1200**	0 - 200	201 - 399	400 - 950	951 - 1100	1101 or higher
Vitamin D	**67.7**	0 - 40	41 - 59	60 - 90	91 - 109	110 or higher
AST	**36**	0 - 9	10 - 12	13 - 24	25 - 35	36 or higher
ALT	**29**	0 - 5	6 - 9	10 - 23	24 - 27	28 or higher
Bilirubin	**NEGATIVE**	FEW	TRACE	NEGATIVE	MODERATE	POSITIVE
Bilirubin, Total	**0.8**	- -	- -	0 - 1.5	1.6 - 2.5	2.6 or higher
eGFR	**46**	0 - 59	60 - 64	65 - 140	141 - 150	150 or higher
Creatinine	**1.7**	0 - 0.56	0.57 - 0.74	0.75 - 1.2	1.21 - 1.35	1.35 or higher
Urea Nitrogen (BUN)	**14**	0 - 5	6 - 9	10 - 22	23 - 25	26 or higher
BUN/Creatinine Ratio	**8**	0 - 5.99	6 - 9.99	10 - 20.99 NOT APPLICABLE	21 - 23.99	24 or higher
Color	**YELLOW**	- -	- -	YELLOW	DARK YELLOW	CLOUDY
Appearance	**CLEAR**	- -	- -	CLEAR	CLOUDY	TURBID
Specific Gravity	**1.021**	0 - 0.93	0.93 - 1	1 - 1.03	1.03 - 1.06	1.06 or higher
Ph	**7**	0 - 2.99	3 - 4.99	5 - 8	8.01 - 8.99	9 or higher
Reducing Substances		- -	- -	- -	- -	- -

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Lab Test	Current	Clinical Low	Functional Low	Optimal	Functional High	Clinical High
Occult Blood	**NEGATIVE**	FEW	TRACE	NEGATIVE	MODERATE	POSITIVE
Protein	**NEGATIVE**	FEW	TRACE	0 - 0 NEGATIVE	MODERATE	0.01 or higher POSITIVE
Nitrite	**NEGATIVE**	FEW	TRACE	NEGATIVE	MODERATE	POSITIVE
Leukocyte Esterase	**NEGATIVE**	FEW	TRACE	0 - 2 NEGATIVE	2.01 - 3 MODERATE	3.01 or higher POSITIVE
WBC - Urinalysis	**NONE SEEN**	FEW	TRACE	0 - 5 NONE SEEN	5.01 - 10 MODERATE	10.01 or higher MANY
RBC - Urinalysis	**None seen**	FEW	TRACE	0 - 2 NONE SEEN	2.01 - 4 MODERATE	4.01 or higher MANY
Squamous Epithelial Cells		FEW	TRACE	0 - 5 NONE SEEN	5.01 - 10 MODERATE	10.01 or higher MANY
Bacteria	**NONE SEEN**	FEW	TRACE	NONE SEEN	MODERATE	MANY
Calcium Oxalate Crystals		FEW	TRACE	NONE SEEN	MODERATE	MANY
Crystals		- -	- -	- -	- -	- -
Hyaline Cast		FEW	TRACE	NONE SEEN	MODERATE	MANY
Casts	**NONE SEEN**	- -	- -	- -	- -	- -
Amorphous Sediment		- -	- -	- -	- -	- -
Transitional Epithelial Cells		- -	- -	- -	- -	- -
Renal Epithelial Cells		- -	- -	- -	- -	- -
Triple Phosphate Crystals		- -	- -	- -	- -	- -
Granular Cast		- -	- -	- -	- -	- -
Yeast		- -	- -	- -	- -	- -
Uric Acid Crystals		- -	- -	- -	- -	- -

PlasticTest Results

Report Date: February 13, 2025

Microplastics have been called the "health crisis of this generation". PlasticTest is the only lab-validated test that detects 7 major plastic types in your bloodstream and categorizes them by size to provide maximum insight. Take a second PlasticTest after 90 days to see how much your plastic levels have decreased.

13	**Microplastics Total** from 463 - decreased by 450	2	**Microplastic Size 0-10** from 211 - decreased by 209
8	**Microplastic Size 10-30** from 250 - decreased by 242	3	**Microplastic Size 30-70** from 2 - increased by 1

Interpreting Test Results

Lab Results include the presence or absence of microplastics and nanoplastics (MNPs) detected at each size. The corresponding sizes for each MNP is listed beside each size range. Calculated concentration, expressed in particles per mL, is listed beside each detected range of MNP.

Plastics Included in Test

PET - Polyethylene Terephthalate is most commonly found in synthetic textiles. It most generally appears as fibrous-shaped molecules.

PA - Polyamides are most commonly found in synthetic textiles. It most generally appears as film or fibrous-shaped molecules.

PP - Polypropylene generally occurs as a product in the deterioration of larger waste. It generally appears as a film or in fragment-shaped molecules.

PE - Polyethylene generally occurs as a product in the deterioration of larger waste, and is found in personal care products. It generally appears as a film, granular, or in fragment-shaped molecules.

PU - Polyurethane is most commonly found in packaging. It generally appears in foam-shaped molecules.

PVC - Polyvinyl Chloride is most commonly found in packaging. It generally appears in foam-shaped molecules.

PS - Polystyrene is most commonly found in packaging. It generally appears in foam-shaped molecules.

Deep Dives Results

Report Date: July 31, 2025

Thyroid

Lab Test	Current	Clinical Low	Functional Low	Optimal	Functional High	Clinical High
TSH	**3.6**	0 - 0.4	0.41 - 0.99	1 - 3.5	3.51 - 4.5	4.51 or higher
T4, Free (Direct)	**1.45**	0 - 0.81	0.82 - 1.13	1.14 - 1.45	1.46 - 1.76	1.77 or higher
Thyroglobulin Antibody	**2.1**	- -	- -	0 - 0.58	0.59 - 2.99	3 or higher
Triiodothyronine (T3), Free	**2.79**	0 - 1.99	2 - 2.8	2.81 - 3.6	3.61 - 4.4	4.41 or higher
Thyroid Peroxidase (TPO) Antibody	**18.0**	- -	- -	0 - 5	5.01 - 29.99	30 or higher
Reverse T3, Serum	**13.9**	0 - 9.2	9.21 - 14.16	14.17 - 19.13	19.14 - 24.09	24.1 or higher

Male Hormone

Lab Test	Current	Clinical Low	Functional Low	Optimal	Functional High	Clinical High
Testosterone, Total, Ms	**870**	0 - 249	250 - 391	392 - 800	801 - 825	826 or higher
Estrogens, Total Levels fluctuate based on cycle. See "Range Report" for more details.	**121**	0 - 45.49	45.5 - 94.74	94.75 - 173.25	173.26 - 212.5	212.51 or higher
Sex Hormone Binding Globulin	**45.8**	0 - 21	22 - 45	46 - 55	56 - 77	78 or higher
Dehydroepiandrosterone (DHEA)	**158**	0 - 30.99	31 - 254.33	254.34 - 477.66	477.67 - 700.99	701 or higher
Free Androgen Index	**65.9**	0 - 23.99	24 - 56.66	56.67 - 89.33	89.34 - 121.99	122 or higher
Luteinizing Hormone (LH)	**5.3**	0 - 1.69	1.7 - 4	4.01 - 6.3	6.31 - 8.59	8.6 or higher
Progesterone	**.025**	0 - 0.11	0.12 - 0.24	0.25 - 0.36	0.37 - 0.49	0.5 or higher
FSH	**5.6**	0 - 1.49	1.5 - 5.13	5.14 - 8.76	8.77 - 12.39	12.4 or higher
Prolactin	**21.4**	0 - 3.99	4 - 11	11.01 - 18	18.01 - 24.99	25 or higher

Lab Test History Report

The history report lists the results of your Chemistry Screen and CBC tests side by side with the latest test listed on the left hand side. This report allows you to compare results over time and see where improvement has been made and allows you to track progress.

Nutrients Rx History

Lab Test	**2025 Jul**	2025 Apr	2023 Nov
Cholesterol, Total	**191** ↑	104	205
HDL Cholesterol	**49** ↓	68	48
Triglycerides	**90** ↑	48	137
LDL Cholesterol	**126** ↑	72	76
Non HDL Cholesterol		36	100
CHOL/HDLC Ratio	**3.89** ↑	1.52	4.2
Alkaline Phosphatase	**64** ↓	68	74
C - Reactive Protein HS	**1.02** ↑	.01	0.6
Glucose	**85** ↑	82	79
Hemoglobin A1c	**5.4** ↑	5.0	4.7
Urine - Glucose	**NEGATIVE**	NEGATIVE	NEGATIVE
Urine - Ketones	**NEGATIVE**	NEGATIVE	NEGATIVE
Uric Acid	**5.4** ↑	4.2	5.0
Protein, Total	**6.4** ↓	6.8	6.9
Albumin	**4.5** ↑	4.4	4.9
Globulin	**2** ↓	2.4	2.0
Albumin/Globulin Ratio	**2.25** ↑	1.83	2.5
Testosterone, Total, Ms	**883** ↑	854	453
Testosterone, Free	**167** ↓	282	156
Testosterone, Bioavailable			224.3
PSA, Total	**5.4** ↑	0.1	1.5
Estrogens, Total	**100** ↑	62	39.5

Report For John Doe

Date July 31, 2025

Lab Test	**2025 Jul**	2025 Apr	2023 Nov
Sex Hormone Binding Globulin	**45.8** ↑	36.4	53
TSH	**3.96** ↑	0.48	2.94
Hemoglobin	**14** ↓	14.8	14.8
Hematocrit	**41.9** ↓	44.8	41.2
White Blood Cell Count	**6.9** ↑	5.6	6.2
Red Blood Cell Count	**4.4** ↓	4.8	4.50
MCV	**95** ↑	88	91.6
MCH	**31.8** ↑	30.4	30.7
MCHC	**33.4** ↑	32.6	33.5
RDW	**12.3** ↓	12.6	12.7
Platelet Count	**294** ↑	284	288
MPV			10.6
Neutrophils	**61** ↑	48	59.5
Lymphocytes	**25** ↓	28	29.3
Eosinophils	**3** ↓	6	2.3
Basophils	**1**	1	0.5
Monocytes	**10** ↑	8	8.4
Absolute Neutrophils	**4200** ↑	3600	3689000
Absolute Lymphocytes	**1900** ↓	2000	1817000
Absolute Eosinophils	**200**	200	143000
Absolute Basophils	**100**	100	31000
Absolute Monocytes	**700** ↑	400	521000
Absolute Nucleated RBC			
Calcium	**9.3** ↓	9.4	9.5
Iron, Total	**169** ↑	142	150
Iron Binding Capacity	**283** ↓	284	375
% Saturation	**60** ↑	44	40
Ferritin	**91**		

Report For John Doe

Date July 31, 2025

Lab Test	**2025 Jul**	2025 Apr	2023 Nov
Magnesium	**2.5** ↑	2.0	2.5
Carbon Dioxide (CO2)	**19** ↓	22	28
Sodium	**138** ↑	136	141
Potassium	**4** ↓	4.2	4.4
Chloride	**97** ↓	100	101
Vitamin B12	**1200** ↑	864	900
Vitamin D	**67.7** ↓	84	20
AST	**36** ↑	22	30
ALT	**29** ↑	24	35
Bilirubin	**NEGATIVE**	NEGATIVE	NEGATIVE
Bilirubin, Total	**0.8** ↑	0.2	0.4
eGFR	**46** ↓	102	121
Creatinine	**1.7** ↑	0.88	0.75
Urea Nitrogen (BUN)	**14** ↓	16	7
BUN/Creatinine Ratio	**8** ↓	18.18	9.3
Color	**YELLOW**	YELLOW	YELLOW
Appearance	**CLEAR**	CLEAR	CLEAR
Specific Gravity	**1.021** ↑	1.01	1.002
Ph	**7**	7.0	7.5
Reducing Substances			
Occult Blood	**NEGATIVE**	NEGATIVE	NEGATIVE
Protein	**NEGATIVE**	NEGATIVE	NEGATIVE
Nitrite	**NEGATIVE**	NEGATIVE	NEGATIVE
Leukocyte Esterase	**NEGATIVE**	NEGATIVE	NEGATIVE
WBC - Urinalysis	**NONE SEEN**	NONE SEEN	NONE SEEN
RBC - Urinalysis	**None seen**	None seen	NONE SEEN
Squamous Epithelial Cells		NONE SEEN	NONE SEEN
Bacteria	**NONE SEEN**	NONE SEEN	NONE SEEN

Report For John Doe **Date** July 31, 2025

Lab Test	**2025 Jul**	2025 Apr	2023 Nov
Calcium Oxalate Crystals		NONE SEEN	
Crystals			
Hyaline Cast		NONE SEEN	NONE SEEN
Casts	**NONE SEEN**	NONE SEEN	
Amorphous Sediment			
Transitional Epithelial Cells		NONE SEEN	
Renal Epithelial Cells			
Triple Phosphate Crystals			
Granular Cast			
Yeast			
Uric Acid Crystals			

Recommendations for John Doe

Your Custom Formula Includes:

Digestion - Helps break down all nutrients, helps eliminate gas, bloat, acid reflux and more.

Vitamin-Mineral - Mineral contains 24 potent whole food vitamins and patented organic minerals. There are no synthetics present.

EFA - An essential fatty acid formula geared towards cardiovascular, brain and eye health.

Fat Sugar Trim (2) - Effectively digest fats and sugars, and gives your body the nutrients it needs to metabolize them as energy, instead of being stored as fat.

Liver-Kidney - Support detoxification with nutrients like milk thistle, dandelion and barberry, proven to ensure normal clearance of toxins, as well as protect the liver.

Opti-T - Contains a blend of specific herbs and nutrients that naturally support higher testosterone levels, reproductive health, and aid circulation.

Additional Recommendations

Improve daily lifestyle habits

We highly recommend participating in our 21-Day Jump-Start nutrition program that can be found on the last few pages of the Nutrition 101 book provided. This program will jump-start your healthy lifestyle by helping you easily change your unhealthy habits and cravings. We also recommend exercising for 30 minutes at a minimum of three days per week. If you need a coach to set up your exercise plan and help to hold you accountable, we have professionally certified trainers to help. Just contact us at support@optimalhealthsystems.com and ask for a FREE consultation with an Optimal Health Trainer.

Buy

Optimal Fruit Veggie Plus

After evaluating your results, we found that you need to consume more antioxidants and phytonutrients by increasing your daily fruit and vegetable intake. Please take 1 serving of our Optimal Fruit & Veggie Plus powder if having at least 10 servings of fruits and vegetables will be a difficult change. It's blend of ingredients contains over 14 raw fruits and vegetables, 10 organic juices, and 14 herbs and extract per serving, and is backed by 9 government-approved claims. No other fruit or green drink can make such a difference.

Buy

Optimal Muscle RX

After evaluating your results, it was determined that one of your main goals is to increase your muscle strength and size. We highly recommend adding a range of research-proven, ergogenic nutrients to your daily supplement protocol by supplementing with 5 capsules of our Optimal Muscle Rx both before and after your workout, or morning and night on rest days. This patented formula is research-proven to effectively increase muscle strength and size when combined with regular exercise.

Buy

Take Chemzyme

We recommend that you take Chemzyme to reduce any Plastics & Phthalates that you may have in your blood. Chemzyme helps to detoxify these harmful compounds, allowing your body to fully benefit from the nutrition you eat.

Buy

Or to add these to your subscription, contact us at:

support@optimalhealthsystems.com

Questionnaire

Name	John Doe
Birthday	1999-01-01
Gender	M
Height	6 3"
Weight	165 lbs
Why are you interested in knowing your exact nutrient needs?	I'm an athlete or competitor looking to improve my fitness.
Do you follow any of the following eating plans?	Intermittent Fasting
Do you have any allergies or do you try to avoid any of the following?	Latex
On an average day, you eat fruit and vegetables: one serving is approximately fist-sized	Rarely
On an average day, you eat calcium-rich foods: eg. dairy products, beans, green leafy vegetables, broccoli, almonds, etc. one serving is approximately fist-sized	More than 3 servings
On an average day, you eat lean protein: eg. fish, chicken, turkey, plant-based protein, etc. one serving is approximately 3oz	3 or more times
In an average week, how many alcoholic beverages?	0 - 1
Do you smoke or encounter second-hand smoke weekly?	No
Do you get less than 20 minutes of daily sun exposure?	No
How are your hair, skin, and nails?	Could use some help
How much time do you spend looking at screens?	A few hours a day
Do you have any of the following skin issues?	Eczema
Do you experience any of the following?	None
On average, how are your energy levels?	Pretty good
How's your mood?	Not too bad
Are you experiencing a lot of stress?	No
How do you sleep?	My mind races when I'm trying to sleep
Has anyone in your immediate family had any of these conditions?	Prostate Cancer

Have you taken antibiotics within the last 6 months?	No
Do you have any digestive issues?	SIBO
Do you struggle with any of these?	Asthma
Which best describes your fitness or activity level?	I sometimes workout
How often do you do cardio each week?	Less than 2 hours
Are you trying to increase strength & muscle size?	Yes
Do you experience joint or tendon pain?	I have tendonitis
Do you have any of the following conditions related to your eye, nose, and gum health?	None
How often do you feel sick?	2-3 times per year
Are you exposed to toxic chemicals daily? Such as a hair salon, mechanic or any place you may inhale toxic chemicals	No
Do you have any conditions related to heart health?	Congestive Heart Failure
Do you have any conditions related to kidney and bladder health?	None
Do you have any conditions related to blood sugar and endocrine health?	None
Do you have any of these conditions?	None

Lab Work Range Report

Nutrients Rx

Cholesterol, Total

191 Functional High

Your result for this lab test is in the FUNCTIONAL HIGH range. This test measures the total level of Cholesterol in your body. Cholesterol circulates in your blood in different fractions or particles called lipoproteins, and these particles are usually referred to as HDL, LDL and VLDL. The sum total of HDL, LDL, and VLDL will equal your Total Cholesterol. Cholesterol is often communicated as a bad thing, and we are given the impression that we always need to get Cholesterol to a lower number to be healthy. The reality is that Cholesterol is needed to be healthy and it is essential for life. What many people don't know is that in the original research on Cholesterol completed decades ago the researchers found that not only does high Cholesterol have a negative impact on health . . . mainly to your heart and cardiovascular system, but they also found that having low Cholesterol levels has its own unique set of consequences. Specifically, those people with low Cholesterol levels have an increased risk of developing cancer or other serious health problems over time. It will help you to understand some of the functions of cholesterol within your body. Cholesterol is part of the cell membrane (the outer layer of the cell) for all the cells in your body, so Cholesterol is necessary for healthy cells. About 60% of your brain is made up of fat and Cholesterol, so having enough Cholesterol is needed for a healthy brain and nervous system. Cholesterol is a precursor of what gets converted into many of the different hormones in your body . . . including the male and female hormones and adrenal hormones, so Cholesterol is needed for healthy hormone levels. Cholesterol is even a pretty good antioxidant . . . which means that it has the ability to protect your cells from getting damaged, and when your cells do get damaged Cholesterol can come to the rescue and help repair that cell damage. About 70% - 80% of the Cholesterol in your body is manufactured from within your own body . . . mostly by your liver. The remaining Cholesterol comes from your diet. So if Cholesterol is high it's less likely due to dietary intake, and more likely because your liver is producing more Cholesterol because the body is sensing it needs more to improve the health of your cells, nervous system and hormones, or your body is in need of more antioxidants so your liver produces more Cholesterol for the antioxidant benefit it offers. It also means that if Cholesterol is too low it could indicate a person has an underactive or hypo- liver function since the liver produces the majority of cholesterol found in the body. The most reliable method for testing Cholesterol is after doing a 12 hour fasting . . . meaning there is no eating or drinking (except water) . . . for 12 hours prior to your blood draw. If the Cholesterol is high and a person did NOT do a proper 12 hour fasting . . . then this lab result is invalid and this should be re-tested if there are concerns about Cholesterol values. When the Total Cholesterol is in the Functional Low range we will first consider if a person is on some type of Cholesterol lowering medication. If on a medication the patient may want to speak with their prescribing doctor to ask about reducing the dose or making some change to the medication . . . especially while making a serious effort to improve diet, lifestyle and using nutritional therapies to balance your body chemistry. Other factors that can contribute to a low Total Cholesterol include: 1) underactive or hypo-liver function or other problem affecting the liver, 2) overactive or hyper-thyroid function or a thyroid medication dose that is too high, 3) poor nutrition and/or very low fat intake, 4) a vegetarian or vegan diet, 5) poor absorption due to a digestive problem, or 6) overactive or hyper-adrenal function. It should be noted that a sudden drop in Total Cholesterol should alert one to some type of pathology or inflammatory condition, and this would be confirmed with other lab tests being out of range

HDL Cholesterol

49 Functional Low

Your result for this lab test is in the FUNCTIONAL LOW range. HDL refers to a form of cholesterol called High Density Lipoprotein. In order for Cholesterol to travel through your bloodstream it needs to be carried and transported by a particle called a lipoprotein, and HDL is one of these lipoprotein particles. You will often hear of this as the “good cholesterol”, because these HDL particles have the ability to clean out deposits that can build-up in your arteries and HDL may prevent the build-up of plaque that can damage your blood vessels. Having your HDL levels high enough will help to protect and improve the health of your blood vessels and can be a positive factor in preventing cardiovascular problems including heart attack and stroke. The best ways we know of to naturally improve or maintain healthy levels of HDL is through regular exercise, consuming enough Omega 3 Essential Fatty Acids (EFA), maintaining healthy blood sugar levels, and keeping your body at a healthy weight. When HDL Cholesterol is in the Clinical Low range there are several factors to consider to include: 1) Omega 3 EFA deficiency, 2) blood sugar issues or insulin resistance, 3) a problem affecting the liver, 4) a diet that is too high in sugar and carbohydrates, 5) overactive or hyper-thyroid function, 6) a lifestyle that is too sedentary / too little exercise, and 7) the effect of some medications.

Triglycerides

90 Optimal

Your result for this lab test is in the OPTIMAL range. This test measures the total level of Triglycerides in your body. A Triglyceride is a substance that has sugar and fat combined together. The sugar and fatty acid portions of a Triglyceride are part of what your cells use as a fuel source for the energy they need to function. Triglycerides also get incorporated into your fat cells and become part of your storage of body fat. Abnormal Triglyceride levels will often reflect dietary intake of fat and carbohydrates, as well as poor blood sugar control, and can have a significant impact on cardiovascular health. The most reliable method for testing Triglycerides is after doing a 12 hour fasting . . . meaning there is no eating or drinking (except water) . . . for 12 hours prior to your blood draw. If Triglycerides are high and a person did NOT do a proper 12 hour fasting . . . then this lab result is invalid and this should be re-tested if there are concerns about Triglyceride levels. When Triglycerides are in the Functional Low range there are several factors to consider including: 1) underactive or hypo-liver function or other problem affecting the liver, 2) overactive or hyper-thyroid function or a thyroid medication dose that is too high, 3) poor nutrition and/or very low fat intake, 4) vegetarian or vegan diet, 5) poor absorption due to a digestive problem, 6) overactive or hyper-adrenal function, 7) a possible autoimmune condition - especially when seen with a high HDL at >80, and 8) the effect of some medications.

LDL Cholesterol

126 Clinical High

Your result for this lab test is in the CLINICAL HIGH range. LDL refers to Low Density Lipoprotein. Because fat and water would normally want to separate from each other . . . we need a method of transporting fats through the water of our blood. A lipoprotein is a particle that helps to transport fats such as cholesterol and triglycerides through your bloodstream. LDL carries mostly cholesterol in your bloodstream bringing it to your cells and tissues because it is needed for many important functions. LDL is often called the “bad cholesterol” because excess amounts can result in cholesterol getting deposited in the walls of your blood vessels leading to hardening of the arteries and cardiovascular problems including heart attack and stroke. LDL (the bad

cholesterol) has an inverse relationship with HDL (the good cholesterol) . . . meaning that as LDL increases HDL will often decrease. Many of the same things that will raise the good cholesterol (HDL) will also lower the bad cholesterol (LDL). When LDL Cholesterol is in the Functional High range there are many factors to consider to include: 1) Omega 3 EFA deficiency, 2) blood sugar issues or insulin resistance, 3) a problem affecting the liver, 4) a diet that is too high in sugar, carbohydrates, and saturated fats 5) underactive or hypo-thyroid function, 6) a lifestyle that is too sedentary / too little exercise, and 7) the effect of some medications.

Non HDL Cholesterol

CHOL/HDLC Ratio

3.89 Functional High

Your result for this lab test is in the FUNCTIONAL HIGH range. The Total Cholesterol/HDL Ratio simply compares the amount of Cholesterol to the amount of HDL (good cholesterol) and gives you a ratio or number. This ratio is a common way to determine your future risk of cardiovascular problems based on Cholesterol (or lipid) values. A higher ratio or number can mean an increased risk for cardiovascular problems, and a lower number can mean that you have a lower risk of cardiovascular problems.

Alkaline Phosphatase

64 Functional Low

Your result for this lab test is in the FUNCTIONAL LOW range. Alkaline Phosphatase is a group of enzymes that originate from several tissues in the body to include: bone, liver, intestines and placenta. The highest concentrations are found within the bone and liver. Therefore it can be used as an indicator of a problem with these areas when Alkaline Phosphatase is higher than optimal. It is common to see Alkaline Phosphatase elevated in bone fractures that are healing and in teens when their bones are growing . . . this is considered normal due to the increase in bone activity.

When Alkaline Phosphatase is in the Functional Low range we must first consider if there is a possible zinc deficiency within the body. The Alkaline Phosphatase enzyme is zinc-dependent … meaning it requires enough zinc in the body in order for the enzyme to be created … so a low result for this lab test can be a good indicator of a zinc deficiency. Other factors that can contribute to a low Alkaline Phosphatase include: 1) underactive or hypo-thyroid function, 2) underactive or hypo-adrenal function, 3) estrogen intake, and 4) some type of anemia.

C - Reactive Protein HS

1.02 Functional High

Your result for this lab test is in the FUNCTIONAL HIGH range. C-Reactive Protein is produced by the liver and it is released into the bloodstream with inflammation, infection and injury of tissues. It is most often used as a measure of inflammation within the body that tends to be more recent or more acute. The “Cardiac” portion of this lab test name refers the High Sensitivity version of this lab test. This means we are trying to detect smaller levels of this protein due to inflammation which has also been shown to be a risk factor for

cardiovascular problems, and its ability to predict the risk of a future cardiovascular event such as heart attack and stroke. However, the inflammation may be located anywhere in the body and is not specific to only the cardiovascular system. Inflammation has the nickname of the “silent killer” because inflammation often precedes many of the chronic diseases that people suffer with when they get older. Identifying inflammation now and getting it under control could very well help to prevent a health problem later in life, or at the very least help to reduce the severity of a future health problem.

Glucose

85 Optimal

Your result for this lab test is in the OPTIMAL range. Serum Glucose is a measurement to see how well your body is controlling your blood sugar levels over a shorter period of time - about the past 12 - 24 hours. Glucose is the preferred source of fuel for all the cells in your body. It is also the most important source of fuel for your brain and nervous system which has the greatest need for healthy Glucose levels because it alone consumes about 50% of the glucose in your body. Your Glucose can vary quite a bit even within the same day based on what you are eating and drinking. The most reliable method for testing Serum Glucose is after doing a 12 hour fasting meaning there is no eating or drinking (except water) for 12 hours prior to your blood draw.

Hemoglobin A1c

5.4 Optimal

Your result for this lab test is in the OPTIMAL range. Hemoglobin A1c is a measurement to see how well your body is controlling your blood sugar levels (or glucose) over a longer period of time - about the past 2 to 3 months. As glucose circulates in the blood, some of it binds to hemoglobin. Hemoglobin is part of your red blood cells and it is responsible for transporting oxygen throughout your body. Once glucose binds to hemoglobin it will remain there for the life of the red blood cell - which is about 120 days. This makes it a good measurement of what’s been happening with your blood sugar levels over a longer period of time . . . in this case the past 2 to 3 months.

Urine - Glucose

NEGATIVE Optimal

Your result for this lab test is in the OPTIMAL range.

Glucose in urine is a type of sugar found in the urine of a person that is an indicator of how much glucose is in their blood. This is a common test given in a standard doctor's visit and is used to diagnose the presence of diabetes and other glucose-related health issues. The glucose found in the urine is the same type of sugar found in the blood and is used to measure the amount of glucose present in the body.

Having optimal Glucose in the urine is the best for your health. Optimal glucose levels in the urine indicate that the body is efficiently metabolizing glucose, which can help prevent or delay the onset of diabetes. Healthy glucose levels in the urine can also help reduce the risk of developing other metabolic disorders such as kidney disease, heart disease, and stroke. Additionally, optimal glucose levels in the urine can help prevent complications from diabetes and help people manage their blood sugar levels more effectively.

Urine - Ketones

NEGATIVE Optimal

Your result for this lab test is in the OPTIMAL range.

Ketones in urine is a measure of the body's production of ketone bodies, which are byproducts of fat metabolism. It is used to determine whether the body is in a state of ketosis, which is a process that occurs when there is not enough glucose available for energy and the body begins to burn fat for energy instead. This process can happen when a person is fasting, exercising or consuming a low-carb diet.

Having optimal Ketones in the urine is beneficial for health as it indicates that the body is in a state of ketosis. This means that it is burning fat for energy, which can lead to weight loss and improved blood sugar control. Ketones can also provide an alternative source of energy for the brain, helping to improve cognitive performance. Additionally, having optimal Ketones can help to reduce inflammation and decrease the risk of heart disease.

Uric Acid

5.4 Optimal

Your result for this test is in the Optimal range. Uric Acid is created in the body as a by- product of protein metabolism, or increased destruction of cells within your body. Uric Acid is removed from the body mostly by your kidneys, and this makes Uric Acid an indicator of how your kidneys are functioning.

Protein, Total

6.4 Functional Low

Your result for this lab test is in the FUNCTIONAL LOW range. Protein is an important building block for all the cells and tissues in your body. Protein is needed for the growth and repair of tissue, and makes up an important part of the structure of your organs, enzymes and hormones within your body. Total Protein is a measure of the two classes of proteins found within the blood called Albumin and Globulin. Albumin makes up about 60% of the Total protein, and Globulin makes up about 40%. It is important to consider the individual lab tests for Albumin and Globulin when evaluating Total Protein levels. Total Protein can be a good general indicator for liver function, kidney function and digestive problems.

When Total Protein is in a Functional Low range we must first consider if a person is not eating enough protein. Other factors that may contribute to low Total Protein include: 1) low stomach acid or low digestive enzymes, 2) digestive inflammation or other digestive problem resulting in poor absorption, 3) a liver/gall bladder problem, 4) overactive or hyper-adrenal function, 5) a problem affecting the kidneys, or 6) other hormone problem.

Albumin

4.5 Optimal

Your result for this lab test is in the OPTIMAL range. Albumin is a major protein found in the blood, and it is produced almost entirely within the liver. This makes Albumin a good indicator of liver function. You can think

of Albumin as a “carrier protein” that helps to transport and deliver nutrients, hormones and other resources to the cells of your body so your cells can function at their best. When Albumin levels drop too low this is an indicator of poor health and possibly serious disease, because the cells of your body are no longer getting a good delivery of the important resources they need to function well due to the low Albumin levels.

Globulin

2 Functional Low

Your result for this lab test is in the FUNCTIONAL LOW range. Globulin is a term for all proteins in the blood that are not Albumin. Globulins are another type of “carrier protein” involved in the transport of some resources to your cells to help them function at their best. There are 4 fractions (or types) of Globulins in the blood that make up your number for Total Globulin. These 4 fractions are called: Alpha 1, Alpha 2, Beta and Gamma. Globulins are also an important part of your immune system and are critical in the formation of antibodies - also called immunoglobulins such as IgA, IgE, IgG and IgM - which are manufactured from the gamma fraction. The gamma fraction usually makes up the largest portion of the Total Globulin, so an abnormal Total Globulin would have us first thinking about some type of acute or chronic challenge to the immune system . . . but may be due to other factors as well. When Total Globulin is close to or within the Clinical High or Clinical Low ranges, an additional test called a serum protein electrophoresis should be considered to determine which fraction(s) are involved to allow for a better diagnosis.

When Total Globulin is in the Functional Low range we must first consider an immune system that has been worn down due to some type of chronic infection or other immune challenge. Other factors that may contribute to a low Total Globulin include: 1) an inflammatory problem, 2) a liver problem, or 3) anemia.

Albumin/Globulin Ratio

2.25 Functional High

Your result for this lab test is in the FUNCTIONAL HIGH range. The A/G Ratio compares the level of Albumin to the level of Globulin. Factors that affect Albumin and Globulin will then affect the A/G Ratio. An A/G Ratio in the Clinical High or Clinical Low ranges will create a much greater concern for a developing or ongoing disease process within the body. Other factors that may contribute to a Functional High A/G Ratio include: 1) dehydration, 2) underactive or hypo-thyroid function, or 3) underactive or hypo-adrenal function.

Testosterone, Total, Ms

883 Clinical High

Your result for this lab test is in the CLINICAL HIGH range. Testosterone is the main sex hormone in men, and it is responsible for male physical characteristics. Although it is considered to be a "male" sex hormone, it is present in the blood of both men and women. Testosterone is mainly produced by special endocrine tissue (the Leydig cells) in the male testicles. It is also produced by the adrenal glands in both men and women, and by the ovaries in small amounts in women.

Testosterone levels are diurnal, peaking in the early morning hours (about 4:00 to 8:00 am), with the lowest levels in the evening (about 4:00 to 8:00 pm). Levels also increase after exercise and also decrease with age. Testosterone exists in your body in an active form called the “Free” form, and in an inactive form where

Testosterone is not available for use by your body because it is bound to a protein. This lab test measures the total amount of Testosterone in your body in BOTH the active and inactive forms.

When Total Testosterone is in the Clinical High range we must first determine if this is due to an overexposure to the hormone from an external source, or from an overproduction of the hormone inside the body. Exposure to Testosterone from an external source could include: 1) someone who is on a Testosterone hormone therapy as prescribed by a medical provider; 2) being in close physical contact with someone who is using a Testosterone lotion, gel or cream as part of a prescribed hormone therapy resulting in the hormone being absorbed into the skin of a second individual unintentionally; 3) the intentional intake of Testosterone as a steroid hormone for muscle building, performance enhancement, or other reasons. An abnormal overproduction of Testosterone from within the body could include testicular tumors, adrenal tumors that are producing testosterone, or pituitary tumors that are causing an overproduction of Luteinizing Hormone (LH) which signal the testicles (in men) to produce Testosterone. A Clinical High level of Testosterone is abnormal and should be evaluated by a qualified healthcare provider to determine the origin of the problem if the cause is unknown to the patient.

Testosterone, Free

167 Optimal

Testosterone, Free Your result for this lab test is in the OPTIMAL range. Testosterone is the main sex hormone in men, and it is responsible for male physical characteristics. Although it is considered to be a "male" sex hormone, it is present in the blood of both men and women. Testosterone is mainly produced by special endocrine tissue (the Leydig cells) in the male testicles. It is also produced by the adrenal glands in both men and women, and by the ovaries in small amounts in women. Testosterone levels are diurnal, peaking in the early morning hours (about 4:00 to 8:00 am), with the lowest levels in the evening (about 4:00 to 8:00 pm). Levels also increase after exercise and also decrease with age. Testosterone exists in your body in an active form called the “Free” form, and in an inactive form where Testosterone is not available for use by your body because it is bound to a protein. This lab test measures the total amount of Testosterone in ONLY the free or active form.

Testosterone, Bioavailable

PSA, Total

5.4 Functional High

Your result for this lab test is in the FUNCTIONAL HIGH range.

PSA, Total measures the levels of prostate-specific antigen (PSA) in the blood. PSA is a protein produced by the prostate gland, and elevated levels may indicate the presence of prostate cancer or other prostate-related conditions. This test is important for monitoring prostate health and detecting potential issues early on. Regular PSA screenings can help in the early detection and treatment of prostate cancer, improving the chances of successful outcomes.

In a holistic doctor tone, it is concerning if your blood test for PSA, Total shows high levels, as it may indicate potential issues with your prostate health. It's important to remember that high PSA levels do not necessarily mean you have cancer, as other noncancerous conditions can also cause elevated PSA levels. However, it is crucial to further investigate the cause of the elevated levels through additional tests and evaluations, such as a digital rectal exam and a prostate biopsy. Taking a holistic approach to your healthcare, it is advisable to consult with a healthcare professional specializing in holistic and integrative medicine to explore the potential causes and discuss appropriate treatment options tailored to your specific needs. Such an approach may involve dietary and lifestyle modifications, natural supplements, and mind-body techniques to support prostate health and overall well-being.

Estrogens, Total

100 Optimal

Your result for this lab test is in the OPTIMAL range. Estrogen is released by the gonads, adrenal glands, and placenta. The measurement of total estrogens provides a comprehensive evaluation of estrogen levels in both men and women.

Levels fluctuate based on cycle.

	Male (pg/mL)	Female (pg/mL)	
Prepubertal	40	40	
Adult	56-213	1 to 10d	16-328
		11 to 20d	34-501
		21 to 30d	40-244
		Post-menopausal	40-244

Sex Hormone Binding Globulin

45.8 Functional Low

Your result for this lab test is in the FUNCTIONAL LOW range.

Sex Hormone Binding Globulin (SHBG) is a protein that is produced by the liver and is found in the blood. It binds to the hormones testosterone and estradiol, preventing them from being used by the body. This is important for both males and females because it helps regulate the levels of these hormones in the bloodstream. By doing this, it helps to maintain the proper balance of hormones in the body, which is essential for good health.

Having low SHBG in the blood can have a significant impact on health for both males and females. In males, it can lead to increased acne, increased body hair, and a decrease in muscle mass. In females, it can lead to

heavy menstrual bleeding, infertility, and an increased risk of developing breast cancer. Low SHBG levels can also be a sign of metabolic syndrome, thyroid disorders, and other endocrine disorders. Therefore, it is important to maintain healthy levels of SHBG in the body to ensure optimal health.

TSH

3.96 Functional High

Your result for this lab test is in the FUNCTIONAL HIGH range. TSH refers to Thyroid Stimulating Hormone and it is with this hormone that the brain (or more specifically a part of the brain called the pituitary) is able to control the thyroid gland and the production of thyroid hormone. Thyroid hormone plays a major role in controlling your metabolism and energy production. If the brain senses too little thyroid hormone in the body then TSH will increase to tell the thyroid to produce more hormone. If the brain senses there is too much thyroid hormone in the body then TSH will decrease as a way of telling the thyroid to produce less hormone. TSH is the most common lab test performed by doctors to measure thyroid function. However, too many health providers rely on this test as the only measure of thyroid function, and this can be very misleading. The TSH lab result can be in the labs normal range and a person can still have altered thyroid function as determined by other thyroid lab tests. This overreliance on TSH as a primary indicator of thyroid function has resulted in millions of people not getting properly diagnosed with a real thyroid problem. A more comprehensive testing of thyroid function should be performed to have greater confidence that the thyroid gland is truly working at an optimal level . . . especially when a person is struggling with several symptoms of poor thyroid function. The thyroid has the nickname of the “great mimicker” because poor thyroid function can cause many symptoms and mimic many other health conditions. Some people go from one doctor to another trying to find out what is causing their symptoms . . . only to find out that their poor thyroid function is playing a major role in their health problems. Symptoms of underactive or hypo-thyroid function can include: fatigue, weight gain, soreness in muscles and joints, headaches, depression, constipation, slow metabolism, hair falling out, dry skin, intolerance to cold, menstrual changes in women, and more. Symptoms of overactive or hyper-thyroid function can include: sudden weight loss, anxiety and nervousness, rapid heartbeat, hands and fingers trembling, increased sweating, enlarged thyroid gland / swelling of the neck, difficulty sleeping, and more. Because poor thyroid function can affect many metabolic functions within the body, and can alter many lab results (not just the ones testing thyroid directly) . . . improving thyroid function becomes a higher "priority" when it’s discovered that it’s not functioning at an optimal level. When the TSH is in the Functional High range this will indicate a pre-hypothyroid condition. Meaning that it does not meet the clinical definition of hypothyroidism, but a person may still be experiencing symptoms and the effects of lowered thyroid function. Instead of waiting for the problem to get worse . . . which could take many years and a slow decline of health over those years . . . It would be much more beneficial to take action now to bring thyroid function back to optimal. It will always help to compare this with other thyroid lab tests to confirm changes in thyroid function. Factors that can contribute to TSH in the Functional High range may include: 1) a liver problem as the liver is highly involved in converting thyroid hormone into its most biologically active form called T3, 2) a pituitary problem as the pituitary produces TSH to control the thyroid gland, 3) a hypothalamus problem as the hypothalamus controls the pituitary and this is really the beginning of the hormonal communication within the body, 4) other hormone imbalance such as excess estrogen (estrogen dominance) affecting thyroid function, 5) chemicals or toxic heavy metals in the body disrupting thyroid function, 6) nutrient deficiencies such as iodine and selenium that can affect thyroid function, and 7) the effect of some medications - including taking a taking a thyroid medication dose that is a little too low for your body if on thyroid medication.

Hemoglobin

14 Functional Low

Your result for this lab test is in the FUNCTIONAL LOW range. This test measures the amount of hemoglobin in a blood sample. Hemoglobin is a protein that contains iron, and this is what gives your blood its red color. Hemoglobin is an important part of your Red Blood Cells that allows you to pick-up oxygen from your lungs and transports that oxygen to all the cells of your body. It also helps transport carbon dioxide from your cells back to the lungs to be removed from your body when you exhale during breathing. When Hemoglobin is in the Functional Low range we will first need to remember that anything that causes the Red Blood Cell count to decrease will result in a decrease of Hemoglobin within the blood. With Hemoglobin in the Functional Low range we will consider that person as having an “anemic tendency” or pre-anemic. Meaning they do not necessarily meet the clinical definition of Anemia, but because their Hemoglobin is lower than optimal they may be moving in the direction of becoming anemic. As Hemoglobin is moving closer to the clinical low range we will consider the many reasons for lower than optimal Hemoglobin more seriously to include: 1) a deficiency of one or more nutrients that are critical for healthy Red Blood Cells such as Iron, Vitamin B12, Vitamin B6, Folic Acid, Vitamin C and the mineral Copper, 2) a loss of blood due to bleeding from some type of trauma or injury, a bleeding processing within the digestive system such as an ulcer or colon cancer, a severe bladder or kidney infection resulting in blood loss through the urine, or heavy menstrual bleeding in women, 3) the Red Blood Cells are getting destroyed due to some type of auto-immune condition or other disease process, 4) a possible liver or kidney problem, 5) the effect of some medications. If Hemoglobin continues to decline on follow-up lab testing then we may need to consult with a blood specialist in order to determine the cause of Anemia.

Hematocrit

41.9 Optimal

Your result for this lab test is in the OPTIMAL range. Hematocrit is simply measuring the percentage of your blood that is only Red Blood Cells, and reflects both the number of Red Blood Cells and the size or volume of the Red Blood Cells - with the size or volume measured as MCV (mean corpuscular volume) in blood testing. Understand that your blood is made up of both liquid and solid particles. The liquid is referred to as plasma, and the solid particles are things like Red Blood Cells, White Blood Cells, Platelets, and more. Hematocrit is telling us what percentage of a blood sample is purely Red Blood Cells. Hematocrit will usually travel in the same direction of the RBC count, unless the individual Red Blood Cells are smaller or larger than normal in size or volume.

White Blood Cell Count

6.9 Optimal

Your result for this test is in the Optimal range. White blood cells, also called leukocytes, are cells that exist in the blood, the lymphatic system, and tissues and are an important part of the body's defense system. They help protect against infections and also have a role in inflammation, and allergic reactions. The white blood cell (WBC) count totals the number of white blood cells in a sample of your blood. It is one test among several that is included in a complete blood count (CBC), which is often used in the general evaluation of your health.

Blood is made up of three main types of cells suspended in fluid called plasma. In addition to WBCs, there are red blood cells and platelets. All of these cells are made in the bone marrow and are released into the

blood to circulate.

There are five types of WBCs, and each has a different function:

- Three types of WBCs are referred to as granulocytes because of the granules present in their cytoplasm. These granules release chemicals and other substances as part of the immune response. Granulocytes include:
- Neutrophils (neu) normally make up the largest number of circulating WBCs. They move into an area of damaged or infected tissue, where they engulf and destroy bacteria or sometimes fungi.
- Eosinophils (eos) respond to infections caused by parasites, play a role in allergic reactions (hypersensitivities), and control the extent of immune responses and inflammation.
- Basophils (baso) usually make up the fewest number of circulating WBCs and are thought to be involved in allergic reactions.
- Lymphocytes (lymphs) exist in both the blood and the lymphatic system. They are divided into three types:
- B lymphocytes (B cells) produce antibodies as part of the body's natural defense (immune) responses.
- T lymphocytes (T cells) recognize foreign substances and process them for removal.
- Natural killer cells (NK cells) directly attack and kill abnormal cells such as cancer cells or those infected with a virus.
- Monocytes (mono), similar to neutrophils, move to an area of infection and engulf and destroy bacteria. They are associated more often with chronic rather than acute infections.

When there is an infection or an inflammatory process somewhere in the body, the bone marrow produces more WBCs, releasing them into the blood, and through a complex process, they move to the site of infection or inflammation. As the condition resolves, the production of WBCs by the bone marrow subsides and the number of WBCs drops to normal levels again.

In addition to infections and inflammation, there are a number of conditions that can affect the production of WBCs by the bone marrow or the survival of WBCs in the blood, such as cancer or an immune disorder, resulting in either increased or decreased numbers of WBCs in the blood. The WBC count, along with the other components of the CBC, alerts a healthcare practitioner to possible health issues. Results are often interpreted in conjunction with additional tests, such as a WBC differential and a blood smear review. A differential may provide information on which type of WBC may be low or high, and a blood smear may show the presence of abnormal and/or immature WBCs.

Red Blood Cell Count

4.4 Optimal

Your result for this test is in the Optimal range. Red blood cells (RBCs), also called erythrocytes, are cells that circulate in the blood and carry oxygen throughout the body. The RBC count totals the number of red blood cells that are present in your sample of blood. It is one test among several that is included in a complete blood count (CBC) and is often used in the general evaluation of a person's health. Blood is made up of a few different types of cells suspended in fluid called plasma. In addition to RBCs, there are white blood cells (WBCs) and platelets. These cells are produced in the bone marrow and are released into the bloodstream as they mature. RBCs typically make up about 40% of the blood volume. RBCs contain hemoglobin, a protein that binds to oxygen and enables RBCs to carry oxygen from the lungs to the tissues and organs of the body.

RBCs also help transport a small portion of carbon dioxide, a waste product of cell metabolism, from those tissues and organs back to the lungs, where it is expelled. The typical lifespan of an RBC is 120 days. Thus the bone marrow must continually produce new RBCs to replace those that age and degrade or are lost through bleeding. A number of conditions can affect RBC production and some conditions may result in significant bleeding. Other disorders may affect the lifespan of RBCs in circulation, especially if the RBCs are deformed due to an inherited or acquired defect or abnormality. These conditions may lead to a rise or drop in the RBC count. Changes in the RBC count usually mirror changes in other RBC tests, including the hematocrit and hemoglobin level. • If RBCs are lost or destroyed faster than they can be replaced, if bone marrow production is disrupted, or if the RBCs produced do not function normally, or do not contain enough hemoglobin, then you may develop anemia, which affects the amount of oxygen reaching tissues. • If too many RBCs are produced and released, then you can develop polycythemia. This can cause thicker blood, decreased blood flow and related problems, such as headache, dizziness, problems with vision, and even excessive clotting or heart attack.

MCV

95 Optimal

Your result for this lab test is in the OPTIMAL range. MCV refers to the Mean Corpuscular Volume, or the average size or volume of the Red Blood Cells. When anemia is present the MCV, along with other measurements on the health of your Red Blood Cells, may help to determine the type of anemia.

MCH

31.8 Optimal

Your result for this lab test is in the OPTIMAL range. MCH refers to the Mean Corpuscular Hemoglobin, or the average weight or mass of hemoglobin inside a Red Blood Cell. This measurement is calculated by taking the total mass of hemoglobin and dividing this by the number of Red Blood Cells in a volume of blood. When a person has anemia . . . the MCH can be useful for determining the type of anemia.

MCHC

33.4 Optimal

Your result for this lab test is in the OPTIMAL range. MCHC refers to Mean Corpuscular Hemoglobin Concentration, or how much of the Red Blood Cell is occupied by Hemoglobin. This measurement is most helpful to evaluate if a person’s treatment for anemia is working and their anemia is improving.

RDW

12.3 Optimal

Your result for this lab test is in the OPTIMAL range. RDW refers to Red Blood Cell Distribution Width, and this test measures if there is an abnormal variation in the size or width of your Red Blood Cells in a blood sample. Your Red Blood Cells are normally a little larger in size when they are first created in the bone marrow and released into your blood stream. As these cells mature they decrease slightly in size and remain that way for the life of that cell - which is about 120 days. This means that your bone marrow should be constantly producing new Red Blood Cells to replace the ones that die and are removed from your blood.

Therefore, in the same blood sample we expect to see a certain variation in the width of your Red Blood Cells as new ones are replacing old ones. If something is affecting the health of your Red Blood Cells and hemoglobin, and your body is sensing that not enough oxygen is getting transported to all the cells of your body, your bone marrow will then produce and release more new Red Blood Cells into your blood as a way to get more oxygen transported to your cells. This increases the ratio of the slightly larger new Red Blood Cells versus the slightly smaller more mature Red Blood Cells. This change in the variation of Red Blood Cells size is seen as an increase in the RDW, and is most often seen with some type of anemia. The RDW is only a relevant test for those people that have anemia, and is not a helpful measurement for those that do not have anemia.

Platelet Count

294 Optimal

Your result for this lab test is in the OPTIMAL range. Platelets are essential for normal blood clotting, and this test for Platelet Count is to determine the number of Platelets in your blood sample. Platelets help to stop bleeding by adhering to the location of blood vessel damage, by clumping together to form a “platelet plug”, and by releasing chemicals that help to stimulate more Platelets to clump together. Platelets are part of a complex series of events in the body that leads to proper clotting when a person is bleeding - called a coagulation cascade. Platelets are formed in the bone marrow and have a life-span of 8 - 10 days, so the bone marrow must be constantly creating new platelets to replace the old ones and to replace ones that are lost due to bleeding.

MPV

Neutrophils

61 Optimal

Your result for this lab test is in the OPTIMAL range. Neutrophils are one type of White Blood Cell, and they usually make-up the greatest percentage of the different kinds of White Blood Cells in a normal functioning immune system that is not fighting off an infection. This test is to determine what percentage of total White Blood Cells are specifically Neutrophils. Neutrophils are primarily involved in fighting off bacterial infections. A common pattern to see in a more active or acute bacterial infection is the Neutrophils increased and the Lymphocytes decreased.

Lymphocytes

25 Optimal

Your result for this lab test is in the OPTIMAL range. Lymphs - more commonly referred to as Lymphocytes - are one type of White Blood Cell. This test is to determine what percentage of total White Blood Cells are specifically Lymphocytes. There are several kinds of Lymphocytes such as T-cells, B- cells and Natural Killer Cells, and these Lymphocytes make up the second most common type of White Blood Cell in a normal functioning immune system that is not fighting off an infection. Lymphocytes are created in the bone marrow, and then travel to other tissues such as the thymus gland and spleen to mature into their active immune cell.

Lymphocytes are primarily involved in fighting off viral infections, and they often become activated with inflammation. A common pattern to see with a viral infection is the Lymphocytes increased and the Neutrophils decreased.

Eosinophils

3 Functional High

Your result for this lab test is in the FUNCTIONAL HIGH range. Eos - more commonly referred to as Eosinophils - are one type of White Blood Cell. This test is to determine what percentage of total White Blood Cells are specifically Eosinophils. Eosinophils are more often involved in parasite infections and environmental or food allergies and sensitivities. They have the ability to consume and remove broken-down particles of protein - to include the remains of invading organisms after an immune system attack and antibody complexes that get created from an allergic reaction - both of which have different kinds of proteins that make up their structure.

When Eosinophils are in the Functional High range we will need to consider many reasons to include: 1) a parasite infection - often combined with elevated Monocytes, 2) an allergic response to foods or environmental factors, 3) asthma or other respiratory issues, 4) underactive or hypo-adrenal function, 5) overactive or hyper-thyroid function, and 6) the effect of some medications.

Basophils

1 Optimal

Your result for this test is in the OPTIMAL range. Basophils are white blood cells from the bone marrow that play a role in keeping the immune system functioning correctly. Doctors may order basophil level tests to help diagnose certain health problems. If basophil levels are low, this may be a sign of an allergic reaction or another condition. An abnormally high basophil level is called basophilia. It can be a sign of chronic inflammation in your body. Or it can mean that a condition is causing too many white blood cells to be produced in your bone marrow.

Monocytes

10 Clinical High

Your result for this lab test is in the CLINICAL HIGH range. Monocytes are one type of White Blood Cell, and they can increase in response to a bacterial, viral or parasite infection. This test is to determine what percentage of total White Blood Cells are specifically Monocytes. Monocytes are produced in the bone marrow and then travel to tissues that are infected where they turn into a macrophage - a type of cell that consumes and removes infecting organisms, the fragments of damaged cells, and any other material left behind from an infection. It is typical to see Monocytes elevated in the final stages of an infection when the body is recovering from the infection. When Monocytes are in the Functional High range we will first consider if a person is recovering from some type of infection as it is typical for Monocytes to increase in the later stages of an infection to clean up the infected tissue. A more complete list of reasons why the Monocytes can be elevated include: 1) A bacterial or viral infection, 2) a parasite infection - often combined with elevated Eosinophils, 3) when a person has “Mono” referring to Mononucleosis caused by the Epstein-Barr virus - Mononucleosis simply refers to the presence of an abnormally large number of Monocytes in the blood, 4) an

inflammatory process in the body, 5) a possible liver problem, and 6) a possible enlarged prostate in men over the age of 40 - often combined with increased Creatinine levels and increased LDH levels - specifically the LDH isoenzyme #4.

Absolute Neutrophils

4200 Optimal

Your result for this lab test is in the OPTIMAL range. Neutrophils are one type of White Blood Cell, and they usually make-up the greatest percentage of the different kinds of White Blood Cells in a normal functioning immune system that is not fighting off an infection. This lab test is a calculation to determine the actual or absolute number of Neutrophils within a blood sample. When the total White Blood Cell count is elevated or decreased . . . looking at the absolute count of Neutrophils can be helpful in determining what type infection or challenge to the immune system is taking place. Neutrophils are primarily involved in fighting off bacterial infections. A common pattern to see in a more active or acute bacterial infection is the Neutrophils increased and the Lymphocytes decreased.

Absolute Lymphocytes

1900 Optimal

Your result for this lab test is in the OPTIMAL range. Lymphs - more commonly referred to as Lymphocytes - are one type of White Blood Cell. This lab test is a calculation to determine the actual or absolute number of Lymphocytes within a blood sample. When the total White Blood Cell count is elevated or decreased . . . looking at the absolute count of Lymphocytes can be helpful in determining what type infection or challenge to the immune system is taking place. There are several kinds of Lymphocytes such as T-cells, B-cells and Natural Killer Cells, and these Lymphocytes make up the second most common type of White Blood Cell in a normal functioning immune system that is not fighting off an infection. Lymphocytes are created in the bone marrow, and then travel to other tissues such as the thymus gland and spleen to mature into their active immune cell. Lymphocytes are primarily involved in fighting off viral infections, and they often become activated with inflammation. A common pattern to see with a viral infection is the Lymphocytes increased and the Neutrophils decreased.

Absolute Eosinophils

200 Optimal

Your result for this lab test is in the OPTIMAL range. Eos - more commonly referred to as Eosinophils - are one type of White Blood Cell. This lab test is a calculation to determine the actual or absolute number of Eosinophils within a blood sample. When the total White Blood Cell count is elevated or decreased looking at the absolute count of Eosinophils can be helpful in determining what type infection or challenge to the immune system is taking place. Eosinophils are more often involved in parasite infections and environmental or food allergies and sensitivities. They have the ability to consume and remove broken-down particles of protein - to include the remains of invading organisms after an immune system attack and antibody complexes that get created from an allergic reaction - both of which have different kinds of proteins that make up their structure.

Absolute Basophils

100 Optimal

Your result for this lab test is in the OPTIMAL range. Basos Your result for this lab test is in the OPTIMAL range. Basos - more commonly referred to as Basophils - are one type of White Blood Cell. This test is to determine what percentage of total White Blood Cells are specifically Basophils. Once Basophils enter the tissue they are then referred to as a Mast cell. Both Basophils and Mast cells contain small pockets of powerful chemicals like histamine, serotonin and heparin which alter blood supply to tissues, help prevent clotting in inflamed tissue, and help mobilize the body's immune system. Basophils can be elevated in nearly any type of inflammatory condition or immune system reaction.

Absolute Monocytes

700 Optimal

Your result for this lab test is in the OPTIMAL range. Monocytes are one type of White Blood Cell, and they can increase in response to a bacterial, viral or parasite infection. This lab test is a calculation to determine the actual or absolute number of Monocytes within a blood sample. When the total White Blood Cell count is elevated or decreased . . . looking at the absolute count of Monocytes can be helpful in determining what type infection or challenge to the immune system is taking place. Monocytes are produced in the bone marrow and then travel to tissues that are infected where they turn into a macrophage - a type of cell that consumes and removes infecting organisms, the fragments of damaged cells, and any other material left behind from an infection. It is typical to see Monocytes elevated in the final stages of an infection when the body is recovering from the infection.

Absolute Nucleated RBC

Calcium

9.3 Optimal

Your result for this lab test is in the OPTIMAL range. Calcium is the most abundant mineral in the body, and the majority of the calcium in your body is stored in your bone tissue. Therefore, most people will associate calcium with bone density and preventing osteoporosis. However, calcium is involved in many other important functions of the body including muscle function, nervous system function, heart function, your immune system, blood clotting and the repair of damaged tissues, and more. Your ability to absorb calcium is highly dependent on having enough stomach acid (HCL) available during digestion, so low stomach acid can equal poor calcium absorption. Calcium levels in your blood are most greatly controlled by your parathyroid gland . . . which is a group of 4 small glands that sit on the backside of the thyroid gland (two on each side). Calcium levels are also strongly influenced by Vitamin D which helps improve the absorption of calcium from the intestines into the blood. Calcium travels in the blood in both a freely available ionized form, and in a non-available form that is bound to other proteins - most commonly albumin. This makes it important to also look at Serum Albumin levels when interpreting Serum Calcium levels. Please note that a low Serum Calcium does not automatically mean you are in need of additional calcium or that you are at risk for lower bone density, and is not a good method for tracking osteoporosis. Other factors should also be considered when

interpreting Serum Calcium, such as magnesium levels, Vitamin D levels and how different hormones will influence calcium levels.

When Serum Calcium levels are HIGHER than optimal we must consider if a person is taking too much Vitamin D in supplement form. Sometimes those people on thyroid medications can have slightly elevated calcium levels. Calcium levels in the blood are very carefully controlled by the body, so if blood testing reveals Serum Calcium to be at very high levels then this indicates some other problem in the body - possible with the parathyroid gland - and this person will likely need to go to a specialist for more testing. When Serum Calcium levels are LOWER than optimal we know that this could be due to several factors, but it is safe to conclude that the body may be in need of more calcium.

Iron, Total

169 Functional High

Your result for this test is in the FUNCTIONAL HIGH range. Iron is an important mineral that your body needs to stay healthy. Your body uses iron to make hemoglobin, the protein in your red blood cells that carries oxygen throughout your body. If you don't have enough iron, you may not have enough hemoglobin. This condition is called iron deficiency anemia. Iron in your body is carried, or bound, mainly to a protein made by your liver called transferrin. The TIBC test is based on certain proteins, including transferrin, found in the blood. Your transferrin levels are almost always measured along with iron and TIBC. You may need these tests if your healthcare provider thinks your iron level is too low or too high. Not having enough iron in your diet is the most common cause of anemia and the most common type of diet deficiency in the U.S. Your healthcare provider may do this test to look at your diet, nutrition, liver, or other conditions that cause iron to be low, such as increased blood loss or pregnancy. Symptoms of iron deficiency include: • Being tired and feeling weak • Getting frequent infections • Feeling cold all the time • Having swelling in the tongue • Struggling to keep up at school or work • In children, having delayed mental development Symptoms of too much iron can include: • Feeling tired and weak • Joint pain • Belly pain.

Iron Binding Capacity

283 Optimal

Your result for this lab test is in the OPTIMAL range. Iron Binding Capacity (sometimes referred to as Total Iron Binding Capacity or TIBC) is a lab test to measure how much iron can bind to a protein that is responsible for transporting iron throughout the body (the protein is called transferrin). To state this more simply . . . if there is not enough iron bound to this transport protein (called transferrin) then there is a higher capacity or ability for more iron to bind and the Iron Binding Capacity will measure at a higher level. This would indicate that there may not be enough iron in the body. Conversely, if most of this transport protein is already bound to iron . . . then there is a lower capacity or ability to bind more iron and the Iron Binding Capacity will measure at a lower level. This would indicate that there may be too much iron in the body. The measurement for Iron Binding Capacity will usually travel opposite of iron levels in the body. If iron levels in the body are low, then the Iron Binding Capacity will go higher. If iron levels in the body are high, then Iron Binding Capacity will go lower.

% Saturation

60 Clinical High

Your result for this lab test is in the CLINICAL HIGH range. Iron Saturation is a measure of how much Transferrin is saturated with iron, and this is measured as a percentage. Transferrin is a carrier protein that helps to transport iron throughout the body. In a healthy individual the Iron Saturation ranges from about 20% - 40% . . . with and average around 33%. If there is not enough iron bound to this transport protein (called transferrin) then this protein is poorly saturated with iron and the Iron Saturation will be a lower percentage. This would indicate that there may not be enough iron in the body. Conversely, if this transport protein is highly saturated with iron . . . then the Iron Saturation will be at a higher percentage. This would indicate that there may be too much iron in the body. The measurement for Iron Saturation will usually travel in the same direction of iron levels in the body. If iron levels in the body are low, then the Iron Saturation will be a lower percentage. If iron levels in the body are high, then the Iron Saturation will be a higher percentage. When Iron Saturation is in the Clinical High range we must first determine if there is truly an overload or excess of iron in the body by also looking at other iron-related lab tests. Factors that can contribute to iron excess in the body include: 1) excess intake from iron containing supplements, drinking water with high levels of iron and use of iron cookware, 2) a liver problem, 3) a hereditary condition called Hemochromatosis, 4) an inflammatory process within the body, or 5) poor conversion of iron into hemoglobin due to some other nutrient deficiency - such as B6, B12 or Folic Acid.

Ferritin

91 Optimal

Your result for this lab test is in the OPTIMAL range.

Ferritin is a protein in your blood that stores iron. It's like a storage bank for iron, readily available for your body to use when it needs to make new red blood cells. Measuring ferritin levels is a common way to assess your body's iron stores.

Optimal Ferritin Levels: It indicates that you have sufficient iron stores to meet your body's needs for red blood cell production and other essential functions. You are likely not experiencing symptoms related to iron deficiency or iron overload.

What you might do: Maintain a Balanced Diet: Continue to consume a diet that includes adequate iron to maintain healthy stores.

Follow Doctor's Recommendations: If your doctor has given you any specific advice regarding iron intake, continue to follow it.

Routine Check-ups: Regular check-ups with your doctor, including blood tests as recommended, can help monitor your iron levels over time.

Magnesium

2.5 Optimal

Your result for this lab test is in the Optimal range. Magnesium is involved in hundreds of chemical and enzyme reactions within the body, and it’s one of the most common mineral deficiencies. Magnesium is needed for many functions in the body to include: energy production, sugar metabolism, hormone balance, balance of brain chemistry, memory, heart function, and most notably for proper muscle function. About half

of your magnesium is found within the soft tissues and muscles of your body, and the rest is in bone tissue. Your body needs enough magnesium for your muscles to relax properly. People who suffer with chronic muscle tightness, or even muscle cramps – such as “charlie horses” in the foot or calf muscles waking a person up from their sleep at night – are often symptoms of a magnesium deficiency. Magnesium not only affects the function of the skeletal muscles (the muscles that allow you to move your body), but it also affects the muscles that control your blood vessels. You have small muscles in your blood vessels that control how dilated (open) or contracted (closed) your blood vessels are. A magnesium deficiency could lead to tighter muscles in your blood vessels and result in them being more contracted (closed) and therefore higher blood pressure. Considering how common magnesium deficiency in our society is, this is likely to be one of many factors that contribute to High Blood Pressure. Taking magnesium may result in a decrease of chronically High Blood Pressure.

Carbon Dioxide (CO2)

19 Clinical Low

Your result for this lab test is in the CLINICAL LOW range. The Total Carbon Dioxide is actually a measure of a bicarbonate molecule, and not a measure of the CO2 gas in the blood since carbon dioxide occurs mostly in the form of a bicarbonate molecule. Bicarbonate in the blood is controlled primarily by the kidneys, and it helps to neutralize metabolic acids within the body and is important in maintaining the acid-alkaline balance of your body chemistry. Bicarbonate (or Total CO2) is usually ordered as part of an electrolyte panel to help understand if a person if suffering from an electrolyte imbalance and is a good general measure of the acid - alkaline balance of your body chemistry. When the Total Carbon Dioxide measurement is outside the optimal range we must first consider if this is due to a respiratory (lung) problem or a metabolic (body chemistry) problem.

When Total Carbon Dioxide is in the Clinical Low range it’s indicating the body chemistry is more acidic. This could be due to many factors including: 1) overconsumption of acidic foods and beverages, 2) a problem affecting the kidneys, 3) underactive or hypo-adrenal function, 4) blood sugar issues - remember that excess sugar is acidic in the body, 5) a respiratory problem that results in excess loss of CO2 through the lungs, and 6) the effect of some medications.

Sodium

138 Optimal

Your result for this lab test is in the OPTIMAL range. Sodium is an electrolyte that helps your cells to function normally and helps to regulate the amount of fluid in your body. Sodium is regulated by your kidneys and certain hormones . . . and is strongly influenced by adrenal hormone function. We get sodium in our body through our diet. Your body will use what it needs, and the kidneys will get rid of the rest in your urine to maintain sodium levels in a very narrow range within your blood. It is more common to see sodium levels too low in blood testing versus too high.

Potassium

4 Optimal

Potassium, Serum Your result for this lab test is in the OPTIMAL range. Potassium is an electrolyte that is critical to cell metabolism and muscle function . . . including the proper function of your heart muscle. Potassium also helps to regulate the amount of fluid in your body, and helps in maintaining an acid-alkaline balance within your body. Most of the potassium in your body is located inside of your cells, but we still measure potassium levels outside of your cells (in the serum) because even small changes in serum potassium can have big consequences to how your cells are functioning. Potassium is mostly regulated in your body by your kidneys and can serve as another indicator of kidney function, but potassium is also strongly influenced by adrenal hormone function and certain medications - such as diuretics.

Chloride

97 Clinical Low

Chloride Your result for this lab test is in the CLINICAL LOW range. Chloride is an electrolyte which helps to regulate the fluid in the body and to maintain the acid-alkaline balance in your body. Most chloride in your body is consumed through food and table salt (sodium chloride). Chloride levels will most often change in the same direction as sodium due to the relationship between the two. Chloride can also exert an effect on blood pressure, with some research indicating that higher chloride levels contribute to higher blood pressure. Chloride is also drawn from the blood and used in the production of stomach acid (hydrochloric acid) which is important for proper digestion of foods. When Chloride levels are in the Clinical Low range we become more concerned about how this is affecting the production of stomach acid and overall digestion. Chloride in the blood is one of the main elements needed for your stomach to produce hydrochloric acid. A low Chloride level could also be due to: 1) a body chemistry that is too alkaline, 2) underactive or hypo-adrenal function, and 3) the effect of some medications.

Vitamin B12

1200 Clinical High

Your result for this lab test is in the CLINICAL HIGH range. Here is a summary of the Function, Deficiency Symptoms and Repletion information for Vitamin B12 (Cobalamin). Vitamin B12 (Cobalamin) Function: Vitamin B12 is needed to form blood and immune cells, and support a healthy nervous system. A series of closely-related compounds known collectively as cobalamins or vitamin B12 are converted into active forms methylcobalamin or 5-deoxyadenosylcobalamin. Methylcobalamin interacts with folate metabolism, preventing folate derivatives from being trapped in unusable states. Adenosylcobalamin is involved in the metabolism of odd-chain fatty acids and branched-chain amino acids. Vitamin B12 (Cobalamin) Deficiency Symptoms: Deficiency symptoms of vitamin B12 are both hematological (pernicious anemia) and neurological. A megaloblastic anemia may occur because the effects of the vitamin B12 deficiency on folate metabolism. Shortness of breath, fatigue, weakness, irritability, sore tongue, and a decrease in blood cell counts (red, white and platelets) are all clinical signs of a vitamin B12 deficiency. Neurological symptoms are manifested as a progressive neuropathy, with loss of position sense and ataxia. If vitamin B12 repletion is not initiated, permanent neurological damage, including degeneration of nerves and spinal cord can result. Recent evidence suggests that mental symptoms of depression and fatigue are detectable before anemia develops. Vitamin B12 is necessary to prevent accumulation of homocysteine, a toxic metabolic byproduct linked to cardiovascular disease and connective tissue abnormalities. Hypochlorhydria and gastrointestinal disturbances are frequently associated with vitamin B12 deficiency. Vitamin B12 (Cobalamin) Repletion information: Dietary sources for cobalamins are strictly from animal foodstuffs. Vitamin B12 is not found in plant foodstuffs. Dietary supplements can also contain vitamin B12. The 1989 RDA for vitamin B12 is 2.0 ?g

for adults. No toxic effects of oral vitamin B12 intake have been demonstrated, even in doses over 1000 ?g daily. Some people may require more frequent or larger doses than usual before repletion occurs.

Vitamin D

67.7 Optimal

Your result for this lab test is in the OPTIMAL range. Vitamin D is one of the most heavily researched of all the individual vitamins and minerals. Although it is referred to as a vitamin . . . the active form of Vitamin D functions in many ways like a hormone in the way it communicates and controls the function of your cells. The benefits of Vitamin D include: 1) improving blood sugar control because your pancreas needs Vitamin D in the manufacture of insulin, 2) improving the balance of brain chemistry, 3) improving the balance of female and male hormones, 4) improving energy levels - some people have noticed an increase in energy after taking the proper therapeutic dose of Vitamin D3 based on the results of lab testing, 5) improved immune function - fewer colds and flu, 6) improving bone density by helping to bring digested calcium into the blood so it can then be incorporated into bone tissue, and 7) the ability to reduce an auto-immune reaction within the body.

AST

36 Clinical High

Your result for this lab test is in the CLINICAL HIGH range. AST (SGOT) refers to an enzyme called Aspartate Aminotransferase, and this test is commonly called a liver enzyme test. In reality AST is found in many organs and tissues of the body that are considered to be highly metabolic, or simply more active on a daily basis to include: liver, skeletal muscles, heart muscle, brain, kidney, pancreas and lungs . . . but this enzyme is found in the greatest quantity within the liver and heart. AST is an enzyme that will show up in the blood when there is damage or destruction of cells in these more metabolically active tissues. You may know of someone who needed to periodically get their “liver checked” while being on a medication - such as a cholesterol medication. They were most likely getting these two main liver enzymes tested (AST and ALT) as a common screening test for liver function in blood testing. Your liver has many important functions in the body including: removing chemicals and toxins from the body, it’s involved in blood sugar control, it activates the majority of thyroid hormone into its more bioactive form (T3) to improve energy and metabolism, and much more. Your liver is a very resilient organ, as you can have as little as 20% of good liver function and still have these liver enzymes test in the normal range. This means that when the AST begins to test outside the optimal range we want to take action more quickly to help improve function before any more damage happens to the liver or other affected tissues. When AST is in the Clinical High range we first think of a problem affecting the liver. The stress on the liver could be due to some type of infection or inflammation, a medication or other chemical stress, alcohol intake, or other reasons. When these liver enzymes (AST, ALT, and GGT) begin testing at or near 100 we begin to think about some type of Fatty Liver Disease. When these are testing at or over 200 we become more concerned about Hepatitis. Elevated levels of AST may require additional testing or referral to a specialist to determine the origin of liver stress. Other reasons that may result in a high AST include: 1) some type of heart problem or coronary artery problem, 2) a gall bladder problem, 3) a pancreas problem, 4) a condition resulting in muscle tissue breakdown, 5) some types of anemia or 6) a recent viral infection. If AST is elevated much higher than ALT we then begin to think more about some type of heart or skeletal muscle problem.

ALT

29 Clinical High

Your result for this lab test is in the CLINICAL HIGH range. ALT (SGPT) refers to an enzyme called Alanine Aminotransferase, and this test is commonly called a liver enzyme test. In reality ALT is found in several organs and tissues to include: liver, skeletal muscles, heart muscle, and kidney . . . but this enzyme is found in the greatest quantity within the liver. ALT is an enzyme that will show up in the blood when there is damage or destruction of cells in these tissues. You may know of someone who needed to periodically get their “liver checked” while being on a medication - such as a cholesterol medication. They were most likely getting these two main liver enzymes tested (AST and ALT) as a common screening test for liver function in blood testing. Your liver has many important functions in the body including: removing chemicals and toxins from the body, it’s involved in blood sugar control, it activates the majority of thyroid hormone into its more bioactive form (T3) to improve energy and metabolism, and much more. Your liver is a very resilient organ, as you can have as little as 20% of good liver function and still have these liver enzymes test in the normal range. This means that when the ALT begins to test outside the optimal range we want to take action more quickly to help improve function before any more damage happens to the liver or other affected tissues. When ALT is in the Clinical High range we first think of a problem affecting the liver. The stress on the liver could be due to some type of infection or inflammation, a medication or other chemical stress, alcohol intake, or other reasons. When these liver enzymes (AST, ALT and GGT) begin testing at or near 100 we begin to think about some type of Fatty Liver Disease. When these are testing at or over 200 we become more concerned about Hepatitis. Elevated levels of ALT may require additional testing or referral to a specialist to determine the origin of liver stress. Other reasons that may result in a high ALT include: 1) a gall bladder problem, or 2) a condition resulting in muscle tissue breakdown. Because ALT is more specific to the liver than AST . . . we will feel more confident that a problem exists within the liver when ALT is elevated.

Bilirubin

NEGATIVE Optimal

Your result for this lab test is in the OPTIMAL range.

Bilirubin in urine is a type of bile pigment found in the body. It is produced when red blood cells break down and is then processed and excreted in the bile and urine. Its purpose is to help the body get rid of waste and rid itself of toxins. Bilirubin is an important indicator of liver health and is typically present in the urine in small amounts.

Having optimal levels of Bilirubin in the urine is important for overall health. Optimal levels indicate that the liver is functioning properly, while higher levels may indicate liver damage or other health issues. High levels of Bilirubin can also indicate the presence of jaundice, which is a condition caused by an excess of Bilirubin in the body. Low levels of Bilirubin can be indicative of anemia, which is a deficiency in red blood cells. Keeping Bilirubin levels in check can help ensure that the liver is functioning optimally and that the body is healthy overall.

Bilirubin, Total

0.8 Optimal

Your result for this lab test is in the OPTIMAL range.

Bilirubin is a yellowish pigment that is produced as a byproduct of red blood cells breaking down. It is present in the blood and is a major component of bile, which helps the body digest fat. The liver is responsible for

removing bilirubin from the blood and excreting it via bile.

Having optimal Bilirubin levels in the blood is important for overall health and well-being. High levels of Bilirubin can indicate a number of issues such as liver damage, gallbladder problems, or anemia. On the other hand, when Bilirubin levels are too low, it can signal problems in the production of red blood cells or the breakdown of hemoglobin. Maintaining optimal levels of Bilirubin is important for keeping the body healthy and functioning properly.

eGFR

46 Clinical Low

eGFR Your result for this test is in the Clinical Low range. eGFR (estimated Glomerular Filtration Rate) is a measure of your kidney function, and the concern is when the GFR number drops too low. Within your kidneys are small clusters of blood vessels called Glomeruli which act like tiny filters in the kidneys that remove waste products out of your blood, while still keeping the good things we need to remain in your blood - like protein and red blood cells. The GFR refers to the amount of blood that is filtered by the Glomeruli per minute. As kidney function declines due to disease or damage, the rate at which your blood gets filtered by your kidneys also decreases and waste products begin to build-up in your blood. This lab test combines your level of Creatinine with a formula that factors in your age, sex and race to determine your eGFR (estimated Glomerular Filtration Rate). Low GFR along with a high BUN (Blood Urea Nitrogen) and high Creatinine will create the greatest concern for altered kidney function and may require further evaluation with a specialist to determine the cause of abnormal kidney function or confirm the presence of kidney disease.

Creatinine

1.7 Clinical High

Creatinine Your result for this lab test is in the CLINICAL HIGH range. Creatinine is found within muscle tissue and is released into the blood stream during muscle contraction or breakdown of muscle tissue. Since almost all Creatinine is removed by the kidneys . . . testing blood levels of Creatinine is a good measure of how well the kidneys are working. Creatinine is also relative to the amount of muscle on the body, so a person with higher muscle mass will have slightly higher Creatinine levels and a person with low muscle mass will have slightly lower levels. Creatinine is derived from Creatine which is used as a source of energy in muscle contraction and is produced mostly within in the liver. Remembering the difference between Creatinine and Creatine can be confusing because the words are so similar, so it helps to understand the sequence of events leading up to Creatinine getting released into the blood. First - Creatine is made in the liver and then transported to the muscle tissue to be used as an energy source for muscle contraction. Second - Creatinine then gets released into the blood due to muscle contraction or other conditions that result in muscle tissue breakdown. When Serum Creatinine is in the Clinical High range we must first consider if there is a problem with kidney function, and this should be correlated with other kidney function tests like BUN and GFR. High Creatinine combined with a high BUN (Blood Urea Nitrogen) and low GFR (Glomerular Filtration Rate) will create the greatest concern for altered kidney function and may require further evaluation with a specialist to determine the cause of abnormal kidney function or confirm the presence of kidney disease. High Creatinine can also be caused by other factors such as 1) dehydration, 2) extreme exercise (extreme muscle contraction) prior to getting your blood sample taken, 3) very high protein intake in diet, 4) high intake of a nutritional supplement called Creatine, 5) high Vitamin C intake, 6) any condition that results in faster breakdown or damage of muscle tissue, and 7) can be caused by some medications. It could also be

that the kidneys are working fine but the flow of urine from the kidneys to the bladder and out of the body is being slowed down or obstructed due to an enlarged uterus or enlarged prostate. This would result in a back-up of Creatinine in the kidneys and then higher levels found in the blood and may require additional testing or examination to confirm.

Urea Nitrogen (BUN)

14 Optimal

Your result for this lab test is in the OPTIMAL range. C-Reactive Protein is produced by the liver and it is released into the bloodstream with inflammation, infection and injury of tissues. It is most often used as a measure of inflammation within the body that tends to be more recent or more acute. The “Cardiac” portion of this lab test name refers the High Sensitivity version of this lab test. This means we are trying to detect smaller levels of this protein due to inflammation which has also been shown to be a risk factor for cardiovascular problems, and its ability to predict the risk of a future cardiovascular event such as heart attack and stroke. However, the inflammation may be located anywhere in the body and is not specific to only the cardiovascular system. Inflammation has the nickname of the “silent killer” because inflammation often precedes many of the chronic diseases that people suffer with when they get older. Identifying inflammation now and getting it under control could very well help to prevent a health problem later in life, or at the very least help to reduce the severity of a future health problem.

BUN/Creatinine Ratio

8 Functional Low

Your result for this lab test is in the FUNCTIONAL LOW range. The BUN/Creatinine Ratio is a measure of kidney function that compares the ratio between BUN and Creatinine. This lab test is primarily useful for those that have already been diagnosed with some type of chronic kidney dysfunction or disease. This lab test needs to be viewed in relation to other kidney function tests. Because many things can change the results for BUN and Creatinine as individual tests . . . a slightly altered BUN/Creatinine Ratio is of little concern when other kidney function tests are normal.

Color

YELLOW Optimal

Your result for this lab test is in the OPTIMAL range.

The color of urine can tell you a lot about the state of your health. Urine is typically a pale yellow color, but can range in hue from light yellow to dark amber. This is due to the presence of urobilin, a pigment produced by the breakdown of hemoglobin, in the urine. The color of urine is an indication of the amount of water and waste in the urine. When the amount of water is low, the urine will appear darker.

The most common color of urine is a pale yellow, which is typically indicative of a healthy individual. If the urine is clear, it may be a sign of over-hydration, as the body is eliminating more water than it needs. On the other hand, if the urine is a dark yellow or brown, it could be a sign of dehydration, or it may indicate an infection or medical condition. Having clear or yellow urine is generally indicative of good health.

Appearance

CLEAR Optimal

Your result for this lab test is in the OPTIMAL range.

Urine is a liquid by product of the body that is expelled from the body through the bladder and out of the body through the urethra. It serves as a way to dispose of waste and toxins from the body. The appearance of urine can tell a lot about an individual's health and well being. The color of urine can range from a pale yellow to a deep amber color and can be an indicator of certain conditions or issues that a person may be facing. When the color of urine is darker, it can be a sign of dehydration or a more serious medical condition such as a urinary tract infection or liver disease.

Having a yellow appearance in your urine can mean a variety of things. For example, it may mean that you are dehydrated and need to drink more water. It can also mean that you are eating a lot of yellow-colored foods such as carrots and squash, or that you are taking certain medications. In any case, it is important to speak with a doctor if the color of your urine is unusually yellow or if you are experiencing other symptoms such as fatigue and nausea. These could be signs of a more serious health condition.

Specific Gravity

1.021 Optimal

Your result for this lab test is in the OPTIMAL range.

Specific Gravity of urine is a measure of the ratio of the density of urine to the density of water. It is used to help diagnose and monitor various disorders related to the kidneys and urinary tract. It can also be used to determine the amount of solutes or other substances in the urine.

Having optimal Specific Gravity in the urine is important for health. It helps to ensure that the body is properly hydrated and that the levels of solutes in the urine are within a healthy range. It is also important for preventing the development of health conditions such as urinary tract infections, kidney stones, and bladder cancer. Keeping your specific gravity in the optimal range can help to keep your body functioning in a healthy way.

Ph

7 Optimal

Your result for this lab test is in the OPTIMAL range. A urine pH level test analyzes the acidity or alkalinity of a urine sample. Keeping a pH balance in your body is crucial to your overall health. Excess acidity in the body can become a dangerous environment that weakens the body, creating the ideal conditions for disease. When excess acids need to be neutralized, we use the body's alkaline reserves, leaving us in a weakened state. Some foods, and medicines can affect urine pH. Some factors that can cause a high (alkaline) pH are 1). severe vomiting, 2.) a kidney disease, 3.) some urinary tract infections, 4). and asthma.

Reducing Substances

Occult Blood

NEGATIVE Optimal

Your result for this lab test is in the OPTIMAL range.

The Occult Blood of urine, or a urine test for occult blood, is a test used to detect the presence of hidden (occult) blood in the urine. This test can be used to detect a variety of medical issues, including kidney disease, bladder cancer, and urinary tract infections. Urine tests for occult blood can also be used to diagnose certain types of anemia, such as hemolytic anemia.

Having optimal occult blood in the urine is highly important for overall health. It indicates that there are no underlying medical conditions causing hematuria and that the kidneys and urinary tract are functioning properly. Normal levels of occult blood in the urine can help reduce the risk of future health complications and provide peace of mind that the body is functioning as it should.

Protein

NEGATIVE Optimal

Your result for this lab test is in the OPTIMAL range.

The Protein of urine is a measure of the amount of protein present in a urine sample. It is typically used to help diagnose and monitor kidney diseases and other conditions that may cause changes in the amount of protein in urine. Protein in urine can be a sign of a kidney disorder such as glomerulonephritis, pyelonephritis, or lupus nephritis. It can also be an indicator of a urinary tract infection or a systemic disorder, such as diabetes or high blood pressure.

Having optimal protein in the urine is important for overall health. It can indicate whether or not the kidneys are filtering properly, and can help determine if there is an underlying health issue. Protein levels in the urine can also be used to monitor the progression of kidney disease. If the protein level is too high, it can indicate that the kidneys are not functioning properly and may need to be addressed. Having optimal protein in the urine can help ensure that your body is functioning at its best.

Nitrite

NEGATIVE Optimal

Your result for this lab test is in the OPTIMAL range.

The Nitrite of urine is a test used to detect a bacteria known as Escherichia coli, more commonly known as E. coli. This bacteria can cause urinary tract infections (UTIs). The test works by looking for the presence of nitrite in the urine. If nitrite is present, it indicates that the bacteria is present and the patient likely has a UTI. The test is often done in conjunction with a urine culture to confirm the presence of E. coli.

Having optimal Nitrite in the urine is important for overall health. If the Nitrite of urine is too high, it can indicate the presence of an infection. This can lead to serious health complications if not properly treated. On

the other hand, if the Nitrite of urine is too low, it can indicate a lack of sufficient bacteria in the urinary system, which can lead to a weakened immune system and other health issues. Having the right balance of Nitrite in the urine is important for maintaining optimal health.

Leukocyte Esterase

NEGATIVE Optimal

Your result for this lab test is in the OPTIMAL range.

Leukocyte Esterase is an enzyme present in the urine that is used to detect the presence of white blood cells. It is a sign that the body is fighting an infection. The purpose of Leukocyte Esterase is to identify the presence of infection in the urinary tract. It may also indicate a urinary tract infection, kidney infection, or bladder infection.

Having optimal Leukocyte Esterase in the urine is important for maintaining good health. It indicates that the body is not fighting off an infection and that the urinary tract is functioning properly. Optimal levels of Leukocyte Esterase can help to prevent urinary tract infections and other health problems associated with an infection in the urinary tract. Regular testing of the urine can help to monitor the levels of Leukocyte Esterase and ensure that the body is functioning properly.

WBC - Urinalysis

NONE SEEN Optimal

Your result for this lab test is in the OPTIMAL range.

White Blood Cells (WBCs) are a type of immune cell that helps the body fight off infections. They are found in the urine when the body is fighting off an infection and is trying to clear the infection from the urinary tract. WBCs are usually present in small numbers in the urine, but when they are present in larger numbers, it can indicate an infection. The presence of WBCs in the urine can indicate an infection such as a urinary tract infection or a sexually transmitted infection.

Having optimal WBCs in the urine is important for good health. Optimal levels of WBCs can help to ensure that the body is able to fight off any infection quickly and effectively. It is important to see a doctor if you have elevated levels of WBCs in your urine, as this could indicate an infection or other medical condition. Proper diagnosis and treatment can help to ensure that any infection is treated quickly and effectively.

RBC - Urinalysis

None seen Optimal

Your result for this lab test is in the OPTIMAL range.

Red Blood Cells (RBCs) are cells that are found in the urine, and they are an important indicator of health. RBCs are normally found in the bloodstream, but they can also be found in the urine when small amounts of blood leak into the urinary tract. RBCs in the urine can be a sign of a variety of medical conditions, such as urinary tract infections, kidney diseases, and prostate problems. Therefore, it is important to have optimal

RBCs in one's urine in order to maintain good health.

Having optimal Red Blood Cells (RBCs) in the urine is important for overall health and wellbeing. It is normal for RBCs to be present in small amounts in the urine, however, if the amount of RBCs increases to above the normal range, it could be a sign of an underlying medical condition. Therefore, it is important to maintain optimal RBCs in one's urine in order to prevent any potential health issues from developing. Optimal RBCs in the urine can be achieved by drinking plenty of water, eating a balanced diet, and exercising regularly. Additionally, regular check-ups with a doctor can help to identify any issues with RBCs in the urine.

Squamous Epithelial Cells	

Bacteria	**NONE SEEN** Optimal

Your result for this lab test is in the OPTIMAL range.

The Bacteria of urine is an indicator of the health of the urinary tract. Urine that contains bacteria is often referred to as "dirty" urine. This can be a sign of an infection, such as a bladder infection, that needs to be treated. The presence of bacteria in the urine can also be caused by other factors, such as a reaction to medications or the presence of sexually transmitted infections.

Having optimal Bacteria in the urine is important for overall health. It helps to prevent infections and keeps the urinary tract healthy. It is also important to keep the urinary pH balance at an optimal level. A balance of healthy bacteria helps to maintain the body's natural defenses, which can help to reduce the risk of getting infections. It is important to maintain a healthy balance of bacteria in the urine, as it can help to keep your urinary tract healthy and prevent infections from developing.

Calcium Oxalate Crystals	

Crystals	

Hyaline Cast	

Casts	**NONE SEEN**

Amorphous Sediment	
Transitional Epithelial Cells	
Renal Epithelial Cells	
Triple Phosphate Crystals	
Granular Cast	
Yeast	
Uric Acid Crystals	

Deep Dives

Testosterone, Total, Ms	**870** Clinical High

Your result for this lab test is in the CLINICAL HIGH range. Testosterone is the main sex hormone in men, and it is responsible for male physical characteristics. Although it is considered to be a "male" sex hormone, it is present in the blood of both men and women. Testosterone is mainly produced by special endocrine tissue (the Leydig cells) in the male testicles. It is also produced by the adrenal glands in both men and women, and by the ovaries in small amounts in women.

Testosterone levels are diurnal, peaking in the early morning hours (about 4:00 to 8:00 am), with the lowest levels in the evening (about 4:00 to 8:00 pm). Levels also increase after exercise and also decrease with age. Testosterone exists in your body in an active form called the “Free” form, and in an inactive form where

Testosterone is not available for use by your body because it is bound to a protein. This lab test measures the total amount of Testosterone in your body in BOTH the active and inactive forms.

When Total Testosterone is in the Clinical High range we must first determine if this is due to an overexposure to the hormone from an external source, or from an overproduction of the hormone inside the body. Exposure to Testosterone from an external source could include: 1) someone who is on a Testosterone hormone therapy as prescribed by a medical provider; 2) being in close physical contact with someone who is using a Testosterone lotion, gel or cream as part of a prescribed hormone therapy resulting in the hormone being absorbed into the skin of a second individual unintentionally; 3) the intentional intake of Testosterone as a steroid hormone for muscle building, performance enhancement, or other reasons. An abnormal overproduction of Testosterone from within the body could include testicular tumors, adrenal tumors that are producing testosterone, or pituitary tumors that are causing an overproduction of Luteinizing Hormone (LH) which signal the testicles (in men) to produce Testosterone. A Clinical High level of Testosterone is abnormal and should be evaluated by a qualified healthcare provider to determine the origin of the problem if the cause is unknown to the patient.

Estrogens, Total

121 Optimal

Your result for this lab test is in the OPTIMAL range. Estrogen is released by the gonads, adrenal glands, and placenta. The measurement of total estrogens provides a comprehensive evaluation of estrogen levels in both men and women.

Levels fluctuate based on cycle.

	Male (pg/mL)	Female (pg/mL)	
Prepubertal	40	40	
Adult	56-213	1 to 10d	16-328
		11 to 20d	34-501
		21 to 30d	40-244
		Post-menopausal	40-244

Sex Hormone Binding Globulin

45.8 Functional Low

Your result for this lab test is in the FUNCTIONAL LOW range.

Sex Hormone Binding Globulin (SHBG) is a protein that is produced by the liver and is found in the blood. It binds to the hormones testosterone and estradiol, preventing them from being used by the body. This is

important for both males and females because it helps regulate the levels of these hormones in the bloodstream. By doing this, it helps to maintain the proper balance of hormones in the body, which is essential for good health.

Having low SHBG in the blood can have a significant impact on health for both males and females. In males, it can lead to increased acne, increased body hair, and a decrease in muscle mass. In females, it can lead to heavy menstrual bleeding, infertility, and an increased risk of developing breast cancer. Low SHBG levels can also be a sign of metabolic syndrome, thyroid disorders, and other endocrine disorders. Therefore, it is important to maintain healthy levels of SHBG in the body to ensure optimal health.

TSH

3.6 Functional High

Your result for this lab test is in the FUNCTIONAL HIGH range. TSH refers to Thyroid Stimulating Hormone and it is with this hormone that the brain (or more specifically a part of the brain called the pituitary) is able to control the thyroid gland and the production of thyroid hormone. Thyroid hormone plays a major role in controlling your metabolism and energy production. If the brain senses too little thyroid hormone in the body then TSH will increase to tell the thyroid to produce more hormone. If the brain senses there is too much thyroid hormone in the body then TSH will decrease as a way of telling the thyroid to produce less hormone. TSH is the most common lab test performed by doctors to measure thyroid function. However, too many health providers rely on this test as the only measure of thyroid function, and this can be very misleading. The TSH lab result can be in the labs normal range and a person can still have altered thyroid function as determined by other thyroid lab tests. This overreliance on TSH as a primary indicator of thyroid function has resulted in millions of people not getting properly diagnosed with a real thyroid problem. A more comprehensive testing of thyroid function should be performed to have greater confidence that the thyroid gland is truly working at an optimal level . . . especially when a person is struggling with several symptoms of poor thyroid function. The thyroid has the nickname of the “great mimicker” because poor thyroid function can cause many symptoms and mimic many other health conditions. Some people go from one doctor to another trying to find out what is causing their symptoms . . . only to find out that their poor thyroid function is playing a major role in their health problems. Symptoms of underactive or hypo-thyroid function can include: fatigue, weight gain, soreness in muscles and joints, headaches, depression, constipation, slow metabolism, hair falling out, dry skin, intolerance to cold, menstrual changes in women, and more. Symptoms of overactive or hyper-thyroid function can include: sudden weight loss, anxiety and nervousness, rapid heartbeat, hands and fingers trembling, increased sweating, enlarged thyroid gland / swelling of the neck, difficulty sleeping, and more. Because poor thyroid function can affect many metabolic functions within the body, and can alter many lab results (not just the ones testing thyroid directly) . . . improving thyroid function becomes a higher "priority" when it’s discovered that it’s not functioning at an optimal level. When the TSH is in the Functional High range this will indicate a pre-hypothyroid condition. Meaning that it does not meet the clinical definition of hypothyroidism, but a person may still be experiencing symptoms and the effects of lowered thyroid function. Instead of waiting for the problem to get worse . . . which could take many years and a slow decline of health over those years . . . It would be much more beneficial to take action now to bring thyroid function back to optimal. It will always help to compare this with other thyroid lab tests to confirm changes in thyroid function. Factors that can contribute to TSH in the Functional High range may include: 1) a liver problem as the liver is highly involved in converting thyroid hormone into its most biologically active form called T3, 2) a pituitary problem as the pituitary produces TSH to control the thyroid gland, 3) a hypothalamus problem as the hypothalamus controls the pituitary and this is really the beginning of the hormonal communication within the body, 4) other hormone imbalance such as excess estrogen (estrogen dominance) affecting thyroid function,

5) chemicals or toxic heavy metals in the body disrupting thyroid function, 6) nutrient deficiencies such as iodine and selenium that can affect thyroid function, and 7) the effect of some medications - including taking a taking a thyroid medication dose that is a little too low for your body if on thyroid medication.

T4, Free (Direct)

1.45 Optimal

Your result for this lab test is in the OPTIMAL range. Having optimal Free T4 (Direct) levels means your thyroid is producing a healthy amount of thyroxine (T4), which is critical for regulating your metabolism, energy, mood, body temperature, and more. Free T4 reflects the amount of unbound (active) thyroxine circulating in your blood, ready to be used by cells. Optimal levels suggest: Healthy Thyroid Gland Function: Your thyroid is producing the right amount of hormone. Proper Pituitary Regulation: Your brain (via TSH) is communicating well with your thyroid. Good Nutritional Status: Nutrients like iodine and selenium are likely sufficient to support hormone production and conversion. Low Inflammation and Stress: Chronic inflammation and high cortisol can suppress thyroid functionyour levels suggest these arent a major issue. Balanced Hormonal and Metabolic Systems: Your body likely has healthy feedback loops between the thyroid, pituitary, and hypothalamus. Your thyroid is functioning optimallygreat job! To keep it that way: nourish with selenium, iodine, and zinc; manage stress; avoid toxins; and keep your gut and adrenal systems healthy.

Thyroglobulin Antibody

2.1 Functional High

Your result for this lab test is in the FUNCTIONAL HIGH range. High levels of thyroglobulin antibodies (TgAb) typically mean your immune system is attacking your thyroid gland. This is a sign of an autoimmune thyroid disorder, most commonly: 1. Hashimoto's thyroiditis (most frequent cause) 2. Graves' disease (less common) 3. Less frequently: other autoimmune diseases or thyroid cancers (rare)
Thyroglobulin is a protein made by your thyroid that helps produce thyroid hormones (T3 and T4). In autoimmune conditions, your immune system misidentifies thyroglobulin as a threat and produces antibodies (TgAb) against it. This can gradually damage the thyroid and affect hormone production.
Important: High TgAb levels alone aren't a diagnosisthey need to be interpreted alongside TSH, Free T4, Free T3, and TPO antibodies.
High TgAb means your immune system is targeting your thyroid. The goal isn't just to lower the antibody numbers, but to reduce inflammation, protect thyroid tissue, and support immune balance through diet, lifestyle, and specific supplementation. Consider working with a functional or integrative practitioner who can tailor testing and treatment to your case.

Triiodothyronine (T3), Free

2.79 Functional Low

Your result for this lab test is in the FUNCTIONAL LOW range. Free T3 (Triiodothyronine) is the active thyroid hormone responsible for regulating metabolism, energy, temperature, and more. A low Free T3 result can indicate that your body isn't producing or converting enough active thyroid hormoneeven if other thyroid labs (like TSH or Free T4) are normal.
Common Causes of Low Free T3: Poor Conversion of T4 to T3: The thyroid mostly produces T4, which needs to be converted to T3 in the liver, gut, and other tissues. Inflammation, stress, and poor liver function can

impair this process.
Chronic Stress / High Cortisol:
Cortisol can inhibit the enzyme that converts T4 to T3, leading to low T3.
Low-Calorie or Low-Carb Diets:
These can slow thyroid function to conserve energy, decreasing T3 production.
Nutrient Deficiencies:
Selenium and zinc are crucial for T4-to-T3 conversion.
Iron is needed for proper thyroid hormone synthesis.
Vitamin D and B vitamins also support thyroid function.
Liver or Gut Issues:
These organs are essential for converting T4 to T3 and clearing out inactive hormone (reverse T3).
High Reverse T3:
Sometimes the body makes more reverse T3 (inactive) instead of active T3, often due to stress or inflammation.

Thyroid Peroxidase (TPO) Antibody

18.0 Functional High

Your result for this lab test is in the FUNCTIONAL HIGH range. High TPO antibodies mean your immune system is attacking your thyroid, a hallmark of autoimmune thyroid disease. The most common causes include:
1. Hashimoto's Thyroiditis: The most common cause of elevated TPO antibodies.
Your immune system targets the thyroid, gradually reducing its function (often leading to hypothyroidism).
2.Graves' Disease
Less commonly, TPO antibodies can also be elevated in hyperthyroid autoimmune conditions.
3. General Immune Dysregulation
Chronic stress, infections, toxins, poor gut health, or genetic predisposition can trigger the immune system to produce these antibodies.
High TPO antibodies don't always mean you'll develop symptoms immediately, but they are a red flag for potential or developing thyroid dysfunction.

Reverse T3, Serum

13.9 Functional Low

Your result for this lab test is in the FUNCTIONAL LOW range. Reverse T3 (rT3) is an inactive byproduct of T4 (thyroxine) metabolism. It's produced when T4 is converted by the body into rT3 instead of the active thyroid hormone T3 (triiodothyronine). Low rT3 levels usually indicate that your body is not diverting T4 into the inactive rT3 pathwaywhich can happen for a few main reasons:
Possible Causes of Low rT3:
Low T4 levels: If your free T4 is low, there's simply not enough substrate to produce rT3.
High T3 demand or conversion: Your body may be preferentially converting T4 into active T3 instead of rT3, especially during recovery from illness or if you're under-treated for hypothyroidism.
Low cortisol or adrenal dysfunction: The enzyme that converts T4 to rT3 is influenced by cortisol. If your cortisol is low (from adrenal fatigue or HPA axis dysfunction), rT3 production can drop.
Liver dysfunction: The liver plays a key role in T4-to-rT3 conversion. Liver issues or poor liver function can reduce rT3 levels.

Low calorie intake / malnutrition: While starvation usually raises rT3, prolonged undernutrition or protein deficiencies may paradoxically lower it due to impaired thyroid hormone production overall.
Low Reverse T3 may reflect low T4 availability, increased T3 conversion, low cortisol, or liver dysfunction. It's not usually harmful on its own, but may indicate a broader hormonal or metabolic issue. To improve balance: Eat adequate calories and protein, Support liver health, Manage stress and cortisol, Ensure micronutrient intake (selenium, zinc, iodine), Avoid overtraining or prolonged fasting

Dehydroepiandrosterone (DHEA)

158 Functional Low

Your result for this lab test is in the FUNCTIONAL LOW range. Low DHEA levels in lab work can be due to several physiological, lifestyle, or medical factors. DHEA (Dehydroepiandrosterone) is an adrenal hormone that serves as a precursor to sex hormones (estrogen and testosterone) and is vital for mood, energy, immune health, and aging.
Common Reasons for Low DHEA:
Aging DHEA levels naturally decline with age, starting in your late 20s or early 30s.
Adrenal Fatigue / Chronic Stress Ongoing stress overworks the adrenal glands, reducing their ability to produce DHEA.
HPA Axis Dysregulation Imbalance in the hypothalamus-pituitary-adrenal axis can suppress DHEA production.
Inflammation / Chronic Illness Autoimmune diseases, infections, and chronic inflammation can deplete adrenal reserves.
Poor Nutrition Deficiencies in healthy fats, protein, or key micronutrients (like zinc and vitamin C) impair hormone synthesis.
Medications Corticosteroids, insulin, opioids, and some antidepressants can lower DHEA levels.
Depression or Poor Sleep Sleep deprivation and mood disorders can suppress adrenal output.
Smoking or Excess Alcohol These can damage adrenal and hormonal health.
How to Improve DHEA Levels.
Nutrition: Healthy Fats Consume avocados, nuts, seeds, olive oil, and fatty fish to support hormone synthesis.
Adequate Protein Include lean proteins to maintain adrenal function.
Micronutrients: Vitamin C Found in citrus, bell peppers, and berries; supports adrenal health.
Magnesium Found in leafy greens, seeds, and whole grains; reduces stress response.
Zinc Found in shellfish, red meat, and pumpkin seeds; supports hormone production.
Omega-3s Anti-inflammatory and hormone supportive (fish oil, flaxseed, walnuts).
Lifestyle: Manage Stress Prioritize stress-reducing activities like meditation, deep breathing, yoga, or nature walks.
Quality Sleep Aim for 79 hours of restful sleep to allow adrenal recovery.
Exercise Smart Engage in regular moderate exercise; avoid overtraining which can further deplete DHEA.
Reduce Stimulants Limit caffeine and alcohol, which tax adrenal function.
Consider Adaptogens Herbs like ashwagandha, rhodiola, or holy basil may support adrenal balance (consult your healthcare provider first).

Free Androgen Index

65.9 Optimal

Your result for this lab test is in the OPTIMAL range. The Free Androgen Index (FAI) reflects the amount of free (active) testosterone available in your body. It is calculated as: FAI = (Total Testosterone / SHBG) 100
Your optimal FAI means that: Your testosterone production is healthy, and Your SHBG (Sex Hormone-Binding Globulin) is in a balanced range, allowing enough testosterone to remain free and biologically active. This suggests a strong hormonal balance.

Luteinizing Hormone (LH)

5.3 Optimal

Your result for this lab test is in the OPTIMAL range. Having optimal luteinizing hormone (LH) levels means your hypothalamic-pituitary-gonadal (HPG) axis is functioning properly. LH is a hormone produced by the anterior pituitary gland, and it's essential for regulating sex hormones and fertility: In women, LH supports ovulation and the production of progesterone by the corpus luteum. In men, LH stimulates Leydig cells in the testes to produce testosterone.
Optimal LH levels indicate that: Your pituitary gland is effectively signaling.
Your gonads (ovaries or testes) are responsive.
There is no hormonal suppression from chronic stress, illness, or exogenous hormones.
Optimal LH levels indicate a well-functioning hormonal system. To keep them optimal, maintain a balanced diet rich in essential nutrients, prioritize sleep and stress reduction, exercise moderately, and avoid environmental and hormonal disruptors.

Progesterone

.025 Clinical Low

Your result for this lab test is in the CLINICAL LOW range. Progesterone is a key hormone in the menstrual cycle, pregnancy, and general hormonal balance. Low levels can occur for a variety of reasons depending on your age, cycle phase, and overall health.
Progesterone is often thought of as a female hormone, but it's also important in males. In men, progesterone serves as a precursor hormone for testosterone and other steroid hormones and helps balance the effects of estrogen.
Hormonal imbalances: Low progesterone may reflect overall low steroid hormone production, including testosterone.
Adrenal insufficiency: Progesterone is made in small amounts by the adrenal glands. Stress or adrenal fatigue can reduce production.
Chronic stress: High stress elevates cortisol, which can disrupt the balance of progesterone and other hormones.
Nutritional deficiencies: Lack of key nutrients needed for hormone synthesis (like zinc, vitamin B6, magnesium) may lower progesterone.
Aging: Natural hormone production declines with age.
Certain medications or health conditions: Some drugs or illnesses can impair hormone production.
Manage stress with relaxation techniques (meditation, deep breathing, yoga).
Get regular, quality sleep (7 to 9 hours).
Exercise moderatelyboth resistance training and cardio support hormone balance.
Avoid excess alcohol and drug use.
Maintain a healthy weightobesity can disrupt hormone balance.
Eat nutrient-dense foods rich in:

Zinc: Found in oysters, beef, pumpkin seeds, nuts.
Magnesium: Leafy greens, nuts, seeds, whole grains.
Vitamin B6: Poultry, fish, bananas, potatoes.
Healthy fats: Avocados, olive oil, nuts, fatty fish (support steroid hormone production).
Include enough protein for hormone synthesis.
Avoid excessive sugar and processed foods, which can increase inflammation and hormone disruption.
Consider supporting adrenal health with adaptogenic herbs (like ashwagandha) after consulting a healthcare professional.
If you're concerned about your hormone levels, it's a good idea to discuss these lab results and symptoms with a healthcare provider who can offer personalized testing and treatment options.

FSH

5.6 Optimal

Your result for this lab test is in the OPTIMAL range. FSH (Follicle Stimulating Hormone) is produced by the pituitary gland and plays a vital role in reproductive health: In females, FSH stimulates the development of ovarian follicles and regulates the menstrual cycle. In males, FSH is essential for sperm production by acting on Sertoli cells in the testes.
If your FSH levels are in the optimal range, it typically means:
Your hypothalamic-pituitary-gonadal (HPG) axis is functioning well, sending the right hormonal signals.
You have a balanced level of sex hormones (estrogen in women, testosterone in men), which are crucial for proper FSH feedback regulation.
You're not experiencing major physiological stress, chronic illness, or endocrine disorders.
Lifestyle factors like nutrition, weight, sleep, and stress are in balance, supporting healthy hormone production.
How to Maintain Optimal FSH Levels
For Both Men and Women:
Eat a nutrient-dense diet with:
Lean proteins
Healthy fats (avocado, olive oil, fatty fish)
Whole grains and fiber
Plenty of fruits and vegetables (especially cruciferous veggies like broccoli, which help with hormone detoxification)
Key nutrients for FSH regulation:
Zinc (pumpkin seeds, seafood)
Vitamin D (sunlight, fatty fish, fortified foods)
B vitamins (whole grains, leafy greens, legumes)
Magnesium (nuts, seeds, dark chocolate)
Manage stress well: Chronic stress raises cortisol, which can suppress reproductive hormones.
Get quality sleep: Aim for 79 hours of consistent, restorative sleep.
Exercise regularly but not excessively: Moderate activity (like walking, strength training, or yoga) supports hormone balance. Overtraining can suppress FSH.
Maintain a healthy weight: Both underweight and obesity can disrupt hormone signaling.
Avoid endocrine disruptors:
Limit plastic use (especially for food storage).
Choose natural or low-toxicity personal care products.
Avoid smoking and limit alcohol: Both can negatively impact hormone health over time.

Female-Specific Tips
Avoid extreme diets or overexercise, especially if still menstruating.
Track your cycle to catch any early signs of hormonal imbalance.
Male-Specific Tips
Support testicular health with cool, non-restrictive clothing.
Include antioxidants (like vitamin C and E) to protect sperm production and FSH function.
Maintaining these habits supports not just FSH, but your overall hormonal and reproductive health.

Prolactin

21.4 Functional High

Your result for this lab test is in the FUNCTIONAL HIGH range. High prolactin levels can be caused by a wide range of physiological, pathological, and lifestyle-related factors. While mild elevations can be temporary or benign, significantly high prolactin levels may indicate an underlying issue requiring medical attention.
Common Causes of High Prolactin
1. Pituitary Tumor (Prolactinoma)
A prolactinoma is a benign tumor on the pituitary gland that secretes excess prolactin.
One of the most common causes of persistently high prolactin.
2. Medications
Some medications increase prolactin by reducing dopamine, which normally inhibits prolactin:
Antipsychotics (e.g., risperidone, haloperidol)
Antidepressants (especially SSRIs, tricyclics)
Anti-nausea drugs (metoclopramide, domperidone)
Opiates and estrogens
3. Hypothyroidism (Low Thyroid Hormone)
Low thyroid levels trigger TRH, which stimulates prolactin release.
4. Chronic Stress / Elevated Cortisol
Ongoing emotional, mental, or physical stress can disrupt the HPA axis and raise prolactin levels.
5. Sleep Disturbance
Prolactin is secreted in pulses during REM sleep; sleep deprivation or poor quality sleep can dysregulate it.
6. Other Causes
PCOS (in females), liver or kidney disease, intense exercise, or nipple/chest stimulation can all elevate prolactin.
How to Lower Prolactin Levels to Optimal with Lifestyle & Nutrition
Reduce Stress: Chronic stress increases cortisol and prolactin. Use mindfulness, journaling, and daily relaxation techniques.
Improve Sleep Quality: Get 79 hours of uninterrupted, quality sleep. Avoid screens 12 hours before bed.
Avoid Overtraining: Excessive endurance or HIIT without rest may raise stress hormones and prolactin. Stick to balanced workouts.
Eat a Balanced Diet: Ensure adequate nutrition; avoid fasting or extreme dieting, which can elevate stress hormones.
Limit Stimulants & Alcohol: Excess caffeine, nicotine, and alcohol can affect dopamine and hormone regulation.
Avoid Breast/Nipple Stimulation: Especially in females or postpartum, this can stimulate prolactin secretion.
Vitamin B6: Reduces prolactin by supporting dopamine (bananas, potatoes)
Zinc: Supports hormone balance and pituitary health (Pumpkin seeds, cashews)
Vitamin E: Antioxidant; supports pituitary function (Sunflower seeds, almonds, spinach)
Choline: Supports brain and hormone signaling (soy products, cruciferous vegetables (broccoli, cauliflower,

Brussels sprouts), quinoa, nuts (almonds, peanuts), and legumes)
L-tyrosine: Dopamine precursor; may indirectly lower prolactin (soy products, sesame seeds, and pumpkin seeds)
Important: Always consult your provider before starting supplements if you have a diagnosed prolactinoma or take medications.
If your prolactin is consistently elevated or accompanied by symptoms consult your health professional
You may need:
MRI of the pituitary
Full hormone panel (thyroid, LH, FSH, testosterone/estrogen)
Medication review

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