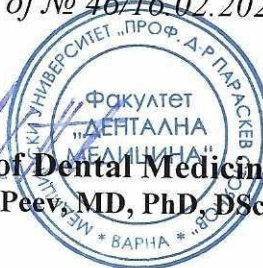




MEDICAL UNIVERSITY
“PROF. DR. PARASKEV STOYANOV” - VARNA
FACULTY OF DENTAL MEDICINE

Approved with a Protocol of № 46/16.02.2022г.

Approved:
DEAN of Faculty of Dental Medicine:
/ Prof. Stefan Peev, MD, PhD, DSc/



EDUCATIONAL PROGRAMME
OF

“HUMAN PHYSIOLOGY”

Specialty “DENTAL MEDICINE”

Educational-qualification degree “MASTER”

Professional qualification “PHYSICIAN IN DENTAL MEDICINE”

	Semester	Horarium weekly	Total horarium
Lectures	III	3	45
	IV	2	30
Exercises	III	2	30
	IV	3	45
Total			150
Monitoring and evaluation forms	Current control		Exam – IV semester
Credits (ECTS)	4+4		8
Extracurricular employment		1	90

Varna, 2022

ANNOTATION:

The aim of the physiology course is to introduce dental students to the vocabulary and concepts dealing with the major cellular processes and organ systems of the normal organism and to explore the homeostatic mechanisms that regulate important parameters of living systems. Areas important for the practice of dentistry are emphasized, including function of oral and facial structures, acts of mastication and swallowing, the secretion of saliva, oral sensitivity, physiology of dental pain, etc. The overall aim is to help dental students acquire a thorough knowledge and appreciation of the function and control of body's systems and ultimately to establish a foundation for the practice of dental medicine.

PLAN OF TOPICS OF LECTURES AND PRACTICAL CLASSES

Lectures III semester

№	Topic	Hours
1.	Physiology - the study of the functions of living organisms. The concept of homeostasis. Control systems of the body – characteristics. Negative feedback nature of control systems. Transport across cell membranes.	1
2.	Physiology of excitable tissues. Membrane potentials – equilibrium potential and resting membrane potential. Types of ion channels. Action potential – mechanisms. "All-or-none" law. Excitability – characteristics in different excitable tissues. Conduction in nerve fibers.	3
3.	Synaptic transmission. Types of synapses. Electrical synapses. Characteristics of transmission in chemical synapses. Neurotransmitters – types, mechanism of action. Neuromodulators. Postsynaptic membrane receptors – types. Postsynaptic membrane potentials. Types of inhibitory circuits.	4
4.	Organization of the nervous system. Functions of the nervous system. Physiology of neuron. Characteristics of nervous circuits. Neuroglia. Processing of information in the nervous system. Role of convergence and divergence. Circular nerve circuits. Inhibition in the CNS – types. Role of inhibition in reflex reactions. Reflex arch – characteristics of transmission. Coordination of reflex reactions.	3
5.	Organization and general features of the autonomic nervous system. Autonomic receptors, neurotransmitters. Effects of autonomic nervous system on organs. "Stress" response of the sympathetic nervous system.	3
6.	Skeletal muscle. Muscle filaments. The neuromuscular junction. Excitation-contraction coupling. Mechanism of muscle contraction. Tetanus. Length-tension relationship. Energetics of muscle contraction. Excitation and contraction of smooth muscle. Control of smooth muscle contraction.	4
7.	Cardiovascular physiology. Circuitry of the cardiovascular system. Cardiac electrophysiology. Autonomic effects on the heart. Electrocardiogram. Cardiac muscle contraction. Contractility; mechanisms affecting contractility. Cardiac output. Frank - Starling relationship. Cardiac cycle. Valves and heart sounds. Regulation of cardiac function. Hemodynamics.	11

	Types of blood vessels. Velocity of blood flow. Pressures in the vascular system. Relationships between blood flow, pressure and resistance. Microcirculation - exchange of substances across the capillary wall. Venous and lymphatic circulation. Mechanisms for control of blood flow. Regulation of arterial pressure. Reflex and long-term regulation of blood pressure. Circulations through special regions: cerebral, pulmonary, coronary, skeletal muscle circulation. Blood supply to the oral cavity.	
8.	Gastrointestinal system. Structure and function of gastrointestinal tract (GIT). Control of gastrointestinal function – innervation, hormones. Physiology of oral cavity - structures, functions. Structure of the tooth. Structure and function of the enamel, dentine, cementum and pulp. Motility – general features. Chewing and swallowing. Characteristics of motility in different regions of GIT. Secretion. Salivary glands. Composition and functions of saliva. Gastric, pancreatic, bile secretion. Digestion and absorption. Functions of the liver. Dietary considerations. Vitamins and microelements.	8
9.	Renal physiology. Structure of the nephron. Renal blood flow, regulation. Glomerular filtration, GFR. Regulation of GFR. Renal clearance. Tubular functions – reabsorption, secretion. Reabsorption of sodium along the nephron. Regulation of sodium balance. Potassium balance. Mechanism of concentration and dilution of urine. Micturition.	5
10.	Body fluids. Distribution of water among the body fluids. Water balance. Regulation of body fluid osmolarity. Acid-Base Balance (ABB). pH of body fluids. Acid production in the body. Basic mechanisms for maintenance of ABB: ECF/ICF buffers, respiratory and renal mechanisms.	3
	Total	45

Lectures IV semester

Nº	Topic	Hours
1.	Heat production and heat loss – mechanisms. Sweat secretion – role, composition. Regulation of body temperature. Fever. Physiology of the skin.	2
2.	Blood - composition, volume, functions. Red blood cells – count, functions. Hemoglobin – types, functions, degradation. Hemoglobin compounds. Regulation of erythropoiesis – role of erythropoietin, vitamin B12, folic acid. White blood cells (WBC) – types, production, functions. Innate and adaptive immunity. Defence mechanisms in oral cavity. Hemostasis. Role of platelets. Mechanism of blood coagulation - pathways. Intravascular anticoagulants. Lysis of blood clot. Blood types. ABO and Rh system. Transfusion, transfusion reactions.	5
3.	Respiratory system – overview. Structure of the respiratory system. Lung volumes and capacities. Mechanics of breathing - respiratory muscles; breathing cycle. Lung compliance - role of intrapleural pressure, surface tension, surfactant. Airway resistance. Gas exchange. Ventilation/perfusion relationships. Factors affecting the diffusion of O ₂ and CO ₂ . Transport of oxygen and carbon dioxide. Control of breathing. Respiratory centers. Receptors involved in the control of breathing. Responses to exercise. Adaptation to high altitude.	5
4.	Endocrine system. Types of hormones, mechanism of action. Control of hormonal secretion. Hypothalamic – pituitary relationships. The pituitary	8

	gland – structure, anterior lobe hormones. Posterior lobe hormones. Thyroid hormones. Adrenal gland – structure, hormones. Physiology of stress. Regulation of calcium and phosphate metabolism- effects of vitamin D, parathyroid hormone, calcitonin. Endocrine pancreas. Pineal gland. Other organs and tissues with endocrine function. Reproductive physiology. Reproductive and hormonal functions of testes and ovaries. 10	
5.	<i>Sensory systems.</i> Sensory pathways. Types of receptors. Processing sensory information. Somatosensory system. Somatic sensations – tactile, position, thermal and pain sensations. Somatosensory pathways. Orofacial and dental pain. Auditory system. Functions of the outer, middle and inner ear. Processing of auditory information. Auditory pathways. Vestibular system. Vestibular organ. Vestibular transduction. Vestibular reflexes. Visual system. Optics of the eye. Accommodation. Errors of refraction. Pupillary reflexes. Photoreception. Optic pathways. Adaptation. Color vision. Eye movements. Chemical senses - taste and smell.	7
6.	<i>Motor systems.</i> Organization of motor function by the spinal cord. Muscle sensory receptors. Spinal cord reflexes. Role of brain stem, cerebellum, basal ganglia and cortex in motor control.	1
7.	<i>Integral functions of the nervous system.</i> Concept of the dominant hemisphere. The neurophysiological basis of learning and memory. Classification of memories. States of brain activity. The electroencephalogram. Brain waves - origin, changes, clinical significance. Activating-driving systems of the brain. Control of cerebral activity from the brain stem. Sleep - types, theories of sleep, physiologic effects of sleep. Behavioral functions of the hypothalamus, hippocampus and amygdala.	2
	Total	30

Practical classes III semester

Nº	Topic	Hours
1.	Homeostasis.	2
2.	Membrane physiology.	2
3.	Nervous system. Reflexes.	2
4.	Autonomic nervous system (ANS).	2
5.	Muscle physiology.	2
6.	<i>Midterm exam I.</i> Membrane physiology. Nervous system. Reflexes. ANS. Muscle physiology.	2
7.	Electrophysiology of cardiac muscle.	2
8.	The electrocardiogram.	2
9.	Mechanical events of cardiac cycle.	2
10.	The cardiac output.	2
11.	The circulation. Regulation of arterial pressure.	2
12.	<i>Midterm exam II.</i> The cardiovascular system.	2
13.	The cardiovascular system and exercise.	2
14.	Gastrointestinal physiology. Balanced nutrition.	2
15.	Seminar.	2
	Total	30

Practical classes IV semester

№	Topic	Hours
1.	Renal physiology.	3
2.	Water and electrolyte balance (WEB).	3
3.	Acid - base balance (ABB).	3
4.	<i>Midterm exam III.</i> Gastrointestinal physiology. Renal physiology. WEB, ABB.	3
5.	Blood: functions, properties, composition and volume. Red blood cells.	3
6.	White blood cells. Plasma. Blood types.	3
7.	Haemostasis.	3
8.	Respiratory system Pulmonary ventilation. Pulmonary circulation.	3
9.	Gas exchange. Regulation of respiration.	3
10.	Energy balance. Endocrine physiology.	3
11.	<i>Midterm exam 4.</i> Blood. Respiratory system. Endocrine system.	3
12.	Sensory systems. Somatic sensations. Taste and smell.	3
13.	Auditory system. Vestibular system.	3
14.	Visual system.	3
15.	Cerebral cortex. Intellectual functions of the brain. States of brain activity.	2
	Total	45

MONITORING AND EVALUATION FORMS:

4 Midterm exams (2/semester)

Final exam – includes test questions (MCQ), practical exam and theoretical exam

REFERENCES:

1. Physiology, Linda Costanzo, 6th Ed, (2018); 7th Ed, (2021); Elsevier
2. Ganong's Review of Medical Physiology, 25th Ed, (2016), 26th Ed, (2019) The McGraw-Hill Companies
3. Human Physiology: From cells to systems, Lauralee Sherwood 9th Ed. (2016) Brooks/Cole
4. Color atlas of Physiology, Stefan Silbernagl, 7th Ed, (2015) Thieme,
5. Laboratory Manual Physiology. M. Stefanova, Antida, 2014.

Department's council protocol № 109/28.01.2022

PREPARED:
/Assoc. Prof. Dr. M. Velikova, PhD/

HEAD OF DEPARTMENT:
/Assoc. Prof. Dr. M. Velikova, PhD/

Examination Syllabus in Physiology for dental students

Theoretical exam

1. Concept of homeostasis. Homeostatic control systems.
2. Cell membranes. Transport of substances through cell membranes.
3. Membrane potential. Resting membrane potential of nerves. Nerve action potential (AP). Propagation of the APs. Conduction velocity.
4. Signal transmission in nerve fibers. Excitation - the process of eliciting the action potential. Threshold for excitation, refractory period. Inhibition of excitability.
5. Organization and functions of the nervous system (NS). Divisions of the NS. Structure of a neuron – role of soma, dendrites, axon, axoplasmic transport. Neuroglia.
6. Synapse – definition, types. Structure of the synapse. Characteristics of transmission in chemical synapses. Effect of drugs on synaptic transmission.
7. Types of receptors in the postsynaptic membrane. Postsynaptic potentials (PSP) – characteristics, types. Ionic basis of PSP.
8. Synaptic transmitters (small molecule transmitters and neuropeptides).
9. Synaptic integration; summation. "Facilitation" and inhibition of neurons. Neuroglia.
10. Neuronal circuits - types of communication, significance.
11. Reflex - definition. Reflex arch. Classification of reflexes.
12. Organization of the spinal cord for motor functions. Types of neurons. Sensory receptors and their role in muscle control. Spinal reflexes.
13. Organization of the autonomic nervous system (ANS). Functions of the ANS. Characteristics of sympathetic and parasympathetic divisions - transmitters, receptors.
14. Sympathetic and parasympathetic tone. Autonomic reflexes. Hormones of the adrenal medulla.
15. Effects of ANS on specific organs. "Stress" response of the sympathetic NS. Control of the ANS.
16. Molecular mechanism of skeletal muscle contraction. The neuromuscular junction (NMJ). Excitation-contraction coupling. Drugs that modify transmission at the NMJ.
17. Energetics of muscle contraction. Types of skeletal muscle fibers. Characteristics of

- whole muscle contraction - types of contractions, gradation of whole muscle tension.
18. Characteristics of smooth muscle. Excitation and contraction of smooth muscle.
 19. Nervous and hormonal control of smooth muscle contraction. Types of smooth muscles.
 20. Physiology of cardiac muscle. Excitation-contraction coupling.
 21. Action potentials (APs) of cardiac tissues. Excitability and refractory periods.
 22. Origin and spread of excitation within the heart. Conduction of the cardiac action potentials. Autonomic effects on the heart.
 23. The electrocardiogram (ECG). Characteristics of the normal ECG. ECG leads. Use of electrocardiography as a diagnostic tool.
 24. Cardiac cycle. Pressure and volume changes in the heart chambers. Cardiac volumes.
 25. Heart valves. Heart sounds. Relationship of the heart sounds to heart pumping. Heart murmurs.
 26. Hemodynamics. Blood flow, pressure, resistance. Laminar and turbulent blood flow.
 27. Functional parts of the circulation. Volumes of blood and pressures in the different parts of the circulation. Velocity of blood flow.
 28. Arterial pressure. Arterial pulse. Transmission of the pulse wave.
 29. Veins and their functions. Venous pressures. Effect of gravity on venous pressure.
 30. Cardiac output (CO). Control of CO by venous return. Frank-Starling mechanism. Factors affecting venous return.
 31. Preload, afterload, contractility. Regulation of myocardial contractility. Inotropic agents.
 32. Cardiac and non-cardiac factors affecting CO.
 33. Structure of the microcirculation. Types of capillaries. Exchange through the capillary membrane. Role of pressures and filtration coefficient.
 34. Local control of blood flow. Control of blood flow by endothelial factors.
 35. Nervous and humoral control of the vascular tone.
 36. Regulation of arterial pressure. Rapid control of arterial pressure. Baroreceptor reflex.
 37. The cardiovascular (vasomotor) center.
 38. Renin-angiotensin-aldosterone system in the control of arterial pressure.
 39. Role of other regulatory mechanisms (receptors, hormones) in the control of arterial pressure.
 40. Lymphatic system – structure, functions. Formation of lymph. Role of veins.
 41. Myocardial oxygen consumption. Coronary circulation. Control of coronary blood flow. Ischemic heart disease.
 42. Gastrointestinal (GI) function - overview. Neural and hormonal control of gastrointestinal function. Enteric nervous system.

43. General patterns of motility. Basic electrical rhythm. Control of motility. Splanchnic circulation.
44. Physiology of oral cavity - structures, functions. Dental tissues. Structure and function of enamel, dentin, cementum and pulp.
45. Gastrointestinal system. Basic digestive processes. Regulation of digestive function.
46. Role of oral cavity and teeth in digestion. Chewing. Swallowing.
47. Functions of the stomach. Motility of the stomach. Vomiting.
48. Movements of the small intestine. Movements of the colon. Defecation.
49. GI secretions - overview, control of secretion. Saliva – secretion, composition, functions, control of secretion.
50. Gastric secretion – composition, functions, control of secretion.
51. Pancreatic secretion - composition, functions, control of secretion.
52. Biliary secretion. Bile - composition, functions, control of secretion.
53. Secretions of the small intestine - composition, functions, control of secretion. Secretions of the large intestine.
54. Basic principles of gastrointestinal absorption. Digestion and absorption of carbohydrates.
55. Digestion and absorption of fats.
56. Digestion and absorption of proteins.
57. Intestinal fluid and electrolyte transport. Absorption of calcium, iron, vitamins.
58. Renal function. The structure of a nephron. Glomerular filtration. Determinants of the glomerular filtration rate (GFR).
59. Renal blood supply. Control of renal blood flow and GFR.
60. Composition of urine. Urinary bladder - structure, innervation. Micturition reflex.
61. Renal tubular reabsorption – transport mechanisms. Reabsorption and secretion along different parts of the nephron.
62. Regulation of tubular reabsorption - glomerulotubular balance, hormonal control.
63. Urine concentration and dilution.
64. Fluid balance - fluid intake and output. Body fluid compartments. Constituents of fluid compartments.
65. Osmolarity of the body fluids. Maintenance of osmotic equilibrium between intracellular and extracellular fluids. Control of extracellular fluid osmolarity.
66. Renal mechanisms for control of sodium excretion and extracellular fluid volume
67. Potassium balance. Regulation of extracellular fluid potassium concentration.
68. Acid base balance – parameters, buffer systems. Respiratory control of arterial pH.
69. Renal control of arterial pH. Acid-base disorders.

70. Blood - functions, composition, volume. Plasma – volume, composition. Plasma proteins – types, function.
71. Red blood cells – count, functions. Hemoglobin – functions, degradation, compounds of hemoglobin.
72. Production of blood cells - hematopoiesis. Role of erythropoietin, vitamin B₁₂, folic acid and iron in erythropoiesis.
73. White blood cells (WBC). Types of WBC. Production, functions. Role of WBC in inflammation.
74. Innate immunity. Adaptive immunity. Defense mechanisms in oral cavity.
75. Events in hemostasis. Role of platelets.
76. Mechanism of blood coagulation. Pathways.
77. Intravascular anticoagulants. Lysis of blood clot. Conditions that cause excessive bleeding, thromboembolic conditions.
78. Respiratory system – functions. Mechanics of pulmonary ventilation. Pressures that cause movement of air. Respiratory muscles.
79. Minute respiratory volume. Alveolar ventilation. Effect of dead space on alveolar ventilation. Compliance, surface tension, surfactant.
80. Function of the respiratory passageways. Control of the bronchial tone. Pulmonary circulation. Control of pulmonary blood flow.
81. Gas exchange. Diffusion of gasses, pressure gradients. Composition of alveolar air. Diffusion of gasses through the respiratory membrane. Factors that affect the rate of gas diffusion. Effect of the ventilation-perfusion ratio on alveolar gas concentration.
82. Transport of oxygen in blood and tissue fluids. Role of hemoglobin in O₂ transport. Oxygen-hemoglobin dissociation curve. Factors affecting O₂ content.
83. Diffusion of carbon dioxide (CO₂). Transport of CO₂ in the blood. CO₂ dissociation curve. Respiratory exchange ratio.
84. Regulation of respiration. Respiratory center. Factors that affect respiration.
85. Chemical control of respiration.
86. Temperature regulation. Balance of heat production and heat loss.
87. Endocrine system - functions. Types of hormones – characteristics and physiologic effects. Mechanisms of hormone action. Control of hormone secretion.
88. Hypothalamus and pituitary gland. Hypothalamic hormones.
89. Pituitary gland – functional morphology. Hormones of the posterior pituitary gland – physiologic effects, control of secretion.
90. Hormones of the anterior pituitary gland - physiologic effects, control of secretion.
91. Growth hormone – physiologic effects, control of secretion. Insulin-like growth factors.

92. Thyroid hormones – synthesis, physiologic effects, control of secretion.
93. Hormones of the adrenal cortex - physiologic effects, control of secretion.
94. Hormones of the adrenal medulla - physiologic effects, control of secretion.
95. Energy balance. Metabolic rate. Regulation of food intake.
96. Carbohydrate metabolism. Role of glucose – transport, utilization, storage, production.
Control of blood glucose concentration.
97. Lipid metabolism. Transport of lipids. Fat deposits. Hormonal regulation of fat storage and fat utilization. Risk factors for atherosclerosis.
98. Protein metabolism. Transport of amino acids in the intestines and renal tubules.
Nitrogen balance. Hormonal regulation of protein metabolism.
99. Pancreatic hormones and their role in the control of fuel metabolism. Metabolic effects of growth hormone, cortisol and epinephrine.
100. Liver functions.
101. Role of vitamins and minerals.
102. Calcium and phosphate metabolism. Bone physiology.
103. Control of calcium and phosphate metabolism– role of vitamin D, parathyroid hormone, calcitonin.
104. Reproductive functions of the male. Spermatogenesis. Functions of the components of the male reproductive system.
105. Testosterone and other male sex hormones – secretion, physiologic effects, control.
106. Reproductive functions of the female. Ovarian cycle. Endometrial cycle and menstruation. Regulation of the female monthly rhythm.
107. Ovarian hormones – secretion, physiologic effects, control of secretion.
108. Fertilization. Hormonal factors in pregnancy. Parturition. Lactation.
109. Sensory systems – organization, functions. Sensory pathways. Role of thalamus.
110. Steps in processing sensory information. Sensory receptors – types. Transduction of sensory stimuli into nerve impulses.
111. Somatosensory system. Types of somatosensory receptors. Mechanoreceptors, thermoreceptors. Position senses. Somatosensory pathways. Somatosensory cortex.
112. Pain. Types of pain. Nociceptors. Pain suppression system.
113. Referred pain. Visceral pain. Headache. Orofacial and dental pain.
114. Visual system. Structure of the eye. Accommodation. Errors of refraction. Control of accommodation and pupillary diameter.
115. Receptor and neural function of the retina. Structural elements of the retina. Steps in photoreception. Color vision.
116. Neural circuitry in the retina. Visual pathways. Visual cortex.

117. Auditory system. Conduction of sound to the cochlea. Structures of the ear.
118. Auditory transduction. Organ of Corti. Determination of sound frequency and loudness.
Auditory pathways. Olfactory receptors, olfactory pathways.
119. Vestibular system – vestibular organ, vestibular transduction, pathways.
120. Sense of smell. Sense of taste. Receptors, sensory transduction, pathways.
121. Motor systems. Function of spinal cord, brain stem, cerebellum, basal ganglia, and cerebral cortex in motor control.
122. States of brain activity. Control of cerebral activity from the brain stem. Sleep - types, sleep stages. Physiologic effects of sleep.
123. Electrical activity of the brain. Brain waves. Electroencephalography - clinical significance.
124. Role of limbic system and higher cortex in control of emotions and motivation.
125. Learning and memory. Types of memory. Role of hippocampus, cerebellum, cortex.
126. Cardiovascular system, respiration, muscle activity, body fluids, body heat in exercise.

Practical exam

1. Reflex testing. Deep tendon reflexes. Superficial reflexes.
2. Orthostatic test. Heart rate response to deep breathing.
3. Cardio-inhibitory reflexes. Sustained isometric handgrip test.
4. Electromyography. Nerve conduction velocity test.
5. Electrocardiography. The 12 lead ECG.
6. Determination of heart rate and heart rhythm. Determination of the mean electrical axis.
7. Interpretation of a normal electrocardiogram.
8. Auscultation of heart sounds. Phonocardiography. Heart murmurs.
9. Blood pressure determination.
10. Effects of postural changes on blood pressure. Valsalva maneuver.
11. Assessment of arterial pulse. Sphygmography. Photoplethysmography.
12. Assessment of myocardial function. EF. Echocardiography. Evaluation of left ventricular function.
13. Functional tests assessing the cardiovascular response to exercise.
14. Cycle ergometer submaximal graded exercise test – clinical application.
15. Designing a balanced daily diet.
16. Renal clearance. Methods to estimate glomerular filtration rate.
17. Methods to estimate renal plasma flow and renal blood flow.

18. Assessment of acid-base balance (ABB). ABB parameters.
19. Assessment of plasma osmolarity and body fluid volume.
20. Estimation of blood volume. Hematocrit determination.
21. Hemoglobin determination.
22. Red blood cell count. Red blood cell indices.
23. White blood cell count. White blood cell differential count.
24. Total serum protein test. Hemolysis.
25. Erythrocyte sedimentation rate.
26. Blood type testing. ABO and Rh typing. Pretransfusion compatibility testing.
27. Platelet count. Bleeding time tests. Coagulation time tests.
28. Prothrombin time (PT). Activated partial thromboplastin time (aPTT).
29. Spirometry. Lung volumes and capacities.
30. Minute ventilation, alveolar ventilation, dead space ventilation.
31. Factors, affecting oxygen content (CaO_2), oxygen saturation of hemoglobin (SaO_2) and arterial PO_2 .
32. Body mass index. Waist-hip ratio (WHR). Estimation of body fat.
33. Indirect calorimetry. Measurement of energy expenditure. Calculation of total energy expenditure.
34. Measurement (calculation) of basal metabolic rate. Factors, affecting BMR.
35. Sensory system examination.
36. Hearing testing. Tuning fork tests. Audiometry.
37. Assessment of coordination and gait. Balance evaluation.
38. Testing extra-ocular movements. Assessment of pupil reactions.
39. Assessment of visual acuity. Ophthalmoscopy.
40. Visual field testing - perimetry. Assessment of color vision.
41. Electroencephalography. Brain waves.