

Important parameters and equations in Physiology

Cellular physiology:

Body water content
Blood volume
Plasma volume
Extracellular fluid volume
Intracellular fluid volume
Interstitial fluid volume
Hematocrit
Hemoglobin concentration
Blood plasma Na^+ concentration
Blood plasma H^+ concentration
Blood plasma K^+ concentration
Blood plasma Ca^{2+} concentration and its fractions
Blood plasma Cl^- concentration
Blood plasma HCO_3^- concentration
Blood plasma protein concentration
Intracellular Na^+ concentration
Extracellular Na^+ concentration
Intracellular H^+ concentration
Intracellular K^+ concentration
Cytosolic Ca^{2+} concentration
Intracellular Cl^- concentration
Intracellular HCO_3^- concentration
Blood plasma osmolarity and oncotic pressure
Resting membrane potential of skeletal muscle cells

Resting membrane potential of neurons
Conduction velocity of different type of nerves
Equilibrium potential of Na^+ in neurons
Equilibrium potential of K^+ in neurons
Equilibrium potential of Ca^{2+} in neurons
Equilibrium potential of Cl^- in neurons

Cardiovascular system:

Duration of PQ interval of ECG (HR=75/min)
Duration of QRS complex of ECG (HR=75/min)
Duration of P wave of ECG (HR=75/min)
Amplitude of ST-segment of ECG
Amplitude of R and T waves of ECG in II. lead
Duration of cardiac cycle (HR=75/min)
Duration of systole (HR=75/min)
Duration of diastole (HR=75/min)
Duration of ventricular ejection (HR=75/min)
Duration of ventricular filling (HR=75/min)
Stroke volume
Systolic pressure in the aorta
Diastolic pressure in the aorta
Systolic pressure in the right ventricle
Diastolic pressure in the right ventricle
Systolic pressure in the left ventricle

Diastolic pressure in the left ventricle
Systolic pressure in the a. pulmonalis
Diastolic pressure in the a. pulmonalis
Central venous pressure
Blood flow of kidney
Blood flow of splanchnic area
Blood flow of brain
Blood flow of heart
Blood flow of skin
Blood flow of skeletal muscles
Cerebrospinal fluid volume
Protein concentration of cerebrospinal fluid
Hydrostatic pressure of capillaries in the arteriolar end and in the venular end
Effective filtration pressure of capillaries in the arteriolar end and in the venular end
Oxygen consumption in 1 minute
AVDO₂ in the systemic circulation
AVDO₂ in the kidney
AVDO₂ in the splanchnic area
AVDO₂ in the brain
AVDO₂ in the heart in resting condition and during physical exercise
AVDO₂ in the skin
AVDO₂ in the skeletal muscles in resting condition and during physical exercise

Respiratory system:

Residual volume

Expiratory reserve volume
Inspiratory reserve volume
Tidal volume
Vital capacity
Total lung capacity
Functional residual capacity
Dead space
Alveolar ventilation
Intrapleural pressure and alveolar pressure during inspiration
Intrapleural pressure and alveolar pressure during expiration
Intrapleural pressure and alveolar pressure at the end of inspiration
Intrapleural pressure and alveolar pressure at the end of expiration
P_{O₂} and P_{CO₂} of the alveolar gas
P_{O₂} and P_{CO₂} in the arteries
P_{O₂} and P_{CO₂} in the veins
Concentration of oxygen in the arteries and in the veins
O₂ consumption in resting condition
CO₂ production in resting condition

Urinary system:

Renal blood flow
Renal plasma flow
Glomerular filtration rate
Filtration fraction

Hydrostatic and colloid osmotic pressures in the glomerular capillaries (afferent and efferent sides)

Hydrostatic and colloid osmotic pressures in the Bowman's space

Effective filtration pressure in the glomerular capillaries (afferent and efferent sides)

Osmotic concentration in the proximal tubule

Osmotic concentration of the interstitium in the cortex

Urine volume (maximal concentration)

Urine osmolarity (maximal concentration)

Urine volume (maximal dilution)

Urine osmolarity (maximal dilution)

Osmotic concentration and composition of the interstitium in the inner medulla during maximal concentration

Transport maximum of tubular glucose-reabsorption

Acid-Base Balance:

Arterial blood pH and pCO₂

Buffer base

Base excess

Standard HCO₃⁻

Actual HCO₃⁻

Gastrointestinal tract:

Pressure values in the different parts of the esophagus

Blood:

Red blood cell count

White blood cell count

Thrombocyte count

Percentage of different white blood cell types

Endocrinology:

Total and ionic Ca²⁺ concentration in the plasma

Basal glucose level in the plasma

Basal Metabolic Rate

Respiratory Quotient (carbohydrate, fat, protein)

Energy content of different foods (carbohydrate, fat, protein)

Nervous system:

EEG: α -wave frequency; β -wave frequency

Refractive power of cornea and lens

Equations:

Body fluid compartments

Blood volume

Equilibrium potential

Cardiac output

Total peripheral resistance

Alveolar ventilation

Dead space

Functional residual capacity

Henderson-Hasselbalch equation

Clearance

RBF, RPF

Filtration fraction

Energy expenditure

Respiratory quotient