

Physiological passport of the body

Report creation date 17.03.2019

Patient

Nickname	Age (years)	Sex	Body mass (kg)	Height (cm)
Virtual Athlete A	39	male	80	180

Physiological avatar

Name	Measurement time	Time of creation
Avatar by observations of 09.12.2018	09.12.2018 00:00	23.02.2019 19:25

1. Main physiological parameters¹

Name	Value	Normal value	Deviation (%)	Unit
Total blood volume (TVB)	5333	5400	-1	ml
Hemoglobin concentration in the blood	155	155	0	g / l
Left ventricular inotropic status	0,63	0,55	14	
Right ventricular inotropic status	0,52	0,55	-5	

2. Resting state

2.1. Central hemodynamics

Name	Value	Unit
Heart rate	67	beats/min
Systemic systolic arteial pressure	118	mm Hg
Systemic diastolic arteial pressure	70	mm Hg
Average systemic arterial pressure	96	mm Hg
Average systemic venous pressure	9,0	mm Hg
Heart output	5,634	l/min
Cardiac index	2,86	l/min·m ²
Stroke index	0,043	l/m ²

¹Reduced TBV compared to the norm by more than 5% (hypovolemia) is a sign of dehydration or blood loss. Excess TBV relative norms by more than 5% (hypervolemia) is a sign of fluid retention in the body.

Inotropic state is a characteristic of its contractility. A decrease in the inotropic state of the ventricle relative to the normal value is a sign of a decrease in its pumping function. Normally, the inotropic states of the left and right ventricles are approximately equal. Asymmetry of values indicates pumping dysfunction of one of the ventricles.

2.2. Parameters of the vascular bed¹

Name	Value	Unit
Average general systemic peripheric resistance	1410	din•s/cm ⁵
Pliability systemic vascular	1,74	ml/mm Hg
Average general pulmonary peripheric resistance	251	din•s/cm ⁵
Pliability of pulmonary vascular	4,03	ml/mm Hg
The ratio of pulmonary TPR to systemic TPR	0,18	

¹Total peripheral resistance (TPR) of vessels - resistance of blood vessels to blood flow, resulting from blood viscosity, friction against the walls of blood vessels and vortex movements. Basically, the TPR is determined by the degree of narrowing of resistive vessels, which include arterioles and venules located in the pre- and postcapillary regions of the vascular bed. Normally, a system TPR should be between 1200 and 2500 din • s / cm⁵, and the ratio of pulmonary TPR to systemic TPR should be between 0.15 and 0.4.

By compliance of the vascular system is meant the value of C - the coefficient of elasticity of blood vessels $C = dV / dP$, ml / mm Hg, which is a characteristic of vascular tone.

2.3. Metabolism²

Name	Value	Unit
Oxygen consumption	2,21	ml / min per 1 kg of body weight
Saturation of arterial blood	100	%
Average saturation of venous blood	72	%
Calorimetric power of the body	113	W
Respiratory control ratio	0,86	
Lactate concentration in the blood	0,98	mmol/l
Basic metabolism	29,27	kcal/d/kg
Basic carbohydrate metabolism	19,26	kcal/d/kg
Basic non-carbohydrate metabolism	10,01	kcal/d/kg
Anaerobic basic metabolism	5,83	kcal/d/kg
Aerobic basic metabolism	23,44	kcal/d/kg

²The most important of the group of metabolic parameters is the respiratory factor (RF). RF is the ratio of carbon dioxide emitted to oxygen absorbed. RF is a complex indicator, depending on a variety of physiological factors. Normally, in the state of muscular rest, this indicator is 0.85 ± 0.1 .

Basal metabolism (BM) - the minimum amount of energy needed to ensure normal functioning in conditions of relative physical and mental rest. The normal BM value depends on age, gender and can be determined using well-known formulas or tables.

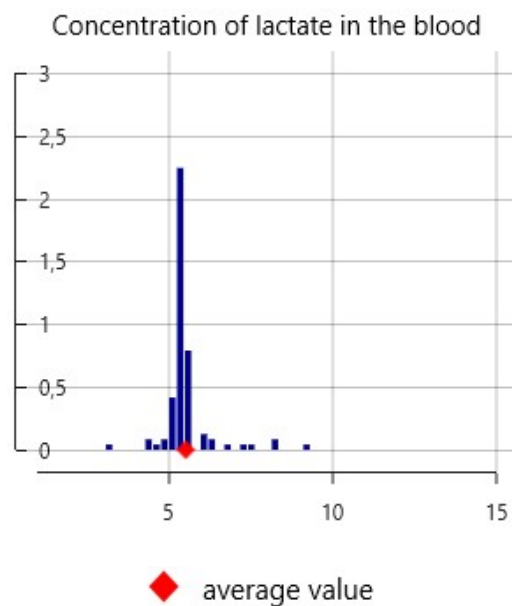
The oxygen consumption calculated per 1 kg of body weight at rest is normally 3.3–4 ml / min / kg. Deviations from the norm can be a sign of metabolic disorders.

3. State of physical activity

3.1. Anaerobic threshold¹

Name	Value	Standard deviation	Unit
Concentration of lactate in the blood	5,53	±0,72	mmol/l
Heart rate	155	±6	beats/min
Power	691	±35	W
Oxygen consumption	23,51	±1,24	ml/min/kg

¹The data on the parameters of the anaerobic threshold are probabilistic estimates of the average obtained during the operation of the statistical identification algorithm. Parameters of the anaerobic threshold point are the most important characteristics of physical endurance.



A histogram of the statistical evaluation of the blood lactate concentration parameter at the anaerobic threshold point. As an estimate of the value of the parameter, the average calculated from this histogram is taken.

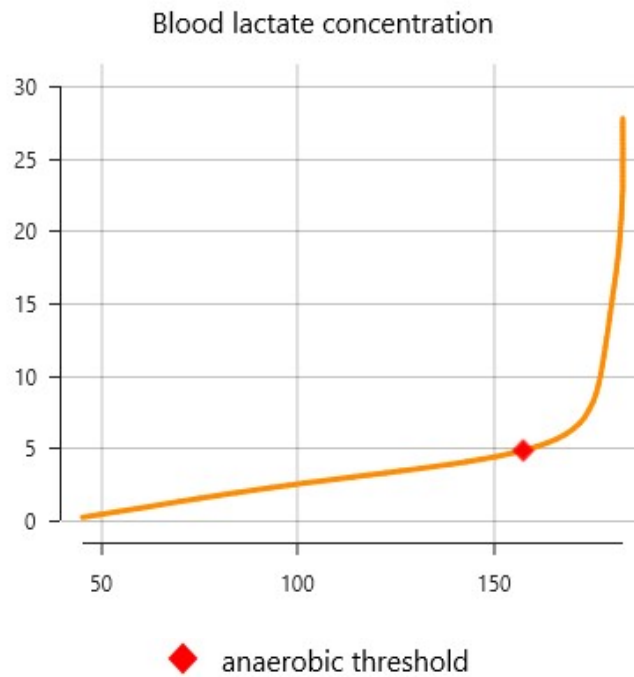
3.2. Maximum oxygen consumption (VO₂ max)²

Name	Value	Standard deviation	Unit
Heart rate	170	±4	beats/min
Oxygen consumption	54,18	±2,92	ml/min/kg
Power	1691	±79	W

²The data on the VO₂ max parameters are probabilistic estimates of the average obtained during the operation of the statistical identification algorithm. The blood lactate value at the point of reaching VO₂ max is indefinite and highly time dependent. Parameters point VO₂ max is the most important characteristics of the peak short-term load.

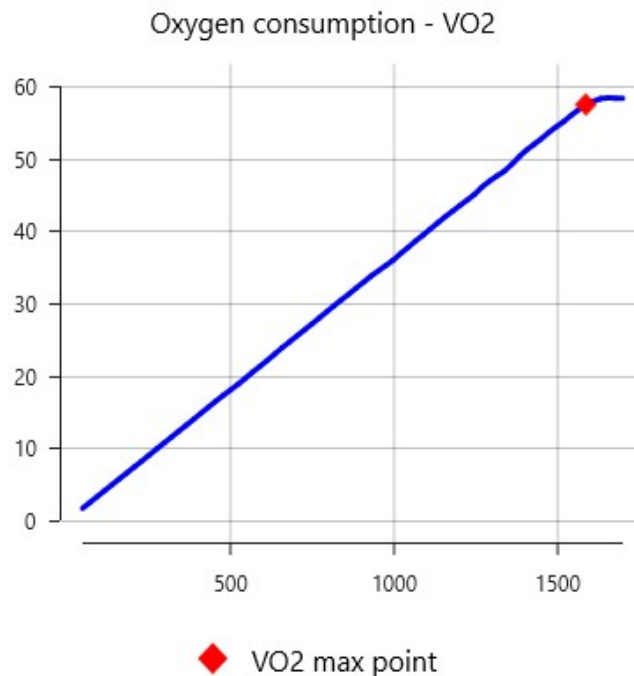
3.3. Individual lactate profile¹

An individual lactate profile is constructed for a step test model with a 10-minute portion of exercise.



¹The individual lactate profile (ILP) is a curve expressing the dependence of the blood lactate level on the heart rate with a stepwise increasing exercise dosage of a certain duration. By the ILP curve, the anaerobic threshold is defined as the break point of the curve from which its non-linear growth begins.

3.4. Individual VO₂ profile²



²The individual VO₂ profile is a curve expressing the dependence of oxygen consumption on physical activity, expressed by the total calorimetric power of the organism. This curve is used to refine the definition of the individual VO₂ max level as the point of termination of the linear growth of VO₂ with an increase in physical activity .