

**ANATOMO-PHYSIOLOGICAL PECULIARITIES,  
METHODS OF EVALUATION AND SEMEIOLOGY OF THE  
SKIN, SUBCUTANEOUS TISSUE, BONES AND MUSCLES  
DISEASES IN CHILDREN**

**Academic discipline «Pediatric Propedeutics»**

***Self-study guide for the 3<sup>rd</sup> year***

***English medium students***

**АНАТОМО-ФІЗІОЛОГІЧНІ ОСОБЛИВОСТІ, МЕТОДИ  
ОБСТЕЖЕННЯ ТА СЕМІОТИКА ЗАХВОРЮВАНЬ  
ШКІРИ, ПІДШКІРНОЇ КЛІТКОВИНИ, КІСТКОВОЇ ТА  
М'ЯЗОВОЇ СИСТЕМ У ДІТЕЙ**

**З дисципліни «Пропедевтика педіатрії»**

***Методичні вказівки***

***до самостійної роботи студентів 3-го курсу***

***медичного факультету***

**МІНІСТЕРСТВО ОХОРОНИ ЗДОРОВ'Я УКРАЇНИ**  
**Харківський національний медичний університет**

**ANATOMO-PHYSIOLOGICAL PECULIARITIES,  
METHODS OF EVALUATION AND SEMEIOLOGY OF THE  
SKIN, SUBCUTANEOUS TISSUE, BONES AND MUSCLES  
DISEASES IN CHILDREN**

**Academic discipline «Pediatric Propedeutics»**  
***Self-study guide for the 3<sup>rd</sup> year***  
***English medium students***

**АНАТОМО-ФІЗІОЛОГІЧНІ ОСОБЛИВОСТІ, МЕТОДИ  
ОБСТЕЖЕННЯ ТА СЕМІОТИКА ЗАХВОРЮВАНЬ  
ШКІРИ, ПІДШКІРНОЇ КЛІТКОВИНИ, КІСТКОВОЇ ТА  
М'ЯЗОВОЇ СИСТЕМ У ДІТЕЙ**

**З дисципліни «Пропедевтика педіатрії»**  
***Методичні вказівки***  
***до самостійної роботи студентів 3-го курсу***  
***медичного факультету***

Затверджено  
Вченою радою ХНМУ  
Протокол № від

**Харків**  
**ХНМУ**  
**2016**

Anatomo-physiological peculiarities, methods of evaluation and semeiology of the skin, subcutaneous tissue, bones and muscles diseases in children: self-study guide for the 3<sup>rd</sup> year English medium students/ compiled by.: V.A., Klymenko T.V. Sirenko, K.O. Yanovska– Kharkiv: KhNMU, 2016. – 16 p.

Compiled by: Klymenko V.A.

Sirenko T.V.

Yanovska K.O.

Анатомо-фізіологічні особливості, методи обстеження та семіотика захворювань шкіри, підшкірної клітковини, кісткової та м'язової систем у дітей: метод. вказ. до самост. роботи студентів 3 курсу медичних факультетів / упор. В.А.Клименко, Т.В. Сіренко, К.О. Яновська. – Харків, ХНМУ, 2016. – 16 с.

Упорядники: Клименко В.А.

Сіренко Т.В.

Яновська К.О.

## Contents

A point to remember is that the various skin lesions are not isolated diseases of the skin alone. In the majority of cases such lesions are only manifestations of general metabolic disturbances (exudative diathesis) or of systemic diseases (various infections). And, conversely, diseases of the skin may affect the entire systems. Consequently, in any skin disease examination must not be restricted to the skin alone, but all the organs and systems must be examined.

The challenge of examining the skin lies in distinguishing normal from abnormal, significant findings from trivial ones, and in integrating pertinent signs and symptoms into an appropriate differential diagnosis. The fact that the largest organ in the body is visible is both an advantage and a disadvantage to those who examine it. It is advantageous because no special instrumentation, other than a magnifying glass, is necessary and because the skin can be biopsied with little morbidity.

Semiotics of bone system affections: the bone age deviation, the teeth age deviation, complains of pain, changes of bones, joints configuration, mobility disorders active, passive movements, morning joints inhibitions. Deformation of skull sizes, shape, skull bones, condition of sutures, fontanelles (microcephaly, macrocephaly, skull bones dysplasia), cephalogematoma, craniotabes, etc. The thorax-deformation, pigeon breast, cobbler's (or funnel) breast, «bead» symptom. Spinal column deformation, kyphosis, scoliosis, lordosis. Cylindrical bones, deformation, length changes. Flat planta, pigeon-toed. Osteoporosis signs inflammation affections of bones and joints. Changes of Ca and P blood and urine levels.

Semiotics of muscular system affections: muscle mass changes, sizes of some muscles, group of muscles (asymmetry). Change of muscle tone (increased, decreased). Change of muscles strength (increased decreased). Motive activity (normal, decreased, hyperkinesis, etc.). Active and passive movements (amount, generation, self-generation).

### **Specific goals**

- to be able to fulfil examinations of the skin and subcutaneous tissue, taking into consideration peculiarities in the methods of examination in children;
- to be able to fill in a case history for performing an objective examination of the osteomuscular system in children;
- to prescribe a complex of methods for laboratory and instrumental examinations of the osteomuscular system;
- to interpret the received data of examination with taking into consideration morphofunctional peculiarities of a child's organism;
- to make syndromic diagnosis in children with pathology of their skin, bone system and muscular system.

### **To know:**

- the morpho-functional peculiarities of skin and subcutaneous tissue in children;
- the embryogenesis of skin, anomalies of development;
- the methods of examinations, semiotics of skin diseases;
- characteristics of the basic pathology of the skin and subcutaneous tissue;
- the morpho-functional peculiarities of the muscular system in children;
- clinical and paraclinical methods of examinations of the muscular system,
- the main symptoms of the muscular system diseases (hypotrophy, atrophy, hypotony, hypertony, hyperkinesis, paralysis),
- the morpho-functional peculiarities of the osseous system of children;
- clinical and paraclinical methods of examinations of the osseous system,
- the main symptoms of the osseous system diseases

**Be able to:**

- to fulfil examinations of the skin and subcutaneous tissue, taking into consideration peculiarities in the methods of examination in children;
- to fill in a case history for performing an objective examination of the osteomuscular system in children;
- to prescribe a complex of methods for laboratory and instrumental examinations of the osteomuscular system;
- to interpret the received data of examination with taking into consideration morphofunctional peculiarities of a child's organism;
- to make syndromic diagnosis in children with pathology of their skin, bone system, and muscular system.

**Basic knowledge, abilities, and skills, which are necessary for studying the topic (interdisciplinary integration).**

The names of previous disciplines	Skills
1. General anatomy	To know the structure of the organs and systems of child's body. Clarifying the meaning of certain anatomical features of child's organism in the organizing of childcare.
2. Normal physiology	To know the features of functioning of the organs and systems of child's body in dependence of the age of the child.
3. Bases of psychology.	To analyze the emotions of the patient, interpersonal relationships, and children's behavior.

**Graphical structures of individual issues of the topic:**

1. Graphical structure of the topic «Methods of examination and the main symptoms of affection of the osseous and muscle systems in children» - Appendix 1.

2. Graphical structure of the topic «Methods of examination and the main symptoms of affection of the osseous muscle system in children» - Appendix 2.

3. Graphological structure to the topic «Anatomophysiological peculiarities of the skin in children» - Appendix 3.

### **The list of study materials:**

#### **Main:**

1. Propaedeutics of Pediatrics: Manual for foreign students / V. A. Fjoklin, V. A. Klymenko, O. M. Plakhotna, T. V. Sirenko, A. I. Kojemiaka, O. V. Sharikadze. – Kharkiv: 2010. – 356 p.
2. Kapitan T. Propaedeutics of children diseases and nursing of the child / T. Kapitan. – The state cartographical factory, 2006. – 734p.

#### **Additional:**

1. Nelson textbook of pediatrics.—19th ed./ [edited by] Robert M. Kliegman... [at. ol], p. SM
2. Ghai O.P. Essential pediatrics (fourth edition). – New Delhi, India: Interprint, 1996.—476 p.
3. Gupte S. The short textbook of pediatrics, 8<sup>th</sup> edition. – New Deli, India.: Iaypee Brthe others. Medical publishers (P) hTD, 1998. – 617 p.
4. Bickley L.S., Hockelman R.A. Physical examination and History Taking. – Philadelphia, New York, Baltimor.: Lippincott, 1999. – 789 p.

### **Test questions to the class:**

1. Describe peculiarities in the morphological structure of the child's skin.
2. What are the functions of the skin? What is the difference between the skin's functions in children and adults?
3. Describe the development of the subcutaneous adipose tissue during the antenatal and postnatal periods of childhood.

4. What is the difference between the chemical structure of child's and adult's subcutaneous adipose tissue? Explain the significance of this difference in child's pathology.
5. Describe peculiarities of the skin in different periods of childhood.
6. What do you know about peculiarities in the examination of the skin?
7. What pathological changes of skin color do you know? How can you interpret these changes?
8. How can you describe skin rashes? What do the words "primary" and "secondary" mean concerning morphological elements of rash? Give their descriptions.
9. Tell about palpation of the skin and subcutaneous tissue.
10. How can you check fragility of blood capillaries?
11. Describe the main paraclinical methods of examination of skin.
12. Tell about peculiarities of morphological structure of child osseous tissue.
13. What do you know about osseous system function?
14. Describe peculiarities of separate parts of skeleton – the head, spinal column, the pelvis girdle and extremities, the thorax.
15. What is the role of the osseous system examination in Pediatric practice? What methods of examinations of the osseous system do you know?
16. Describe the semeiology of the osseous system affections.
17. What do you know about morphological structure of the muscle system?
18. What is the dynamic of development of the muscle system?
19. What is the function of the muscle system?
20. State the main clinical and paraclinical methods of examinations of the muscle system.
21. What is the role of examinations of the muscle system in Pediatric practice?
22. Describe the semeiology of the muscle system affections.

### Tests for self-control:

1. On day 3 after the birth white or yellowish specks of 1.0x1.0 mm, reminding grains of millet are appeared on a nose of the child. How are these elements termed?
  - A. Nodule
  - B. Papule.
  - C. Vesicle
  - D. Milia
  - E. Miliaria
2. A child is suffering from atopic dermatitis. Some elements of the rash are marked on the skin by observation. Name the primary element of the rash.
  - A. An erosion
  - B. A cracks
  - C. An excoriation
  - D. A lichenificatio
  - E. A papula
3. A child suffers from chicken pox. Which of the above mentioned elements are considered secondary? Choose the more detailed answer.
  - A. An erosion, a vesicular
  - B. An erosion, a crusta, an excoriation
  - C. An excoriation, a papula, a macula, a vesicular,
  - D. A papula, a macula, a vesicular
  - E. A papula, an erosion, a crusta, an excoriation
4. A child was admitted to the intensive care department due to clinical sings of poisoning of mercury. It is known from anamnesis morbi that the child used “Unquentum Hydrargyri album” as antiseptic substance on the skin during 10 days. What morpho-functional peculiarities of the child’s skin promote to this pathological condition?
  - A. An incomplete formation of melanin on the basal layer of epidermis.

- B. An underdevelopment of the basal membrane between the epidermis and derma.
  - C. The thinning of stratum conium and an abundant vascularisation of the skin.
  - D. The poorly development of the fibroelastic connective tissue and muscular fibers in the derma
  - E. The prevalence of the cells elements in the derma.
5. What morpho-functional peculiarities of the child's skin promote to epidermolysis?
- A. An incomplete formation of melanin in the basal layer of epidermis.
  - B. An underdevelopment of the basal membrane between epidermis and derma.
  - C. The thinning of stratum corneum and an abundant vascularisation of the skin.
  - D. The poorly development of the fibroelastic connective tissue and muscular fibers in the derma
  - E. The prevalence of the cells elements in the derma.
6. The doctor examined the 5 years old child and revealed yellowing tinge of the skin by observation. The yellowing is particularly pronounced on the palms, soles and face, but the mucous membranes were rose without icterus and conjunctiva was white. The general condition of the child was satisfactory and he didn't have any complains. What is the probable reason of this changing of the skin's color?
- A. The hepatitis.
  - B. The defective development or absence of the biliary ducts.
  - C. The deposition of pigment carotene in the skin and adipose tissue caused by excessive consumption of carrots, tomatoes and tangerines. It's called carotene pigmentation.
  - D. Dyskynesia of gall-bladder due to the peculiarities of structure and an immaturity of vegetative nervous system's regulation.

E. The hemolytic syndrome caused by the destroying a lot of erythrocytes and increasing level of bilirubinum in the blood.

7. A child is examined on the first day of the life. He was born from II pregnancy with icteric coloring of the skin. His birth weight is 3400g. The group of blood of the mother is 0(I), Rh-(Rhesus factor is negative). The child's group of blood is 0(I), Rh-positive. The first pregnancy of mother has ended with a birth of the boy with weight 3200g. He is three years old now, he is healthy. What is the probable reason of yellowish colour of the skin?

- A. Physiological jaundice
- B. Incompatibility of blood of the mother and the child on the ABO system
- C. Incompatibility of blood of the mother and the child on the Rh-factor
- D. Hepatitis A
- E. Atresia of bilious tract

8. A child is examined on the twelfth day of the life. He was born from 1st pregnancy without any complications during pregnancy and delivery. It is known from anamnesis vitae that on the third day after birth the skin of newborn became yellowish. The jaundice disappeared on 10 day. What is the probable reason of yellowish color of the skin in this child?

- A. Physiological jaundice
- B. Incompatibility of blood of mother and a child on system ABO
- C. Incompatibility of blood of mother and a child on the Rh-factor
- D. Hepatitis A
- E. Atresia of bilious tract

9. A physician observed an infant. He paid attention to the cyanotic color of the skin. The cyanosis is particularly pronounced on extremities and around mouth. It increased when the child was eating or crying. What system's affection may be the reason of these pathological symptoms?

- A. The cardiovascular system.
  - B. The cardiovascular and gastrointestinal systems.
  - C. The gastrointestinal, skin and respiratory systems.
  - D. The skin, adipose tissue and respiratory systems.
  - E. The cardiovascular and respiratory systems.
- 10.** A doctor examined a premature baby in the newborn department. He determined the sclerema on the child's back (the indurations or diffuse hardening of the skin). What morpho-functional peculiarities of the child's adipose tissue promote (are favors for) the occurrence of sclerema?
- A. The abundant vascularization and immaturity of an immune system of the skin.
  - B. The thinning of epidermis of the skin.
  - C. The prevalence of solid fatty acid (palmitic acid) in the subcutaneous adipose tissue.
  - D. The prevalence of fluid fatty acid (oleic acid) in the subcutaneous adipose tissue.
  - E. The low melting point of the child's fat.
- 11.** A doctor examines a child. He checks the response reaction of the skin to mechanical irritation caused by tracing blunt instrument over it. The doctor fixes the type of reaction (red, white or mixed); the time interval between the irritation of the skin and appearance of the response and the time interval when line disappears. Name this method of investigation.
- A. A dermatoglyphica
  - B. A dermography
  - C. A patch test
  - D. A diascopy
  - E. A palpation
- 12.** A doctor examined a child. He revealed the located hardness in the derma and subcutaneous tissue unknown origin by palpation. It was painless. The skin was not changed under this formation. What paraclinical method of investigation can you propose to put the right diagnosis?

- A. A clinical analysis of blood
- B. A patch test
- C. A skin biopsy
- D. A bacteriological investigation from skin and mucous membranes
- E. A biochemical analysis of blood (a protein and its fractions, C-reactive protein, LE-cells, bilirubine)

**13.** A child was suffering from vesiculopustulosis – an infection of the skin, which is characterized for newborns and early infants. What paraclinical method of investigation gives opportunities to find reason of infection and its susceptibilities to antibiotics?

- A. A bacterioscopy from pustules
- B. A bacteriological investigation from nose, throat and umbilical wound
- C. A skin biopsy
- D. A bacteriological investigation from healthy skin and mucous membranes
- E. A bacteriological investigation from pustules

**14.** A doctor revealed some small red macula on the face of a child during observation. They were painless and didn't accompany by itching. But the doctor couldn't determine the origin of these elements (hemorrhagic or inflammation?) by observation. What method of investigation can you propose to establish the origin of these elements?

- A. A Wood's light
- B. A patch test
- C. A skin biopsy
- D. A dermatographiy
- E. A diascopy

**15.** A girl, 6 months old, is observed by a pediatrician about rachitis, undergoes a course of treatment with vitamin D. For the last 3 weeks she has developed worsening of appetite, irritability, inertness, frequent vomiting, loss of body weight, enlargement of the liver and spleen. The large fontanel is closed. Laboratory evidences:

hypercalcemia, hypophosphatemia, hypomagnesemia, azotemia, Sulkovich's test is dramatically positive. What diagnosis can be established in this case?

- A. Thyroid gland insufficiency syndrome
- B. Parathyroid gland insufficiency syndrome
- C. Pyelonephritis
- D. Hypervitaminosis D
- E. Pylorostenosis

**16.** An infant, 10 months old. In crying or fear develops laryngospasm: hoarse inhalation, respiratory standstill for several seconds; skin pallor which develops into cyanosis, carpopedal spasm. Laboratory evidences: reduction in calcium level in the blood serum. What pathology is it necessary to think about first of all?

- A. Hypervitaminosis D
- B. Encephalitic syndrome
- C. Rachitis, spasmophilia
- D. Meningeal syndrome
- E. Epileptic seizure

**17.** A boy aged 10. Complains of a pain in the muscles of the limbs which grows worse during movements; painful carnification of the muscles. Elevation of the temperature is not observed. What pathology is it necessary to think about first of all?

- A. Structural lesion of the central nervous system
- B. Reduction in muscular tone
- C. Meningitis
- D. Hypermyotonia
- E. Myositis

**18.** A 9-year-old girl's mother came to consult a doctor complaining of involuntary movements of the limbs, increased inertness, and inexact handwriting. In the past history of the child: frequent quinsies; additional examination of the nasopharyngeal mucus revealed  $\beta$ -hemolytic streptococcus. What pathology can be supposed in this case?

- A. Cerebral paralysis

- B. Rachitis
  - C. Rheumatic lesion of the nervous system (chorea)
  - D. Poliomyelitis
  - E. Hyperkinesia as a consequence of the thyroid gland lesion
- 19.** A 6-months child's mother consulting a doctor has expressed her anxiety in connection with the open large fontanel. At what age should the large fontanel close in full-term infants?
- A. 2 mths
  - B. 3-4 mths
  - C. 5-6 mths
  - D. 1-1,5 year
  - E. 2 years
- 20.** A pediatrician is examining a 7 months –old child. The child is healthy, can sit unassistedly. What physiological spinal curvatures can emerge at this age?
- A. Cervical lordosis, pectoral kyphosis
  - B. Pectoral kyphosis, lumbar lordosis
  - C. Coccygeal kyphosis
  - D. Lumbar lordosis
  - E. Only cervical lordosis

**Assignment for individual student work:**

To make a conversation with parents of children with breastfeeding and after introduction of solid foods.

**The standards of answers to the tests:**

1-D; 2- E ; 3- B; 4- C; 5- B; 6- C ; 7- C; 8- A; 9- E ; 10- C; 11- B; 12- C; 13- E; 14- E; 15- D; 16- C; 17- E; 18- C; 19- D; 20- A.

The maximum number of points which may be consequently obtained by students is 200 points; this includes 120 points for current educational activity and 80 points for the final lesson.

Current educational activity of students is controlled during practical classes according to specific goals in the course of each

practical class as well as during self-training in the hospital department. It is recommended to apply the following means of diagnostics of the students' level of readiness: control of practical skills, solving cases and test control of theoretical knowledge.

The current assessment of students on respective topics is conducted in the traditional 4-point grade scale ("excellent", "good", "satisfactory" and "unsatisfactory") with further conversion into a multiscore scale.

**The grade "Excellent"** is given when the student knows the program in toto, illustrating the answers with various examples; gives clear and comprehensive answers without any hints; delivers the material without any inaccuracies or errors; performs practical tasks of a different degree of complexity.

**The grade "Good"** is given when the student knows the whole program and understands it well, gives correct, consistent and structured but not completely comprehensive answers to questions, although he is able to answer additional questions without mistakes; solves all cases and performs practical tasks experiencing difficulties only in the most complex situations.

**The grade "Satisfactory"** is given to the student based on his satisfactory level of knowledge and understanding of the entire subject. The student is able to solve modified tasks with the help of hints; solves cases and applies practical skills experiencing difficulties in simple cases; is unable to deliver a consistent answer, but answers direct questions correctly.

**The mark "Unsatisfactory"** is given when the student's knowledge and skills do not meet the requirements of the grade "satisfactory".

Given the number of practical classes the grades are converted into the multiscore scale as follows:

**The mark "Excellent" – 72-80 scores**

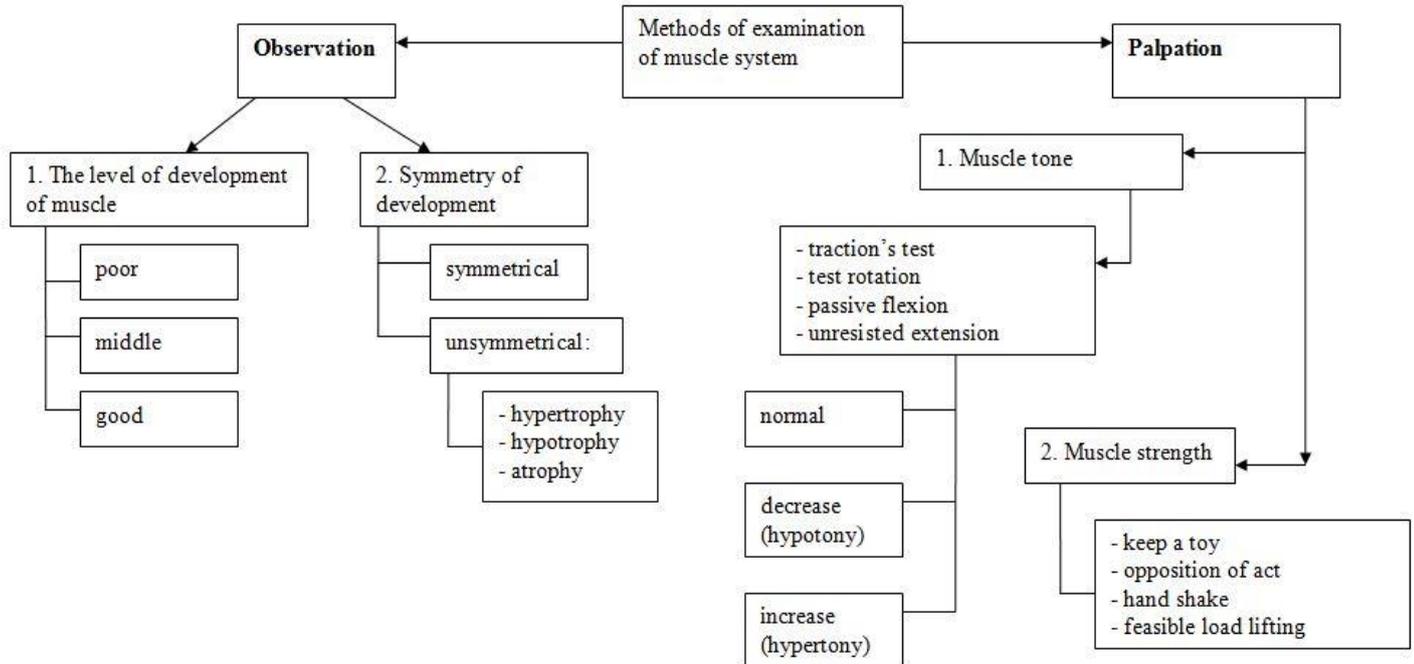
**The mark "Good" – 60-71 scores**

**The mark "Satisfactory" – 50-59 scores**

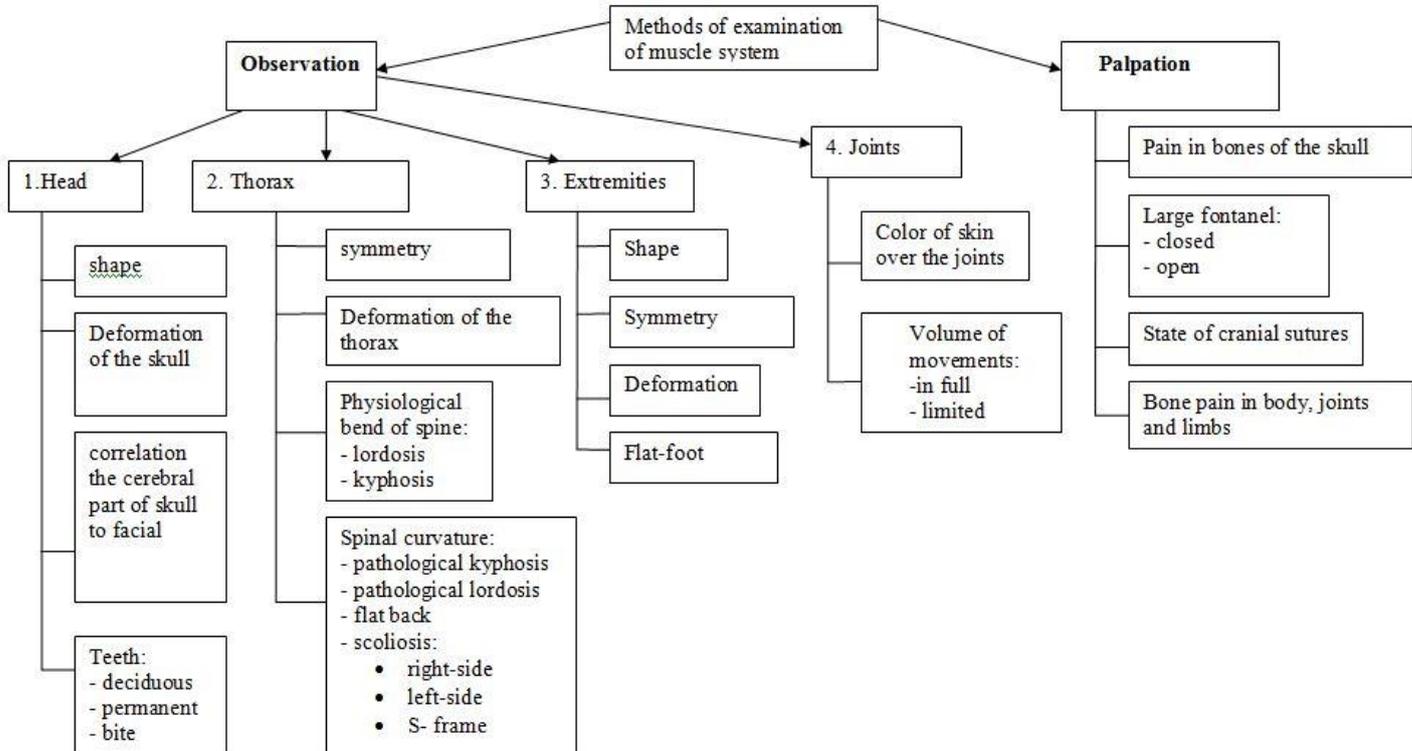
**The mark "Unsatisfactory" – 0 scores**

# Graphological structure of the theme «Methods of examination and the main symptoms of affection of the osseous and muscle systems in children»

## Appendix 1

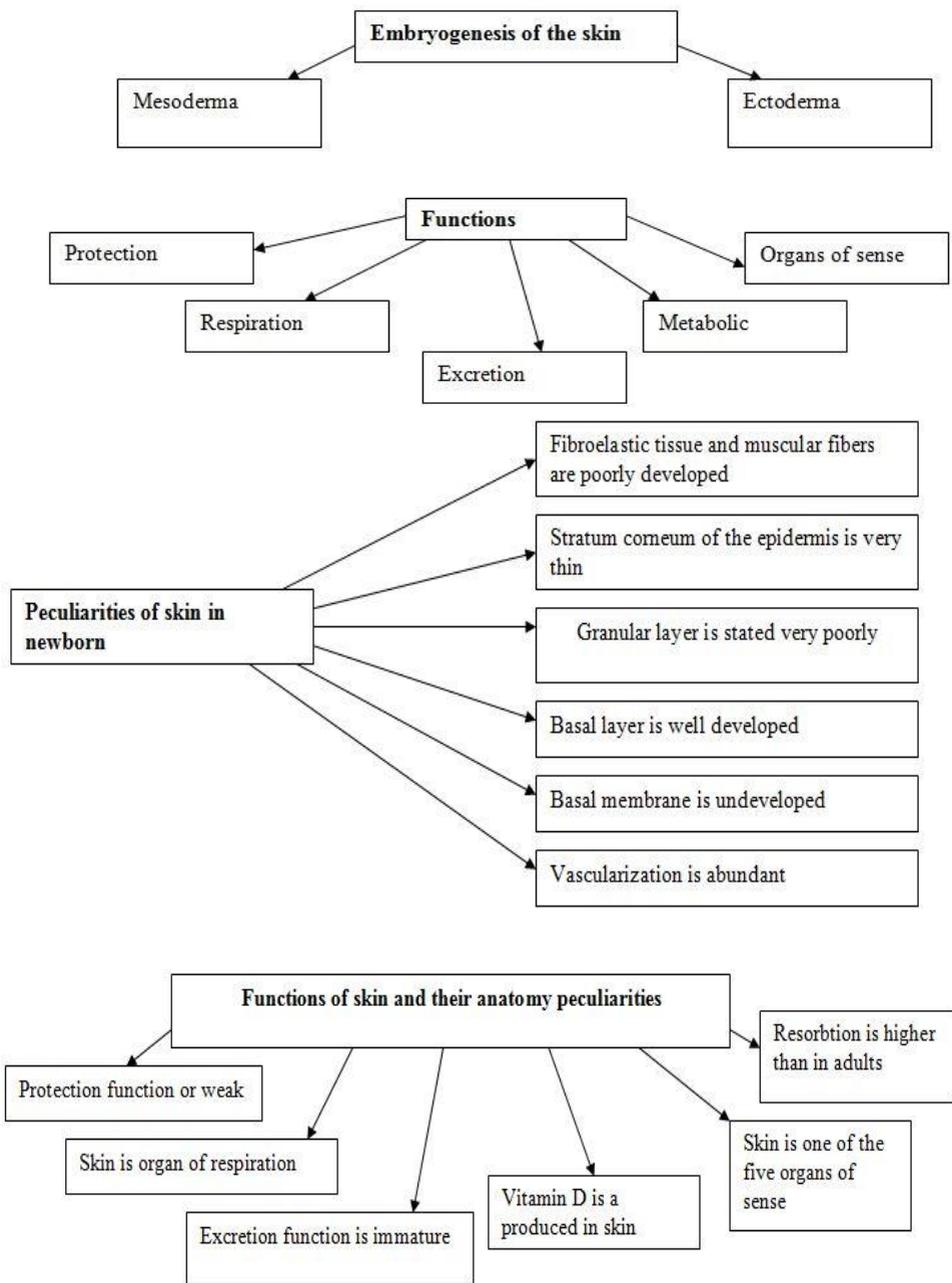


# Graphological structure of the theme «Methods of examination and the main symptoms of affection of the osseous and muscle systems in children»

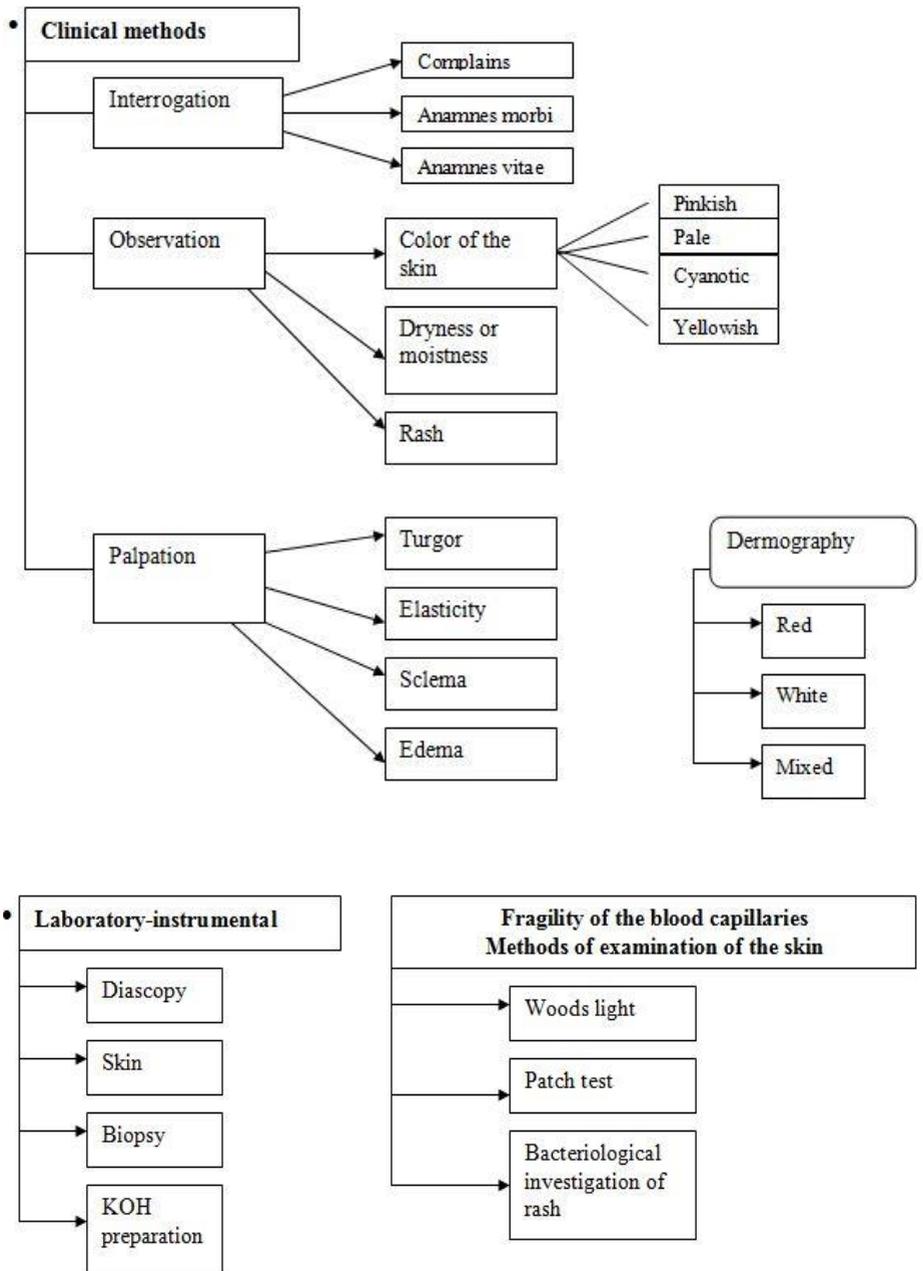


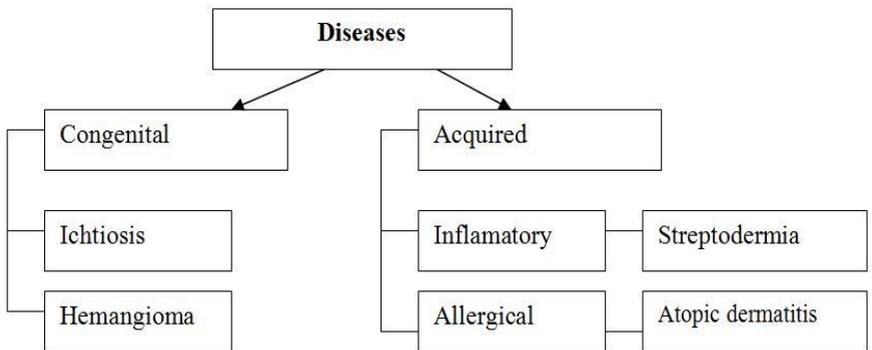
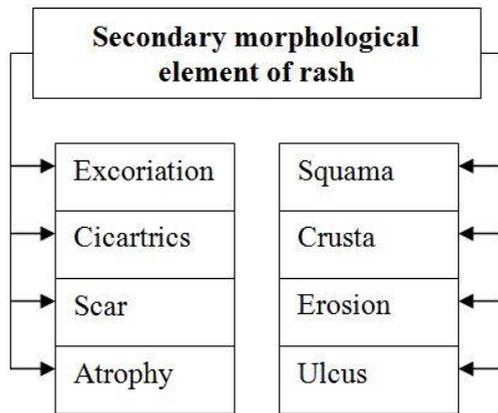
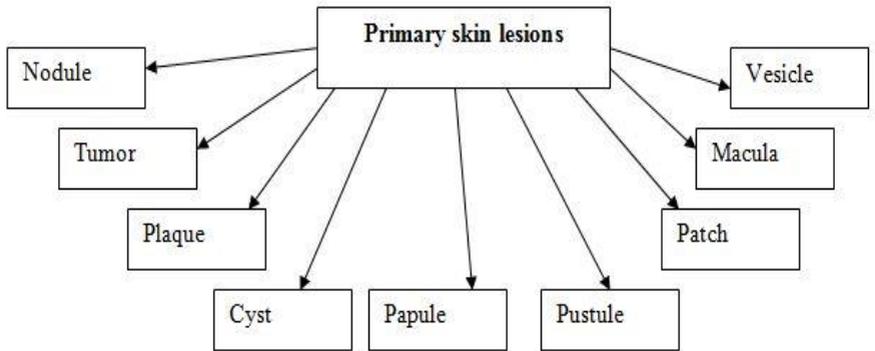
**Graphological structure to the topic:  
«Anatomophysiological peculiarities  
of the skin in children»**

**Appendix 3**



## Methods of examination of the skin





**Для нотатків**

**Для нотатків**

## *Навчальне видання*

**Анатомо-фізіологічні особливості, методи обстеження та семіотика захворювань шкіри, підшкірної клітковини, кісткової та м'язової систем у дітей**

Упорядники: Клименко Вікторія Анатоліївна  
Сіренко Тетяна Вадимівна  
Яновська Катерина Олександрівна

Відповідальний за випуск: Клименко В.А.

Комп'ютерна верстка

Ум. друк. арк. \_\_\_\_ . Тираж \_\_\_\_ прим. Зам. № \_\_\_\_ .

---