

SELFHACKED

— LAB TEST REFERENCE GUIDE —

Test name	Test Measures	Units	Reference Ranges	Optimal Ranges
RBC (Red Blood Cell)	Total number of RBC in the blood	$\times 10^6 / \mu\text{L}$	Male: 4.1-5.6 Female: 3.8-5.1	Male: 4.2-4.9 Female: 3.9-4.5
Hemoglobin	The amount of hemoglobin in the blood	g/dl	Male: 13.5-17.5 Female: 12.0-15.5	Male: 14-15 Female: 13.5-14.5
Hematocrit	The proportion of red blood cells in the blood	%	Male: 38.8-50.0 Female: 34.9-44.5	Male: 40-48 Female: 37-44
MCV (Mean Corpuscular Volume)	The average size (volume) of RBC	fl	87 ± 7	82-89.9
MCH (Mean Corpuscular Hemoglobin)	The average amount of hemoglobin per RBC	pg	29 ± 2	28-31.9
MCHC (Mean Corpuscular Hemoglobin Concentration)	The amount of hemoglobin per unit volume of the red blood cell	g/dl	34 ± 2	32-35
RDW (Red Cell Distribution Width)	The variability of the RBC volume	%	13 ± 1.5	<13
ESR	Erythrocyte sedimentation rate	mm/hr	Male: 0-15 Female: 0-20	Male: <5 Female: <10
WBC	Total number of WBC in the blood	$\times 10^3 / \mu\text{L}$	3.5-10.5	5.0-7.5
Neutrophils	Total number of neutrophils in the blood	$\times 10^9 / \text{L}$ %	2.0-7.0 40-74	40-60
Lymphocyte	Total number of lymphocytes in the blood	$\times 10^9 / \text{L}$ %	1.0-3.0 14-46	24-44

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CD3+ T Lymphocyte	Total number of CD3+ subset of lymphocytes	cells/ μ L	690-2540	1410
CD4+ T Lymphocyte	Total number of helper T-cells	cells/ μ L	410-1590	880
CD8+ T Lymphocyte	Total number of suppressor T-cells	cells/ μ L	190-1140	490
CD19+ B Lymphocyte	Total number of B lymphocytes	cells/ μ L	208-590	
Monocytes	Total number of monocytes in the blood	$\times 10^3/\mu$ L %	0.2-0.8 2-8	0-7
BUN (Blood Urea Nitrogen)	The amount of urea nitrogen in the blood	mg/dL	5-20	10-16
Creatinine	The level of creatinine in the blood	mg/dL	0.76-1.27	0.8-1.1
Uric Acid	The amount of uric acid in the blood	mg/dL	Male: 3.5-7 Female: 2.6-5.7	Male: 3.5-5.9 Female: 3.0-5.5
Serum Ferritin	The amount of iron stored in the body	ng/mL	Male: 33-236 Female: 10-122	Male: 33-236 Female: 10-122
Serum Iron	The amount of iron in serum	μ g/dL	Male: 65–175 Female: 50–170	50-100
TIBC (Total iron-binding capacity)	Total amount of iron carried in the blood	μ g/dL μ mol/L	250–450 44.8–76.1	250-450 44.8-76.1
UIBC (Unsaturated iron-binding capacity)	Levels of transferrin that has not bound iron	μ g/dL μ mol/L	120-470 21-84	150-37 26.85-67.125

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Transferrin (iron) saturation	The percentage of transferrin that is bound to iron	%	Male: 10–50 Female: 15–50	25-35
sTfR	The amount of soluble transferrin receptors in serum	mg/L	Male: 2.2-4.5 Female: 1.8-4.6	
Glucose	Fasting glucose level in the blood	mmol/L mg/dL	3.6-6.38 65-100	4.44-5.55 70-85
Glucose, urine	The amount of glucose in the urine	mmol/l mg/dL	0 - 0.8 0 - 15	
HbA1c	Hemoglobin bound to glucose	%	4.2-5.9	<4.5
Insulin	Insulin level in the blood	IU/mL	2 Hours Post Meal (Sustacal): 7.6 – 26 2 Hours Post Glucose (75 gm): 15 – 53	2.0-10.0
Insulin Antibodies	Level of antibodies against insulin in the blood	IU/mL	Adults: < 5.0 Type I Diabetes: 5 – 420	
Potassium	The amount of potassium in serum	mmol/L	3.5-5.5	4.0-4.5
Total Blood Copper	The total amount of copper in the blood	μmol/L μg/dL	10-22 65-155	Male: <5 Female: <10
Free Blood Copper	The amount of copper unbound by ceruloplasmin	μmol/L	1.6-2.4	
Copper, RBC	The amount of copper in red blood cells	μg/dL	46-79	46-79

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IGF-1	The amount of insulin-like growth factor 1 in the blood	ng/mL	Age: Female: Male: 1-2 yrs 56-144 30-122 3 yrs 26-162 20-141 4 yrs 32-179 25-157 5 yrs 39-18 30-174 6 yrs 55-238 37-192 7 yrs 55-268 55-268 Age 8-18 Refer to Tanner Stages 19-20 217-475 281-510 21-30 87-368 155-432 31-40 106-368 132-333 41-50 118-298 121-237 51-60 53-287 68-245 61-70 75-263 60-220 71-80 54-205 36-215 Female Tanner Stages: I (8-12yrs) 64-358 II (8-14yrs) 89-566 III (9-15yrs) 192-568 IV&V (11-18yrs) 147-646 Male Tanner Stages: I (8-15yrs) 52-391 II&III (8-16yrs) 39-648 IV&V (11-18 yrs) 144-673	250-350
Blood Ceruloplasmin	The amount of ceruloplasmin in the blood	µmol/L mg/dL	2.83-5.50 20-40	
Copper urine	Copper levels in the urine	µg/24 h	20–50	
Total Calcium	The total amount of calcium in the blood	mg/dL mmol/L	8.6-10.3 2.13 to 2.55	8.6-10.3
Ionized Calcium	The amount of free calcium in the blood	mg/dL mmol/L	4.6-5.3 1.1-1.35	

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Magnesium	The total amount of magnesium in the blood	mg/dL	1.8-2.6	>2.0
		mmol/L	0.74-1.07	>0.82
Zinc	The amount of zinc in serum	µmol/L	10.7-23.0	16-18
Zinc urine	The amount of zinc in the urine	mg/24 h	0.3-0.6	
FT3 (free T3)	The amount of free triiodothyronine in the blood	pg/mL	2.5-4.3	3.0-4.5
FT4 (free T4)	The amount of free thyroxine in the blood	ng/dL	0.9-1.7	1.0-1.5
rT3	The amount to reverse T3, inactive form of T3, in the blood	pg/mL	90-350	92-241
Total T3	The amount of total (free and bound to TBG) triiodothyronine in the blood	ng/dL	75-200	100-280
Total T4	The amount of total (free and bound to TBG) thyroxine in the blood	µg/dL	6-12	5.4-11.5
TBG	The amount of thyroxine binding globulin in the blood	µg/dL	13.0-39.0	18-27
TGAbs	The amount of antibodies that bind thyroglobulin in the blood	IU/mL	<4	0-0.9
TPOAb	The amount of antibodies that bind thyroid peroxidase in the blood	IU/mL	<35	<15
TRH	The amount of thyrotropin releasing hormone in the blood	IU/mL	5-25	

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TSH	The amount of thyroid stimulating hormone in the blood	IU/mL	0.27-4.2	1.4-2.0
T3 uptake	The unbound TBG in the blood	%	Male: 25-35 Female: 25-35 Pregnancy: 15-25	Male: 32-38 Female: 28-35
FTI (T7)	Free thyroxine index	mg/dL	4.6-10.9	1.2-4.9
ALP	The amount of alkaline phosphatase enzyme in the blood	U/L	20-140	70-100
TBIL	The amount of total, direct and indirect, bilirubin	mg/dL	0.2-1.2	0.2-1.2
DBIL	The amount of direct or unconjugated bilirubin	mg/dL	0.1-0.4	0.1-0.4
IBIL	The amount of indirect or conjugated bilirubin	mg/dL	0.1-1.0	0.1-1.0
Urobilinogen	The amount of urobilinogen in the urine	mg/24 hrs Ehrlich units /2hr	0.05-2.5 0.3-1.0	
Urobilinogen, feces	The amount of urobilinogen in feces	mg/24 hrs	Male: 57-200 Female: 8-150	
Triglycerides	The total amount of fatty substance triglyceride (fasting) in serum	mg/dL mmol/L	<250 <2.83	<100 1.1
CRP	The level of C-reactive protein in the blood	mg/L	0.0-10.0	<0.8
hs-CRP	The level of high sensitivity C-reactive protein	mg/L	0.0-3.0	<0.5

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GHRH	The amount of growth hormone-releasing hormone in the blood	pg/mL	Children: 6.8-19.0 Adults: ≤ 49	
GH	The amount of growth hormone in the blood	ng/mL	0-6	2-6
GH, urine	The amount of growth hormone in the urine	ng/g creatinine	0.2-13	
GHBP	The amount of growth hormone binding protein	pmol/L	686 – 2019	
GHAb	The amount of growth hormone antibodies		Negative	
GnRH	The amount of gonadotropin-releasing hormone in the blood	pg/mL	Male: 4.0-8.0 Females: 2.0-10.0	
hCG	The amount of human chorionic gonadotropin	mIU/mL	Male: <5 Female: Non-pregnant: <5 Postmenopausal: <10 Pregnant: < 1 wk 5-50 1-2 wk 50-500 2-3 wk 100-5000 3-4 wk 500-10000 4-5 wk 1000-50000 5-6 wk 10000-100000 6-8 wk 15000-20000 8-12 wk 10000-10000	
LH	The amount of luteinizing hormone in the blood	mIU/mL	Male: 1.5 – 9.0 Female: Follicular: 2.0–9.0 Mid-cycle: 18.0–49.0 Luteal: 2.0–11.0 Postmenopausal: 20.0–70.0	Within range

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Test name	Test Measures	Units	Reference Ranges	Optimal Ranges
FSH	The amount of follicle stimulating hormone in the blood	mIU/mL	Male: 2.0-9.2 Female: Follicular & Luteal: 1.8-11.2 Mid-cycle: 6-35 Postmenopausal: 30-120	Male: Within range Female: Women <50: within range Women >50: 25-100
Calcium	The total amount of calcium in serum	mg/dL	8.6-10.0	9.2-10.0
Calcium, ionized	The amount of free calcium in serum	mg/dL	4.64-5.28	
Calcium, urine	The amount of calcium in the urine	mg/24 h	100-300	
Dopamine	Dopamine level in the blood	pg/mL pmol/L	<30 <163	
Dopamine, urine	Dopamine level in the urine	µg/day	0-3 yrs: Not Established 4-6 yrs: 95-221 7-12 yrs: 76-371 13-17 yrs: 137-393 18-69 yrs: 77-324 >70 yrs: 56-272	
Norepinephrine (Noradrenaline)	Norepinephrine level in the blood	pg/mL pmol/L pg/mL pmol/L	Lying down: 70-750 381-4,083 Standing up: 200-1,700 1,088-9,256	
Serotonin	Serotonin level in the blood	ng/mL	101-283	

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Test name	Test Measures	Units	Reference Ranges	Optimal Ranges
DHEA-S, saliva	The amount of dehydroepiandrosterone sulfate in saliva	ng/mL	2.5-25 (age dependant)	Under 30: 6.4-18.6 31-45: 3.9-11.4 46-60: 2.7-8 61-75: 2-6
Estradiol (E2)	The amount of 17 beta-estradiol in the blood	pg/mL	Male: 10-50 Female: varies with menstrual cycle Follicular phase: 10-180 Mid-cycle peak: 100-350 Luteal phase: 40-200 Postmenopausal: <10	15-25 Day 3: <80 Day 14: 150-350
Estradiol, urine	The amount of estradiol in the urine	µg/24 hours	Male: 0-6 Female: Follicular phase: 0-3 Ovulatory peak: 4-14 Luteal phase: 4-10 Postmenopausal: 0-4	
Progesterone	The amount of progesterone in the blood	ng/mL	Male: 0.12-0.3 Female: Menstrual cycle Follicular phase: 0.02-0.9 Luteal phase 2-30 ng/mL Postmenopausal: <1	Male: <0.15 Women <50: within range Women over 50: 1.5-4.5
Progesterone, urine	The amount of progesterone in the urine	µg/24 hours	Male: up to 0.5 Female: up to 2.8	

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Total Testosterone	Total, free and bound to sex hormone-binding globulin, amount of testosterone in the blood	ng/dL	Male: 350-1100 Female: Premenopausal: 10-70 Postmenopausal: 7-40	>600 40-70 61-75: 2-6
Free Testosterone	The amount of free testosterone in the blood	pg/mL	Male: 6.6-26.5 Female: 0-2.2	Male: 15-26.5 Female: 1.4-2.2
		%	Male: 1.5-3.2 Female: 0.8-1.4	
Testosterone, bioavailable	The amount of testosterone not bound to proteins, and can be used by the body	ng/dL	Male: 20-39 yrs: 128-430 40-49 yrs: 95-350 50-69 yrs: 95-285 70-79 yrs: 60-240 Female: 1.1-14.3	
Prolactin	The amount of prolactin in the blood	µg/L	Children: 3.2-20 Male: 3-15 Female: Nonpregnant: 4-23 Pregnant: 34-386	Male: <10 Female: 2.1-5
CRH	The amount of corticotropin releasing hormone in the blood	pg/ml	Male: ≤34 Female: Non-pregnant: ≤34 Pregnant: 1st trimester ≤40 2nd trimester ≤153 3rd trimester ≤847	
ACTH	The amount of adrenocorticotrophic hormone in the blood	pg/ml	6-48	10-40

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Test name	Test Measures	Units	Reference Ranges	Optimal Ranges
Cortisol	The amount of cortisol in serum	µg/dL	8:00 a.m.: 8.0-19 4:00 p.m.: 4.0-11	8:00 a.m.: 10-15 4:00 p.m.: 6.0-10
Cortisol, saliva	The amount of cortisol in saliva	µg/dL	8:00 a.m.: 0.025-0.600 Noon: <0.010-0.330 4:00 p.m.: 0.010-0.200 Midnight <0.010-0.090	Same
Cortisol, urine	The amount of free cortisol in the urine	µg/ 24h	Children: 3-9 Male: 11-84 Female: 10-34 Pregnancy: 16-60	Same
Aldosterone	The amount of aldosterone in the blood	ng/dL	Supine: 3-16 Standing: 7-30	14-16
Aldosterone, urine	The amount of aldosterone in the urine	µg/24 h	3-19	
IPTH	The level of intact parathyroid hormone in the blood	pg/mL	10 – 65	
GLP-1	The amount of glucagon-like peptide 1 in the blood in the fasting state	pmol/l	5-10	
Leptin	The amount of leptin in the blood	ng/mL	Adults (BMI 18-25) Male: 1.2-9.5 Female: 4.1-25.0	3.7-7.4

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Oxytocin	The amount of cortisol in serum	ng/L	Adult: 1.25-5	
		pmol/L	1-4	
		ng/L	Women, ovulatory surge 5-10	
		pmol/	4-8	
Oxytocin urine	The level of oxytocin in the urine	pmol/24hr	250-700	
C4a	The amount of complement component C4a in serum	ng/mL	<2830	<2830
MMP-9	The amount of matrix metalloproteinase 9 in the blood	ng/mL	0-983	<330
VIP	The amount of vasoactive intestinal polypeptide in plasma	pg/ml	<75	23 - 63
MSH	The amount of melanocyte stimulating hormone	pg/ml	Alpha: Up to 5.0 Beta: Up to 150 Gamma: Up to 150	13 - 15
TGF-beta 1	The amount of transforming growth factor beta 1 in the blood	pg/ml	<2380	
VEGF	The amount of vascular endothelial growth factor in the blood	pg/mL	31-86	31-86

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Melatonin	The amount of melatonin in serum	pg/mL	Daytime: 2.0-80 Night time: 18.5-180	
ADH (Vasopressin)	The amount of vasopressin in the blood	pg/mL	0.7-3.8	<2
EPO	The amount of erythropoietin in serum	mIU/mL	2.6-18.5	
Vitamin A	The amount of vitamin A in serum	µg/dL µmol/LL	30-80 1.05-2.8	74-107
Vitamin B1 (Thiamine)	The amount of vitamin B1 in the blood	nmol/L	70-180	
Vitamin B2 (Riboflavin)	The amount of vitamin B2 in the blood	nmol/L	6.2-39.0	
Vitamin B3 (Niacin)	The amount of vitamin B3 in the blood	µg/mL	0.50-8.45	
Vitamin B5 (Pantothenic Acid)	The amount of vitamin B5 in the blood	µg/L	37-147	
Vitamin B6	The amount of vitamin B6 in the blood	ng/mL nmol/L	5-24 30-144	
Vitamin B7 (Biotin)	The amount of vitamin B7 in the blood	pg/mL	30-144	
Vitamin B9 (Folate)	The amount of folic acid in serum	ng/mL	Adults: 2-20 Children: 5-21	≥13
Vitamin B9, red blood cell	The amount of folic acid in red blood cells	ng/mL	200-600	

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Vitamin B12	The amount of vitamin B12 in serum	pg/mL	110-800	600-1000
		pmol/L	81-590	442.8-738
Vitamin C	The amount of vitamin C in serum	mg/dL	0.2-2.0	1.7-2.4
		μmol/L	11-114	85-170
Vitamin D, 1, 25-Dihydroxy	The amount of calcitriol in serum	pg/mL	Children: 15-90 Adults: 21-65	30-60
Vitamin D, 24-Hydroxy	The amount of calcidiol in serum	ng/mL	Children and adults: 20-100	75-100
Vitamin K	The amount of vitamin K in serum	pg/mL	80-1160	
Histamine	The amount of histamine in the blood	ng/mL	<1	<1
Homocysteine	The amount of total homocysteine in the blood	μmol/L	≤13	< 7.2
Homocysteine, urine	The amount of homocysteine in the urine	μmol/g creatinine	0-9	
Urea breath test	The amount of carbon dioxide in exhaled breath to diagnose H. pylori		Negative	
Serology test for H. pylori	The amount of H. pylori antibodies in the blood		H. pylori Ab (IgG) Negative H. pylori Ab (IgA) Negative	
Stool, fecal antigen test	The amount of foreign proteins (antigens) associated with H. pylori infection in the stool		Negative	