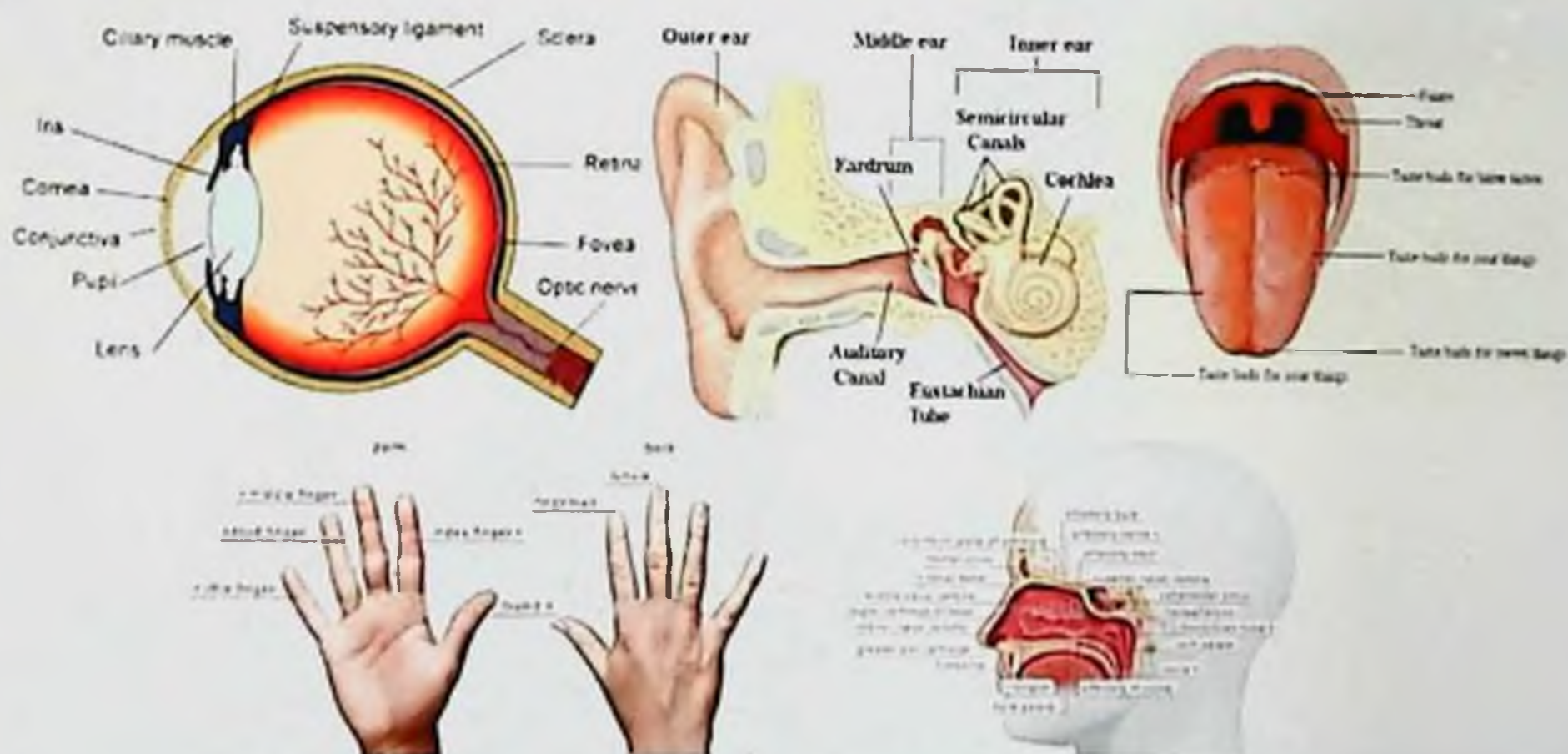


E.U. Khusanov, L.M. Kurbanova, G.R. Kholyarova

FUNCTIONAL ANATOMY OF ORGANS SENSES

For the independent training of students of medical higher educational institutions teaching and methodological manual

Sense Organs



MINISTRY OF HIGHER EDUCATION, SCIENCE AND INNOVATION
OF THE REPUBLIC OF UZBEKISTAN

MINISTRY OF HEALTH
OF THE REPUBLIC OF UZBEKISTAN

SAMARKAND STATE
MEDICAL UNIVERSITY

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institutions teaching and methodological manual

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Samarkand-2024

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This methodological indication is intended for students of the medical and pediatric faculties to master human anatomy according to the structure of the senses with a more complex construction for easier assimilation. The growth of the child's body in it changes that occur in the process are analyzed after studying the adult anatomy of a person. The authors apply this methodological instruction to students in the independent work of human anatomy and gives them the opportunity to study this section of the science of human anatomy. It helps in the absorption of the sacrificial anatomy of the senses. The methodological guidelines of the medical and pediatric faculties are structured in accordance with the program on the subject of human anatomy.

Introduction

This methodological indication is intended for students of the Faculty of Medicine and Pediatrics to assimilate more complex structures of the senses with quickly understandable anatomical terms for easy assimilation. The growth of the child's body in it occurs many changes that should be studied in the analysis process after studying the adult anatomy of a person. The methodological instruction is shown for medical students of the medical and pediatric faculties and is based on the working program on the subject of human anatomy as follows:

1. Purpose and objective of training.
2. What a student should know about this topic.
3. What practical knowledge a student should have on this topic.
4. What important questions a student should be able to answer.

The authors apply this methodological instruction to students in the independent work of human anatomy and gives them the opportunity to study this section of the science of human anatomy. It is believed that it helps the rapid and easy absorption of sensory organs.

The senses perceive the energy of external influence as a nerve impulse rotation is transmitted to anatomical structures that deliver it to the brain. Intuition through the senses of a person perceives the external environment, adapts to it and reacts to the impact by a certain action. Various effects of the skin, perception by the organs of vision, hearing and balance, smell and touch will be done. Some external influence is felt when you directly touch the object: the skin feels (pain, temperature), complete cognition. Such senses are called contact senses. Other effects are felt from a certain distance: the eye organ picks up light, the hearing organ picks up sound, the smell organ picks up different smells. Such organs are called remote senses. The adoption of influences, transmission and analysis of the sum of nerve elements involved in the engagement I.P. Pavlov calls the analyzer. The analyzer of the complex impact of the environment is divided into separate elements. The analyzer consists of three parts:

1. Peripheral receptor part receives energy of chemical and physiological action of nerve excitation.
2. The conductive conductor part transmits excitation from the receptor under the cortex to the centers, and then the hemispheres are transferred to the cortex.
3. incoming excitations in the center of the analyzer cortex analysis of communication with other centers.

Topic: "Organs of vision. Structure of the eyeball and changes with age. Auxiliary apparatus of the eye. Their change with age. Mode of vision transmission. II pair of cranial nerves. "

1. Duration of practical work - 4 hours

2. Purpose of practical training:

- Eyeball - discussion with students of the anatomical structure of the eyeball, the auxiliary apparatus of the eye and the guiding pathways of the eye.
- Showing the folds of the eyeball, internal structure, eye muscles, tear apparatus and eyelids on museum preparations, dummies and tablets.
- Discussion of ocular pathways.
- Explanation of image formation, formation of light-receiving and visual objects.

3. Practical training tasks:

- Be able to pronounce the Latin names of the layers of the eyeball, the internal structure of the eyeball, the lacrimal apparatus and muscles based on the new anatomical nomenclature.
- Be able to show the creases of the eyeball, the internal structure of the eyeball, the lachrymal apparatus and muscles on anatomical preparations, mannequins and drawings.
- Give eye vision
- Explanation of the mechanism of vision.
- Explanation of the main symptoms in the involvement of the organs of the eye based on their anatomical structure.

4. Rationale for the topic:

- Parts and structure of the visual organ.
- Eyeball folds.
- Auxiliary apparatus of the eye.
- Structure of the visual pathway.

5. The equipment of the practical lesson:

1. The Eye of Cattle.
2. Dummies with an auxiliary apparatus of the eyeball.
3. Table of sagittal incision of the eye.

4. Diagram of the visual path.
5. The drug is the base of the brain.
6. Skull.
7. Layout of conductive paths.
8. International anatomical terminology.
9. Anatomical Table Pies.
10. Presentation of the lecture.
11. Video lectures.

6. form of training:

Individual work, working with a group, working with a team.

7. training conditions:

Auditoria, "Peripheral nervous system" thematic room, Anatomical table Pies.

8. monitoring and evaluation:

- oral

- test

9. Motivation:

This topic is an area of medical practice, in which various diseases for the organs of vision are often investigated, diagnosed and treated. Knowledge of the anatomical structure of the region, the anatomical names of these organs, as well as international anatomical terms, is a deep basis for the subsequent development of clinical sciences. It is impossible to become a good doctor without mastering this subject.

10. Interdisciplinary and intra-subject connections:

The teaching of this subject mainly includes normal anatomy, histology, normal physiology and neurology, psychology with information based on ophthalmology. The knowledge gained during the lesson will be needed when assimilating the foundations of all clinical areas.

11. Analytical part:

- Survey the group on the topic and rate it on a 100-point system.
- Discussion of test questions on this topic from the module.

12. chronological map of practical training:

Time - 4 hours

1. Check attendance-5 minutes.
2. Fixing the past topic. - 10 min.
4. The topic in Pirogov's office, museum preparations, dummies, tables - 30 minutes.
5. Explanation of the topic using an electronic multimedia textbook, an electronic Atlas in Pirogov's room - 25 minutes.
7. Independent work - 10 minutes
8. Students independently prepare for a practical lesson. - 10 min.
9. Break - 15 minutes.
10. Continue preparing for the practice yourself - 15 minutes
11. Discussion of the problem on the topic - 35 minutes.
12. Study of terms on the topic from the Latin-Uzbek-Russian dictionary of terms "international anatomical terminology" - 15 minutes.
14. The answers to the test questions are 20 minutes.
15. The announcement of the next topic is 5 minutes..

Data block:

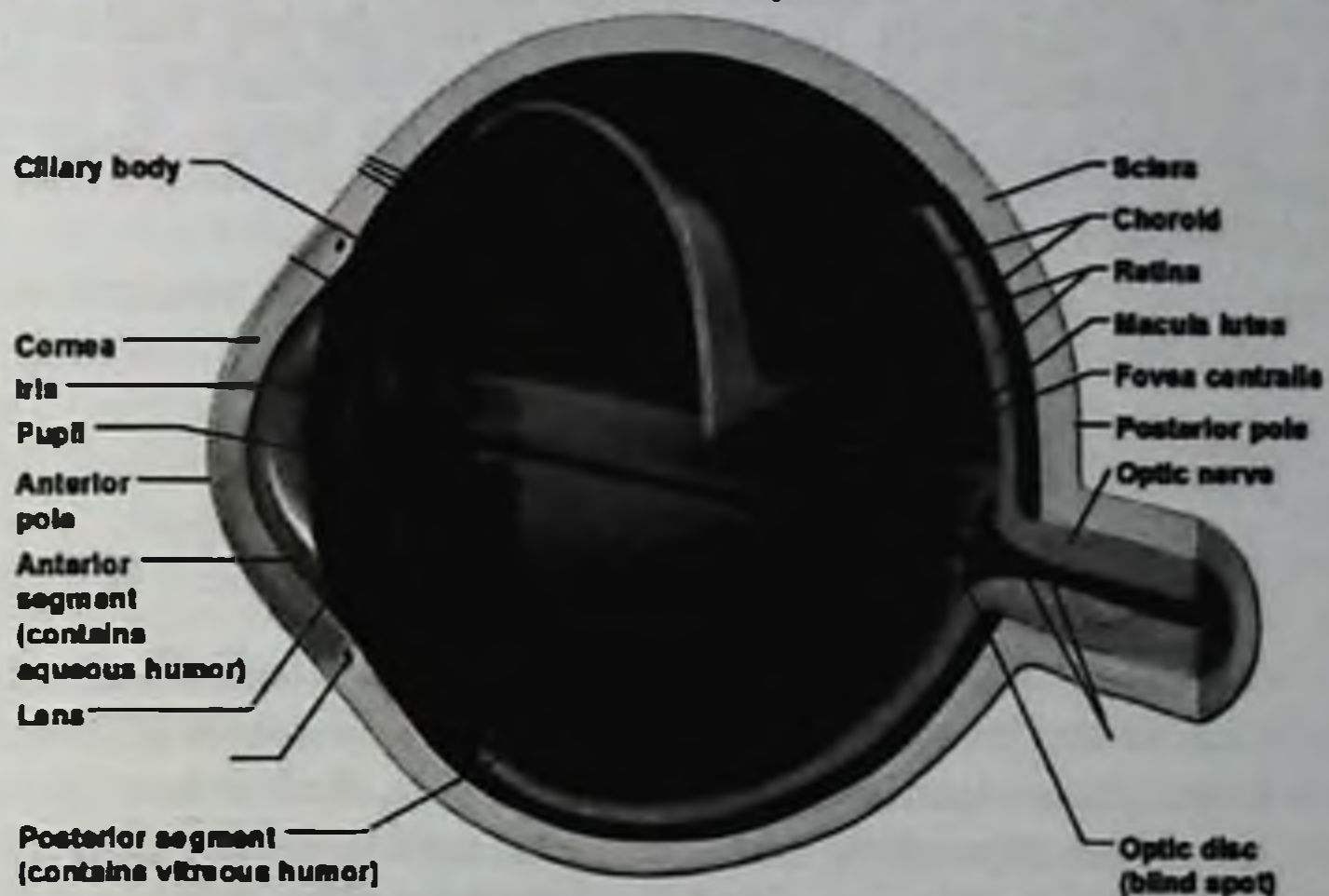
The normal functioning of the child's visual system is a necessary condition not only for ensuring the visual process itself, but also for the development of all organs and systems of the body, since the eye is not only an organ of vision, but also a "consumer" of light energy. Due to the stimulating effect of light in the body, the glands of internal secretion produce hormones of the pituitary gland, adrenal glands, thyroid gland, genital glands, etc. The faster adaptation of the newborn's body to external conditions, its correct development and growth depend to a large extent on the correct functioning of the visual system. That is why the visual analyzer in children is formed quickly enough. The growth and development of the child's eye is mainly completed by 2-3 years, and in the next 15-20 years there are fewer changes than in the first years.

The visual organ (visus organ) is located in the eyeball, the eyes and eyes consist of auxiliary members. Oculus consists of the eyeball and optic nerve.

The eye of a newborn has a significantly shorter anteroposterior axis than that of an adult (approx. 16-18 mm) and, accordingly, a higher (80,0-90,9D) refractive force. By the year, the anteroposterior size of the child's eyeball increases to 19.2 mm, by the 3rd years - to 20.5 mm, by the 7th - to 21.1 mm, by the 10th - to 22 mm, by the 15th years it is

about 23 mm and by 20-25 - about 24 mm. However, the size and shape of the eyeball depend on the type and magnitude of a particular type of refraction (refraction disorders - myopia, hypermetropia, normal refraction - emmetropia). The size of the child's eyeball is of great importance in assessing the type and stage of ocular pathology (congenital glaucoma, myopia, fig. - 1).

Anatomy of the Eyeball



Diagrammatic view. The vitreous humor is illustrated only in the bottom part of the eyeball.

Fig. 1. Newborn eyeball.

The eyeball (bulbus Oculi) has a rounded shape. Its anterior pole when it meets the most prominent part of the cornea, the posterior part is located laterally to the exit region of the optic nerve. The line connecting these two points of the so-called outer axis of the eye is 24 mm long. Its posterior cornea the longitudinal part of the retina is called the inner axis of the eyeball, length 21.75 mm. The optical axis of the retinal eyeball from the anterior pole to the central cavity of the curtain. The vertical size of the eyeball is 23.5 mm, transverse 23.8 mm (Fig. 1). The eyeball consists of three layers of veil surrounding the inner environment of the eye. The outer fibrous membrane (tunica fibrosa bulbi) is double, having a protective function: the anterior part is transparent and slightly convex, part of the cornea (cornea) and the large part behind consists of a whitish shell (sclera) consisting of dense connective tissue. They're in the middle with a not-so-deep rotating saddle. With the cornea a narrow circulating Vienna filled with venous blood inside a whitish veil on the border there is a sinus (helmet canal).

The middle choroid (tunica vasculosa) is rich in blood vessels and pigment. It consists of three parts located under a snow-white veil:

1. The private chorioidea forms a large posterior region. There is a slit-like space between it and the whitish veil.

2. The ciliary body (corpus ciliare) with thickening of the choroid in the area of transition of the cornea to the sclera is located in the form. Its rear part is closed, forming a ciliary circle. It penetrates the choroid. And on the front, a colourful curtain on the outside attaches to the edge. Before the ciliary circle, it forms about 70 radially oriented ciliary outgrowths. Inside them, the vascular nets that form the chamber's eye produce their fluid. Cilia in radial, meridian and circular directions, which accommodate the eye inside the ciliary body, the muscle is located.

3. variegated veil (iris) - the front of the vascular veil. It circles in the shape of a pupil (pupilla) in the middle. In it, the pupil of the edges facing the body, with eyelashes and eyelashes, differ. The colored veil contains a pigment, the amount of which determines the color of the eyes. Inside the colorful veil, the pupil is wrapped in a ring, a pupil clamp and a radially located pupil extension muscle is located.

The inner lining of the eyeball - retina (retina) attaches to the inner side of the choroid. The retina has an outer pigment layer and the inner photosensitive nerve part will vary. Radiation light passes through the retina depending on the sensory activity of the posterior seer and the anterior blinds are divided into sections. The light in the visual part of the retina is sensitive elements of rods and cones. The eye of a living person is the eyeball in the back of the retina when viewed under an ophthalmoscope, a whitish spot about 1.7 mm in diameter at the bottom, the optic nerve of the retina, in the center of which is the center of the retina, the artery entering the retina is visible. On the sides of it in the area of the posterior pole is a yellow spot and its central notch is visible. Only in the Central Depression, retinas collected in the bundle are considered the best field of view.

The photoreflexive apparatus of the eye includes the cornea, iris and vitreous body. The iris (lens) is a convex blood vessel on both sides is not transparent like a lens, the front and back poles and the equator of the edge to which the surfaces attach differ. The transparent elastic iris is covered with a sac on the outside and attached to the ciliary body by means of ciliary bundles. Between the fibers of the synchone lobe is a fluid-filled Petit channel. added to the camera. The vitreous ("Corpus vitreum") posterior part of the shell is on the lateral side. It from a dark mass without transparent blood vessels and nerves consists of. Its ability to refract the light of the eyeball chamber fluid is close to the indicator. The front camera with a back surface of a cornea in the middle of a colourful veil. In a junction of a cornea and coloristic curtains the front camera is limited to an edge shoot which

fibers between them are fantonovsky space. The back camera with a colourful blind it is located in the middle and connected to the front camera through a pupil. Chamber liquid feeds a mucous membrane and a cornea.

At newborns eyeball rather big. The cornea rather wide and flat snow-white veil is thinner, than a prozhilkovy veil of an air shade it is visible, giving. In a venous veil of a little color substance, and she fresh at newborn children of an eye gray or bluish. Continuous color 2 appears at young people because muscles of a pupil are badly developed a pupil narrow. The iris of the eye has spherical shape. He quickly in the first year of life of the child grows. The eyeball and the parts making it are the first parts of the life of the child, quickly grows in a year, then slows down.

Four direct and two slanting cross ledges of an eyeball of a muscle move. All straight line and the upper oblique muscle from the general ring of tendons attached to a bone and a bone cover around the visual channel begins. It is also the muscle raising an upper eyelid over a ring of a popliteal tendon begins. The top, lower, side and medial straight lines of an eyeball of a muscle go along walls of an eyeball and a short ring mediate the Horn he is attached to a skler on 5-8 mm behind edge of a curtain. Direct muscles moving an eyeball around a vertical and horizontal axis, the pupil addresses to that party. The upper oblique muscle from above and a medial straight line over an eyeball, passing on the coil directed between muscles it is attached to a side surface behind the equator at once. The lower oblique muscle of a nose a bend up and back, beginning near an opening of a plaintive channel the orientation attaches an eyeball to a side surface behind the equator. Top the oblique muscle turns an eyeball and a pupil down and sideways, the lower muscle turns up and sideways.

The upper and lower eyelid is the skin covering an eyeball in front. these are folds. The front surface a century with thin skin, to an eyeball the turned back surface is covered with a conjunctiva. Free pumpkins on edge are located 2-3 rows of eyelashes. Density in pods the layer of connecting fabric similar to an eyeball layer. the rotary muscle of a bowl, bunches of tendons of the muscle raising an eyelid and blood vessels are located. Meybomi about the rear edge an age of a time of glands open. edges of the lids medial and side sideways connect, forming soldering a century.

The conjunctiva consists of light pink connecting fabric eyelids from within parts of covers and an eyeball disperse. An eye the plaintive device consists of plaintive gland and output tubes. Tears of iron represents difficult alveolar tubular gland. He is located

sideways from the top wall of an eyeball. the teardrop in a corner is in deepening of gland. I separated from gland liquid to wash out a front part of an eyeball on an edge of the lids falls into a medial corner of an eye towards the plaintive lake. Tears from him through the tubes he gets to a plaintive bag. From a plaintive bag a nose - the plaintive tube opens in the lower nasal course. Tears of 99% of its structure it is the share of water, and 1% - of inorganic compounds table salt, an epithelium, protein, consists of slime. He also contains bactericidal substance лизоцин. An eyeball vagina with attached to the head sklery outside of an eyeball or the wrapped-up bag with thorns. Episklernalny between sklery and a shipovidny bag is a gap. An eye space between a bag with thorns and a bone cover he is filled with a fat body which works as an elastic pillow for apples. The way of transfer of sight consists of the IV neuron. The I neuron of a retina consists of sticks and sausages. The nervous impulse of II formed in them ганглиоз at which the neuron passes into bipolar cages, forming of them the neuron of III passes into cages. The sight formed by outgrowths of gangliozny cages a nerve leaves in a skull cavity via the channel of the same name. In a skull cavity on a first line of the Turkish saddle nervous fibers partially intersect, forming an optic nerve forms crossing. On crossing of a retina of the right and left eye the fibers going from a medial half are involved. A lateral part of a retina on the other hand, the fibers going from cross section remain on the party and participate in cross section they won't make it. The formed visual path under bark was formed the centers of sight the side knee joint comes to an end with a small pillow of a trunk and visual camber. Under bark the neuron of IV formed by outgrowths of cages of the visual centers is internal the head, creating the visual radiation passing through hinder legs of a bag, the brain is located on a medial surface of an occipital share in a cerebral cortex comes to an end in the center of sight. The muscles of the eyeball in newborns are well developed, except for the lobar part. Their coordinated movement begins when the child turns 2 months old. Autumn comes out for a child when he starts 2 months. The lacrimal gland is small, the outlet tubules are narrow. The nasolacrimal tube is wide and short. The newborn cleft in the eye is narrow, twisted in the medial corner.

Self-Training Questions

- 1. What is the structure of the eyeball?**
- 2. What is the structure of the fibrous membrane?**
- 3. What parts of the venous vein?**
- 4. Describe the structure of the ciliary body.**

5. Describe the structure of the iris.
6. To what is the structure of the retina?
7. What is seen under the eyeball?
8. What is included in the light-refracting apparatus of the eye?
9. Feature of the eyeball in children.
10. What is included in the musculoskeletal system of the eye?
11. Describe the activity of the eye muscles.
12. How are the eyelids arranged?
13. What is included in the lachrymal apparatus?
14. Describe parts of the visual pathway.
15. Characteristics of the auxiliary apparatus of the eye in children.

Test questions

1. Which senses are contact organs?
 - A. Rust, taste
 - B. Kozha, taste
 - C. Sluch, skin
 - D. Flavor
 - E. Skin
2. Remote senses?
 - A. Sluh, vision, skin
 - B. Skin, Smell, Smell
 - C. Sluch, vision, taste
 - D. Smell, smell, hearing
 - E. Sluh, sense of smell, skin
3. What parts does the visual organ consist of?
 - A. Eyeball, muscles
 - B. Eyeball, optic nerve
 - C. Auxiliary organs of the eye and eyeball
 - D. Ocular and lacrimal apparatus
 - E. Eyeball and lacrimal gland
4. Which layers make up the eyeball?
 - A. anterior, medial, posterior
 - B. fibrous membrane, vascular membranes, retina
 - C. tunica externa, media, interna
 - D. anterior sheath, choroid
 - E. cornea, body, iris
5. Which parts of the fibrous membrane?
 - A. anterior, medial, posterior

- B. cornea, choroid
 - C. cornea, sclera
 - D. Sklera, retina
 - E. cornea, iris
6. What parts does the choroid of the eyeball have?
- A. choroid, cilia body, iris
 - B. sclera, cilia, iris
 - C. choroid, cornea, iris
 - D. choroid, retina, iris
 - E. cilia corpus, iris, retina
7. Features of the cornea of the newborn's eye?
- A. Широкий и толстый
 - B. Thin and narrow
 - C. Thin and flat
 - D. Wide and flat
 - E. Narrow and thick
8. What parts is the retina divided into?
- A. pigment layer, pars Optica
 - B. pars caeca, retina
 - C. pars caeca, layer pigment
 - D. Pars optica, pars caeca
 - E. pars optica, retina
9. What is included in the light-refracting apparatus of the eye?
- A. Cornea, vitreous, chamber fluid
 - B. Iris, cornea, whitish membrane
 - C. Iris, cornea, vitreous
 - D. Vitreous, retina
 - E. Iris, cornea, crystal
10. Where is the anterior chamber of the eye?
- A. Between cornea and cornea
 - B. Between cornea and iris
 - C. Between cornea and whitish veil
 - D. Between iris and retina
 - E. Between cornea and retina
11. What is included in the eye aid?
- A. Muscles, lacrimal apparatus, eyelashes
 - B. Eyelids, muscles, conjunctiva, eyebrow
 - C. Muscles, eyelids, lacrimal apparatus, conjunctiva
 - D. Conjunctiva, lacrimal apparatus, eyelashes
 - E. Eyelids, lacrimal apparatus, conjunctiva, eyebrow
12. What is included in the tear apparatus?
- A. Lacrimal gland and lake
 - B. Lacrimal gland and discharge tubes
 - C. Lacrimal gland and sac
 - D. Tear Canal and Lake

- E. Tear tubes and pouch
13. Where is the neuron 4 of the visual pathway?
- A. Ganglion cells
 - B. Lateral knee on torso, pillow
 - C. On medial knee, on four hills
 - D. quatrains on lower mounds
 - E. Bipolar cells
14. What are the oblique muscles of the eyeball?
- A.m.rectus inferior et m.obliquus inferior
 - B.m.obliquus inferior et rectus superior
 - C.m.obliquus superior et inferior
 - D.m.obliquus superior et rectus medialis
 - E.m.rectus lateralis et obliquus inferior
15. Straight eye muscles - which ones?
- A.m.rectus superior et medialis
 - B.m.rectus inferior et obliquus inferior
 - C.m. rectus medialis et m.obliquus superior
 - D.m.obliquus inferior et m. rectus lateralis
 - E. m.rectus lateralis et m.obliquus superior
16. Where is the rear camera of the eye?
- A. Wait for iris and lens
 - B. Wait for Rajuka and Cilia
 - C. Near cornea and iris
 - D. Near Rajuka and Vitreous
 - E. Between iris and cilia
17. How is the lens covered on top?
- A.Capsula lentis
 - B.Sorpus vitreum
 - C.Orbiculus ciliaris
 - D.Tunica vasculosa
 - E.Humor aquosus
18. Which muscles change pupil size?
- A.M.spinker and pupil dilator
 - B.M.spinker and lifting pupils
 - C.M.spincter et depressor pupillae
 - D.M.cilia et dilating pupils
 - E.M.cilaris et spincter pupilae
19. What is the function of the cilia muscle?
- A. Fastens the lens
 - B. Produces liquid
 - C. Lens Administration
 - D. Expands the lens
 - E. Cutting the lens
20. What forms the third neuron of the visual pathway?
- A. Nuclear cartridges

- B. Kolbochko Nuclear
- C. Bipolar cells
- D. Angliose cells
- E. Eerecrest of optic nerve

Topic: "Hearing organs. Functional and age anatomy of the outer and middle ear. Inner ear. Transmission path of auditory and balance analyzers. VIII pair of cranial nerves. Skin and its derivatives: hair, nails, mammary gland. Taste and smell analyzers. I- A pair of cranial nerves. "

1. Duration of practical lesson - 4 hours

2. Purpose of practical training:

- With students, study the structure of the outer, middle and inner ears.
- Showing parts of the outer, middle and inner ear in museum preparations, mannequins and paintings.
- Sound perception and statokinetics explain how the analyzer works.
- Overview of hearing transmission pathways and statokinetic analyzer.

3. Practical lesson tasks:

- Be able to pronounce the names of the ear, middle and inner ear in Latin based on the new anatomical nomenclature.
- Be able to show parts of the outer, middle and inner ear on anatomical preparations, mannequins and images.
- The conducting paths of auditory and statokinetic analyzers can be called Latin.
- Explanation of sound perception based on its anatomical structure.
- Explanation of the main symptoms of damage to the organs of sound transmission and perception based on their anatomical structure.

4. Rationale for the topic:

- Parts and structure of the auditory and equilibrium organ.
- External ear structure.
- Middle ear structure.
- Interior structure of the ear.
- Conduction pathways of auditory and statokinetic analyzers.

5. The equipment of the practical lesson:

1. Chamber bone.
2. Preparations of the bone labyrinth and membranous labyrinth.
3. Dummy hearing organs.
4. Layout of hearing organs.
5. The brain with a diamond-shaped fossa in the sagittal section.
6. Path Layout
7. "International Anatomical Terminology."
8. Anatomical Table Pies.
9. Presentation of the lecture.

6. form of training:

Individual work, working with groups, working with a team.

7. Training conditions:

Auditoria, "Peripheral nervous system" thematic room, Anatomical table Pies.

8. Monitoring and evaluation:

- oral

- test

9. Motivation:

This topic is an area of medical practice, in which various diseases are often investigated, diagnosed and treated. Knowledge of the anatomical structure of the region, the anatomical names of these organs, as well as international anatomical terms, is a deep basis for the subsequent development of clinical sciences. It is impossible to become a good doctor without mastering this subject.

10. Interdisciplinary and intra-scientific connections:

The teaching of this subject mainly includes normal anatomy, histology, normal physiology and neuropsychology, ENT with information based. The knowledge gained during the lesson will be needed when mastering the foundations of all clinical areas.

11. Analytical part:

- Ask a group on a topic and rate it on a 100-point system.
- Discussion of test questions on this topic from the module.

12. Chronological map of practical training:

Time - 4 hours

Time - 4 hours

1. Check attendance-5 minutes.
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12. Study of terms on the topic from the Latin-Uzbek-Russian dictionary of terms "international anatomical terminology" - 15 minutes.
14. The answers to the test questions are 20 minutes.
15. The announcement of the next topic is 5 minutes.

Data block:

The pre-circulatory organ of hearing and equilibrium (organum vestibulocochlearae) is interconnected in structure and functioning, consisting of three parts: the outer, middle and inner ears. The external and middle ear in its function belongs to the auditory organ (Fig. 2).

The outer ear (auris externa) from the upper ear and external ear canal consists of. the auricle (auricle) consists of an elastic ridge covered with skin and has a complex shape. The fat in the uncle's place at its bottom is a soft part with a texture above the ear and has a bulge. above the ear, the free edge of the bowstring twists and forms a fold. Its front part of the task ends with a folding leg above the ear canal. In the fold in parallel direction there is an opposite fold, between which there is a groove. The eardrum in front of the external auditory canal and the opposite eardrum settled, a shell pit forms between them. The external auditory canal (meatus acusticus externa) has an S-shape and an average of 35 mm in length. 1/3 its-bone, and 2/3-bone. It with skin on the skin of the cover part is located serum glands. The external ear canal has an oval shape, separating it from the tympanic cavity

dimensions 11x9 with an tympanic membrane (membrane tympanic membrane) mm end. The lower wide part of the eardrum is stretched, the upper small (2 mm) part is called the empty part. There is a navel of the eardrum sunk in the middle of it. The fibrous layer on the tense part of the eardrum is the skin on the outside, it is covered with mucous membrane on the inside. And in the blank only the skin and mucous membrane will be.

The middle ear (auris media) includes the eardrum cavity and the auditory canal enters. The tympanic cavity is located inside the pyramid of the temporal bone. covered with mucous membrane, size 1 cm³ space, equal to six walls of variation:

1. Thin bone, the upper wall of which forms the roof of the drum cavity consists of a plate.
2. The wall of the pyramid facing the lower flirty Vienna yoke corresponds to the region of the notch.
3. There are oval and round holes in the wall facing the medial labyrinth.
4. On the back suction cup, the stirrup muscle, which begins the pyramidal hill and the suction cup h'or are located.
5. The front wall of sleep separates the tympanic cavity from the carotid canal. In its upper part is the internal opening of the ear canal.
6. the side wall is formed by an eardrum. In the cavity of the eardrum there are three auditory bones: a hammer, a grinding machine and a stirrup are connected to each other. the eardrum is inserted to form a chain extended through the curtain into the oval opening.

Anatomy of human ear

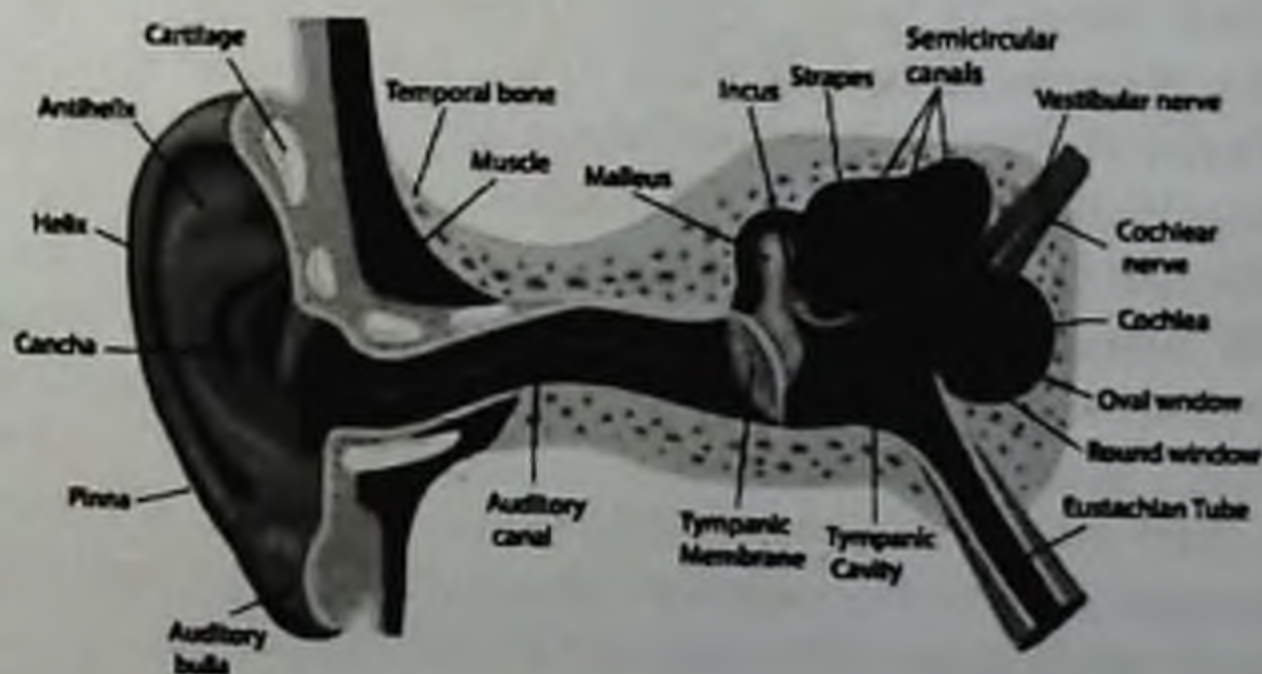


Figure - 2. Ear structure.

The stirrup when the handle is attached to the eardrum, the head is the connection in the anvil body forming a joint with the surface. Long and? What? and Oyo? hour long leg is connected to the head of the stirrup. The front of the stirrup and the hind legs are attached to the base or. Insert the stirrup base into the oval hole and attach the circumference with a lever. The interosseous joints are very strengthened by small ligaments, this "bone chain drum transmits the vibration of the curtain into the oval opening.

The average length of the ear canal (tuba auditiva) is 35 mm, the width is 2 mm. mm, ensuring the passage of air from the larynx into the drum cavity and ensuring that the pressure in the cavity remains the same as the external pressure. Its bone part enters the drum cavity, forming the upper 1/3 of the flute when opened, the lower part of the larynx forms 2/3 of the larynx opens into the nasal part. The mucous membrane of the spout with ciliated epithelium forms closed longitudinal folds.

The inner ear (Auris interna) is located inside the pyramid of the temporal bone, the bone and veil consist of a labyrinth. A bone labyrinth with a tympanic cavity, the internal auditory canal lies in the middle. It consists of corridor, shell and semi-ring flutes.

The irregular corridor (vestibule) is oval on the side wall of the space is an opening that is closed by the base of the stirrup. There are 5 holes for semi-circular tubes on the back wall of the corridor, and there is a hole in the front wall-shell. The edge of its medial wall is rounded and oblong distinguishes depressions.

The shell (snail) is the front of the bone labyrinth, the base of which is the inner one facing the auditory canal and the apex facing the drum cavity. Around its axis, there are two semicircular spiral channels with an incomplete barrier between them. The bone half-ring of the flute (canalis semicircularis ossei) is three: anterior (sagittal), posterior (frontal), lateral (horizontal). It opens three half-rings of the flute into an entrance hall with 5 holes, both the front and rear half-rings simple tubule legs join to form a common leg. Half one leg of annular tubes expands in the form of ampoule. the ampular one is called the foot, and the other is called the normal foot. The curtain maze (labyrinthus membranaceus) the bone settles inside the maze and returns its shape. Between them is a perilymphatic space called perilymphatic fluid. complete with... This space is mediated by the perilymph tube into the subarachnoid space is added. The curtain is filled with endolymph inside the labyrinth from which the liquid flows. it flows through the endolymphatic tube into the endolymphal sac.

In the veiled labyrinth in the corridor area there is a uterus and a bag, which are connected by a transverse flute. 5 veiled half-ring flutes in the uterus have holes that can be opened. The veil is half a ring of flute, the shape of a bone is half a ring, although it resembles flutes, three times

narrower. The uterus, sac and sensitive cells on the inner surface of the ampoule of the semicircular tubes are located. The curtain shell part of the labyrinth shell flute head from the corridor begins in a closed position and is directed into a spiral channel. A shell flute is placed in the middle of a spiral canal and ascends a drum ladder through a hallway staircase highlights. At the top of the projectile, two ladders cover the projectile and the hole is attached to the tool. Drum ladder based on projectile secondary drum ends in area of round hole draped with drapery. The staircase to the esa entrance hall joins the perilymphatic space of the corridor. A spiral (cortium) organ formed by a basilar plate on a spiral membrane inside the shell tube in it are cells that perceive perilymph fluctuations.

The perilymph, vibrating under the action of the movement of the base of the usanga attached to the dahlia window, passes from the dahlia ladder through the hole in the sink to the drum ladder and the secondary drum beats the curtain. The perilymph in the drum ladder vibrates to the basilar membrane and endolymph in the shell tube. Endolymph vibration connects to the auditory ligaments of the cortic organ and the cell receptor converts mechanical action into a nerve impulse. Pulse projectile peripheral ends of bipolar cells located in node are accepted. Its central processes, on the other hand, form part of the shell of the corridor-carapace nerve, it is located in the rhombic notch through the internal auditory canal, forming the ventral and dorsal nuclei of the shell. Ventral axon stem cells are directed in opposite directions to form a trapezoidal body. The axons of dorsal stem cells are located on the surface of the rhombic fossa of the IV ventricle into the trapezoidal body, forming the brain pathways are added. The trapezoidal fibers of the body bend outward, the lateral auditory centers under the cortex forming a loop: the medial knee body and heading towards the lower vertices of the four vertices. This is where the axons of the third neuron pass through the posterior leg of the inner capsule and end at the auditory center located in the upper jaw.

The newborn's ear sulfur is soft. His skin was thin. ear sulfur in the first year of the child's life and after 10 years grows rapidly in height compared to width. The external auditory canal of the newborn in children is narrow, long (15 mm) and obliquely located. The skin covering it is thin and thin. Length 22 mm at the age of 5 years. The eardrum is relatively large. The drum cavity in newborn children due to the thick submucosal layer is relatively small and sloping. Toi with fluid during childbirth, squeezing it through the ear canal into the larynx during the baby's breathing is sent. The auricle is straight, wide, short (17 mm), the bony is more developed. Its length is 30 mm in 2 years. 35 mm in 5 years, the width will be 1-2 mm at the age of 6 years. The size of auditory ossicles in a 4-month-old child as such does not change with age.

The inner ear is well developed in newborns, does not change with age.

Questions for self-training.

1. What parts make up the organ of auditory equilibrium?
2. Describe the structure of the outer ear?
3. What parts of the middle ear?
4. What are the walls of the drum cavity?
5. Describe the structure of the auditory bones.
6. Describe the structure of the ear canal.
7. What are the parts of the inner ear?
8. Describe parts of the bone labyrinth
9. Which parts make up the membranous labyrinth?
10. Describe the structure of the sink?
11. describe the auditory mechanism.
12. Describe the structures of the conductive hearing pathways.

Test questions

1. What parts make up the organ of hearing and balance?
 - A. Auricle, middle ear, inner ear
 - B. Outer, middle, inner ear
 - C. External, drum cavity, labyrinth
 - D. Drum cavity, bones, labyrinth
 - E. Auricle, tympanum, labyrinth
2. Eardrum size?
 - A. 9 x 11 mm
 - B. 10 x 9 mm
 - C. 10x8 mm
 - D. 9 x 10 mm
 - E. 10 x 11 mm
3. The bottom wall of the drum cavity?
 - A. paries tegmentalis
 - B. paries jugularis
 - C. paries labyrinthicus
 - D. paries caroticus
 - E. paries membranaceus
4. The back wall of the drum cavity?

- A. paries tegmentalis
 - B. paries membranaceus
 - C. paries jugularis
 - D. paries caroticus
 - E. paries mastoideus
5. Front wall of drum cavity?
- A. paries caroticus
 - B. paries mastoideus
 - C. paries membranaceus
 - D. paries jugularis
 - E. paries labyrinthicus
6. Top wall of drum cavity?
- A. paries membranaceus
 - B. paries mastoideus
 - C. paries labyrinthicus
 - D. paries jugularis
 - E. paries tegmentalis
7. The side wall of the drum cavity?
- A. paries tegmentalis
 - B. paries jugularis
 - C. paries mastoideus
 - D. paries caroticus
 - E. paries membranaceus
8. Medial wall of the drum cavity?
- A. paries membranaceus
 - B. paries mastoideus
 - C. paries labyrinthicus
 - D. paries jugularis
 - E. paries tegmentalis
9. What parts does the eardrum have?
- A. Pars superior, pars inferior
 - B. pars fibrosa, pars tensa
 - C. front part, rear part
 - D. pars lateralis, pars medialis
 - E. pars tensa, pars flaccida
10. What connects the drum cavity to the nose of the larynx?
- A. Middle ear
 - B. External ear canal
 - C. Eardrum
 - D. Eidge Pipe
 - E. Predverie
11. Which parts make up the bone labyrinth?
- A. vestibulum, cochlea, sacculus
 - B. vestibulum, cochlea, canalis semicirculares
 - C. utriculus, sacculus, cochlea

- D. canalis semicirculares, tubae auditiva
 - E. cochlea, tubae auditiva, sacculus
12. What are the half-rings in the maze?
- A. canalis semicirculares superior, posterior, lateralis
 - B. canalis semicirculares anterior, posterior, lateralis
 - C. canalis semicirculares inferior, posterior, lateralis
 - D. canalis semicirculares medius, posterior, lateralis
 - E. canalis semicirculares frontalis, posterior, lateralis
13. What is filled inside the membranous labyrinth?
- A. Cell
 - B. Perelymph
 - C. Endolymph
 - D. Fluid
 - E. Blood
14. What are the depressions in the bone maze?
- A. recessus ellipticus, cochlea
 - B. recessus sphericus, recessus ellipticus
 - C. recessus ellipticus, crista vestibuli
 - D. recessus sphericus, cochlea
 - E. recessus sphericus, canalis spiralis
15. Which tubes are inside the sink?
- A. scala vestibuli, scala tympani, sacculus
 - B. utriculus, scala tympani, sacculus
 - C. sacculus, scala tympani, ductus cochlearis
 - D. scala vestibuli, utriculus, ductus cochlearis
 - E. scala vestibuli, scala tympani, ductus cochlearis
16. Where are the cells of the first neuron of the auditory conductive pathway?
- A. In a helical assembly
 - B. In the sink node
 - C. In the sink
 - D. In pre-belief
 - E. In semi-ring tubes
17. Where are the cells of neuron II of the auditory conductive pathway?
- A. In the oblong brain
 - B. On the bridge
 - C. On the quatrain
 - D. On the internal knee body
 - E. In pre-belief
18. Where is the balance organ?
- A. In the drum cavity
 - B. In the inner ear
 - C. On the sink
 - D. In preversion and semi-circular pipes
 - E. Semi-annular tubules and in sink

Topic: Skin and its derivatives. Mammary gland. Sense of smell and organs of taste.

1. Purpose and task of training: Skin and its derivatives, milk independent study of the structure of the gland, organs of smell and touch.

2. In the process of studying the topic, the student should know:

1. Skin layers
2. Epidermal structure
3. dermis structure
4. Structure of subcutaneous fat layer
5. hair and nail structure
6. Structure of sebaceous and sweat glands
7. breast structure
8. olfactory organ structure
9. the structure of the body of taste cognition

3. In the process of studying the topic, the student must be able to show:

1. Skin and its derivatives
2. Scheme of the olfactory organ path
3. Organs of taste of the conducting path.

The skin (Cutis) not only protects the body from external influences, but it also acts as an important organ of feeling. The total level of human skin is 1.5-2 m² and directly depends on body size. Skin sensitivity in humans very well developed sensory receptors make the skin the same everywhere does not spread. There are too many sensory receptors on the lips, nose and fingertips. Differentiation of the epidermal surface layer and the deep dermis layer in the skin (Figure 3).

The epidermis (epidermis) is composed of ectoderma, multilayer consists of a flat epithelium. The outer layer of the epithelium turns into a stratum comeum., The move is renewed. Epidermis in the area of hips, shoulders, wrists, neck, face thin (0.02-0.05 mm), multiple blows in the area of palms of hands and legs for thick (0.5-2.4 mm).

Natural skin, dermis (dermis) developing from mesoderma, fibrous astringent consists of tissue. It has elastic fibers and smooth muscle tissue.. ensures skin elasticity. The thickness of the dermis in the wrist area is 1-1.5 if mm, then behind 2.5 mm. The dermis consists of two layers. Touching the

epidermis standing surface papillary layer (stratum papillare) soft astringent consists of tissue, forms suckers. They have blood, lymph, vessels and nerves. Papillae form edges on the surface of the epidermis, there are narrows between them. These saddles look good in the palm area of each person has their own personality. The reticular layer (tunica reticulare) consists of dense connective tissue containing collagen a lot of fiber. This layer passes directly into the subcutaneous fat layer. The subcutaneous fat layer on the body is of different thicknesses, fat on the eyelids and light skin will not be layer. Less in the forehead, nose, buttocks and heels are well developed in various areas. The color of the skin is the pigment contained in it depends on the amount. In some areas (color, around the papilla of the breast, around the labia and anus), the pigment is more concentrated.

HUMAN SKIN

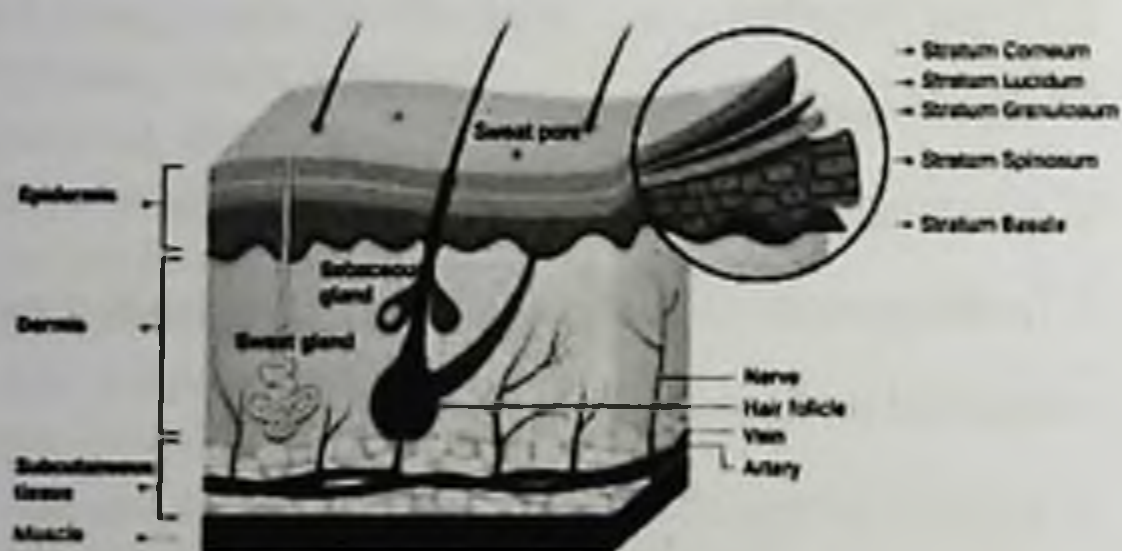


Figure -3. Human skin structure.

Hair (pili) skin differently becomes covered on different sites. They are epidermis the thin skin and a root are differentiated. Settling a root in skin, the growing expanded part of a hair forms a hair bulb. The root of a hair lies in a sack with connecting fabric. It in a bag output channels of sebaceous glands open. This bag elevator operator for hair a muscle is wrapped. He squeezes a sebaceous gland during reduction and styles hair. The hair color depends on the pigment which is contained in them. Air in hair the hair become gray if blisters appear and the pigment is lost.

Claws (unguis) arises because of roughness of epidermis. It scratches lies on the place (unguis matrix). It is that part of a nail which grows. In a nail bed the root, a body and a nail located in a nail crevice free edge which is outside are located varies. The root and side of a nail the skin folds bordered with claws are called claws.

Sweat, sebaceous and mammary glands belong to skin formations.

Sweat glands (*glandulae sudoriferae*) being normal tubular gland, sit lies on a deep floor. Their long output tube opens on the surface of skin in the form of an opening for sweat. Sweat glands aren't evenly distributed on skin. They are armpits? under, to an area cha, there is a lot of on palms of hands and legs, the head of a penis and a lip on chins won't be. Sweat glands excrete together with substance liquid, formed at various metabolism, and play an important role in thermal control.

Sebaceous glands (*glandulae sebaceae*) structurally idle time alveolar belongs to the category of glands, lies on border of a sosochkovy and mesh floor. Their nostrils open in a hair bag. Sebaceous glands on palms of hands and legs aren't present.

Mammary gland (*glandula mammaria*) being a pair member, he improves work of sweat glands. dairy products. A thorax in area III-VI of edges it is located on muscles. In a middle part of gland there is a sucker, on a tip - Dairy channels 10-15. The area around a pacifier is in limits of a pacifier and in a sucker there will be a lot of pigment. A body of a mammary gland of 15-20 pieces the connecting fabric and fatty tissue consisting of mutually soft fibrous a page divorce. They are called mammary glands. A rag cuts have complex alveolar ferruterous structure with radial location in relation to a sucker. Their output tube opens for the end of a sucker of a mammary gland. At newborns the mammary glands are less developed. She the girl during puberty becomes more and better. During pregnancy, ferruterous fabric grows and increases in sizes.

The organ of smell (olfactory body) in the top part of a nasal cavity on a mucous membrane of the top nasal sink and middle part of a nasal barrier consists of separate touch cages. Quantity of olfactory cages About 160 million from them are divided into the olfactory and supporting cages. olfactory cages are covered with numerous eyelashes which a surface which meets air and the general surface 5-7M2 is enough. The central cages of these cages form 15-20 olfactory nerves does. The olfactory nerve passes through a loopback plate of a tibial bone. gets inside and comes to an end in odorous onions. It is located in odorous onions II the neurons of Q form an olfactory way, forming an olfactory triangle the front loop opening comes to an end in a plate. From here the olfactory center, a crinkle passes the third neuron in paragippokampat and ункус.

The full body of knowledge, organum gustus, in suckers of language, the sky, a throat and a nadgortannik is located on mucous membranes about 2000 consists of bulbs. At elderly people many bulbs of full knowledge a part is put into a ring, in listovidny suckers, isn't numerous the full bulbs of knowledge located on fungoid suckers a mucous membrane opens on a surface a time. From them ledges full of informative cages come out. Full knowledge of language from the previous 2/3 person of fiber of an eardrum of a nerve, back 1/3 languages the sky and a mucous membrane of a throat depart from a

mucous membrane of a throat fibers of a lingual and pharyngeal nerve the wandering nervous fibers accept. Their central song - it comes to an end in touch kernels of nerves. These are stem cells of the second forms a neuron. Their axons partially intersect, partially don't intersect goes to ventral and medial kernels of visual bark. These kernels the third neuron which begins in cages a parahippocampus and a loop comes to an end in the center sense of smell located in a crinkle.

Questions for independent preparation.

1. Of what layers does skin consist?
2. What structure of epidermis?
3. What building terms?
4. Describe structure of hair and nails?
5. Describe the structure of sweat and sebaceous glands?
6. Describe the structure of a mammary gland?
7. Describe the structure of olfactory body?
8. Describe the building organs of taste?

Test questions

1. What are the layers of leather?
 - A. Epidermis
 - B. Epidermis sucker
 - C. Epidermis, dermis
 - D. Dermis, mesh layer
 - E. Derma papillary
2. What is the dermis developing from?
 - A. Ectoderma
 - B. Endoderma
 - C. Mesenhima
 - D. Mesoderma
 - E. Epithelium
3. What layers make up the dermis?
 - A. Pitelium papillary
 - B. Epidermis, mesh
 - C. Sedge and mesh
 - D. Single tissue, mesh
 - E. Sedimentary, epidermis
4. From what does the epidermis develop?
 - A. From ectoderm
 - B. From endoderm
 - C. Of mesenchyma
 - D. From the mesoderm
 - E. Iz epithelium
5. What does skin color depend on?
 - A. Epidermal volume

- B. Derma
 - C. To pigment
 - D. K to hair
 - E. Khera
6. What is included in skin derivatives?
- A. Hair, sweat glands, nails
 - B. Hair glands
 - C. Cutaneous, sebaceous and mammary glands
 - D. Sweat glands, omentum, nails
 - E. Glands, hair, nails
7. On which papillae of the tongue are the taste bulbs most located?
- A. Sheet-like, conical
 - B. Ring-shaped
 - C. Ring-shaped, leaf-shaped
 - D. Nitevid, conical
 - E. Riboidal, conical
8. Where are the bodies of sensitive nerve cells?
- A. in nodes
 - B. in the back corner
 - C. in the front corner
 - D. in the gray matter of the spinal cord
 - E. in the white matter of the spinal cord in the brain
9. Where are the thermoregulation centers?
- A. hypothalamus
 - B. in the cerebral cortex
 - C. longitudinal brain
 - D. Spinal Cord
 - E. in the midbrain
10. Give the name to the VIII pair of craniocerebral nerves?
- A. Middle door - snail nerve
 - B. Hazomotor nerve
 - C. Lingual nerve
 - D. Nerve nerve
 - E. Otodal nerve
11. Give the name to the VIII pair of craniocerebral nerves?
- A. N. vestibulocochlearis
 - B. N. glossopharyngeus
 - C. N. vagus
 - D. N. hypoglossus
 - E. N. abducens
12. What is the subcortical hearing center?
- A. Single knee body
 - B. Lateral knee body
 - C. Talamus
 - D. Pons

E. Upper mounds of the midbrain

13. In what sequence from the eardrum are the auditory bones placed?

A. Thread, anvil, stirrup

B. Nakovalnya, hammer, stirrup

C. Thread, stirrup, anvil

D. strain, anvil, hammer

E. Time, hammer, anvil

14. In which wall does the drum cavity extend into the mastoid cave?

A. Zadniy

B. Nizhniy

C. Upper

D. Medialnoy

E. Average

15. Do the vestibular nuclei lie?

A. in the vestibular field of the diamond-shaped fossa

B. In the lateral sections of the bridge

C. in caudal fossa

D. in cranial fossa

E. in the area of medial elevation

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“ARTEX NASHR”

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