Optimale Werte für Hormone, Mineralstoffe, Vitamine und Risiko-Indikatoren

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Optimale Werte für Labortests
Empfohlene optimale Werte für eine durchschnittlich große Person

Für große, schwere und athletische Personen gelten ca. 10 – 25% höhere Blut-Werte für die anabolen Hormone: IGF-1, DHEAS, Testosteron, Dihydrotestosteron sowie ggfalls. Progesteron und Estradiol.

Für kleinere und leichtere Personen gilt das Gegenteil.

Diese Aussage gilt auch für die 24 Stunden Sammelurin Untersuchungen, bei denen die Hormonwerte mit der Kreatininausscheidung korreliert werden sollte – ausgenommen Patienten mit eingeschränkter Nierenfunktion.

Plasma	Suggested optimal value*	Suggested pathological value	References *(young adults ≤ 30 years)*	Possible deficiency if pathological value	Possible cause or consequence if pathological value
Nutritional					
Ferritine	120-150	<70 or > 300	23-233 ng/ml (M) 12-263 ng/ml (W) * (value of W >40 yrs	Microcytic anemia, slow T_4 to T_3conversion	
Vitamine B 12	550	< 350	200-835 pg/ml 140-616 pmol/l	Myelinisation defects, Macro-cytic anemia	
Folic acid erythrocytic	300	<200	90-400 ng/ml 0.2-0.9 µmol/l	Macrocytic anemia	
Vitamin C	1-2	< 0.5	0.2-2.0 mg/dl 11-113 µmol/l	scurvy	
Sodium	142	<138	136-145 mmol/l	Deficiency : 1°) aldosterone 2°) cortisol 3°) hemolysis	
Potassium	4.2	> 5	3.5-5.1 mmol/l		
		<3.5		↓ Fruit and vegetable intake	Excess: (1°) diuretics (2°) aldosterone
Magnesium erythrocytic	5	< 4.6	3.3-5.3 mEq/l 1.65-2.65 mmol/l		
Zinc	120	< 85	70-150 µg/dl		Infections, high conversion of testosterone to estradiol
Cupper	120	< 90	70-160 µg/dl		
Selenium	120 -140	< 90	70-150	Slow T_4 to T_3 conversion	
Vitamine E	12-20	< 12	5 – 20 mg/l 11.6-46.4 µmol/l	DHEA deficiency	
Vitamine A	950	< 600	300-1300 µg/l 0.7-2.80 µmol/l	Hypothyroidism	
Vitamine D 25-0H	35-40	< 25	6-60 ng/ml 89-149 nmol/l		Excess Parathyroid hormone
1, 25-OH	35	< 25	15-50 pg/ml		

Uric acid	4.5 (M) 4.0 (W)		3.4-7.0 mg/dl 202-416 µmol/l(M) 2.4-5.7 mg/dl (W) 143 – 339 µmol/l		
CRP		↑			atherosclerose
Hematocrite		>			High values → blood concentration, dehydration → levels to hormone bound to proteins may appear artificially high; high binding proteins may be caused by oral estrogen intake
Ureum (BUN)	25	> 35	15-45 mg/dl		
SHBG, transcortin, albumin, ...	Between reference values (& not border-line high)	↑↑ > upper reference			
Cholesterol	160-170	> 180	118-180 mg/dl (≤ 30 yrs)) < 220 mg/dl if no coronary pathology	Hypothyroidism; estrogen (W), testosterone (M), GH, DHEA deficiencies	Acceptable increase to 300 mg/dl in pregnancy
homocysteine	< 8	5.5 - 12	µmol/l	Folic acid deficiency, hypothyroidism	atherosclerosis
ENDOCRINE					
GH stimulated by GHRH, insulin, L-Dopa, clonidine, activity, ...	> 25	< 10	>10 ng/ml > 465 pmol/l	GH - IGF-1 deficiency	
Somatomedin C (IGF-1)	300-350 (M) 220-300 (W)	< 220 < 180	250- 450 ng/ml 230-410 ng/ml (21-30 yrs)		
IGF-BP-3	3,000	> 3,700			
TSH	1	> 2	0.2-4.0 µU/ml	hypothyrodism	
Free T_3	3	< 2.3	1.8-3.7 ng/l		
Free T_4	1.5	< 1.1	0.8-1.8 ng/dl		
ATG	0	> 50	0-50 U/ml	Hashimoto's thyroiditis	
ATPO (or AMI)	0	> 50	0-50 U/ml		
TSI (or TBII)	0	> 5	0-10 mU/ml		hyperthyroidism
Thyroglobulin	< 15 *	> 25	0-25 ng/ml		Goiter; * dessicated thyroid therapy→ ↑ thyroglobulin > 30
Calcitonin	8	< 4	0-15 pg/ml	osteoporosis	
Calcium	5	< 4.7 or >5.3	4.6-5.4 mg/dl 1.15-1.35 mmol/l		
Phosphorus	3.5-4.0	< 3	2.7-4.5 mg/dl 11.0-32.3 mmol/l		
Parathormone	25	< 15 or > 50	10-55 pg/ml	Hypo-parathyroidism	Hyper-parathyroidism
ACTH	40	< 20 or >80	20-110 pg/ml	Hypothalamic or pituitary hypocorticism	Cushing's disease

ACTH-test cortisol	> + 100 %	< + 75 %	200-500	Low adrenal reserve	-
Cortisol (total) (8h)	180	< 135	100-250 ng/ml 276-690 nmol/l		100-350 ng/ml in pregnancy
Transcortin (CBG)	25-30	> 40	20-50 mg/l		
Free cortisol (8h)	20	<14	10-30 ng/ml 27.6-82.8 nmol/l		
Cortisol (total) (16-20h)	70	< 50	30-100 ng/ml 83-276 nmol/l		30-200 ng/ml in pregnancy
Free cortisol - afternoon	13	< 6	2-20 ng/ml 5.5-82.8 nmol/l		
DHEA sulfate	400 (M) 250-300 (W)	< 250 < 200	200-610 µg/dl (M) 80-480 µg/dl (W)	DHEA deficiency	
Albumin	4.5	<3.5 or > 6	3.7-5.3 g/dl	DHEA deficiency, nephrotic syndrome	DHEA deficiency
Androstenedione	1.6	< 1.3	1-2 ng/ml (W)	DHEA &/or androstenedione deficiency	
Aldosterone (standing or after activity)	170	< 100	40-300 pg/ml 4.4-24.2 pmol/l	Hypo-aldosteronism	Hyper-aldosteronism secondary to hypocorticism or oral estrogen intake
Glucose	80-90	70 < or > 95	70-110 mg/dl 3.9-6.05 mmol/l	Hypocorticism	Diabetes
Insulin	5	< 4 or > 10	4-25 µU/ml	Diabetes type 1	Diabetes type 2
Hemoglobulin A1c	4.5	< 4 or >5.5	4-6 %	Diabetes	Diabetes
LH	4 (M) 4 (W)	2 < o > 8 > 15	2-12 mIU/ml (M) 0.5-20 mIU/ml (W)	Primary testosterone, DHT & progesterone deficiencies	24-105 at ovulation; Secondary testosterone, DHT & progesterone deficiencies; synthetic progestogen intake; testosterone overtreatment
FSH	3 (M) 5 (W)	> 7 (M) > 12 (W)	1-8 mIU/ml (M), 2-13 mIU/ml (W)	Estradiol & testosterone deficiencies	5-22 at ovulation
Prolactin	10	> 25	1-19ng/ml (M) 1-24 ng/ml (W)		Prolactinome; hyper-prolactinemia secondary to hypothyroidism or stress; may inhibit gonadal function & hormone secretions
Estradiol (W: 21st day of menstrual cycle)	20-25 (M) 150 (W)	< 35 < 110	10-35 (M) 100-210 pg/ml (W)	Estrogen deficiency	Hypo-progesteronism

Estrone (W: 21st day of cycle)	35 (M) 80	< 50	10-60 pg/ml (M) 40-200 pg/ml (W)		Oral estradiol intake
Progesterone (W: 21st day of cycle)	15	< 11	5-20 ng/ml (W)	Lack of ovulation; Progesterone deficiency; (hypothyroidsm, estrogen deficiency)	
SHBG	25-30 (M) 65 (W)	> 35 (M) <55 or >75(W)	20-55 pmol/l (M) 41-79 pmol/l (W)	Estrogen & thyroid deficiencies; androgen & GH excess	Oral estrogen intake , hyperthyroidism; androgen, GH & cortisol deficiencies
Testosterone	6500-7000 (M) 350 (W)	< 6000 (M) < 200 (W)	3000-10000 pg/ml 10.4-34.7 nmol/l W:150-400 (follicular phase), 200-600 (luteal)	Testosterone deficiency; synthetic progestogen intake;	Testosterone overtreatment
Free testosterone	280 8	< 200 (M) < 5 (W)	50-280 pg/ml 173-970 pmol/l 1.9-15 pg/ml (W) 6-52 pmol/l	Testosterone deficiency; oral estrogen intake (w/excess SHBG)	Testosterone overtreatment
Dihydrotestosterone	650-700 (M) 250 (W)	< 500 (M) < 150 (W)	300–1000 pg/ml (M) 150-350 pg/ml (W)	Testosterone deficiency; oral estrogen intake	Androgen male pattern baldness; transdermal testosterone treatment
Androstanediol glucuronide	15 - 17 (M) 3 (W)	< 13 (M)	3.4-22 ng/ml (M) 0.5-5.4 ng/ml (W)		
pregnenolone	150	< 100	20 -220 pg/ml	Total adrenal cortex deficiency	I