Ministry of Public Health of Ukraine
National O.O. Bohomolets Medical University

METHODICAL GUIDE
to practical classes for students

Educational discipline	Propaedeutics of Pediatrics including nursing practice, basic medical skills in the pediatric department
Training direction	22 " Public Health ", II (master's) educational and qualification level
Specialty	222 «Medicine»
Department	Paediatrics # 2
Thematic module 2	Anatomical and physiological features of organs and systems in children, clinical examination methods. Semiotics of damage syndromes of each of the systems and the most common diseases.
Topic:	Anatomical and physiological features, methods of examination of the musculoskeletal system in children. Semiotics of diseases of the musculoskeletal system in children.
Course	3

Approved on methodic meeting of department of pediatrics №2 from «28» august 2023., protocol №1

Considered and approved: CMC on pediatric disciplines from «28» august 2023., protocol №1

1. Goal: the student acquires knowledge about:
• the main anatomical and physiological features of the musculoskeletal system in children, methods of clinical research in children, symptoms and syndromes of damage to the musculoskeletal system;
the student's acquisition of skills regarding:
• taking an anamnesis from a child (and/or his mother/caregiver) with diseases of the musculoskeletal system;
• examination of the musculoskeletal system in children, taking into account the age of the child, determination of pathological symptoms and syndromes;
• interpretation of the data of the objective examination of the child's musculoskeletal system, taking into account age characteristics;
• appointment of additional instrumental and laboratory methods of examination to assess the state of the child's musculoskeletal system;
• analysis of the main symptoms and syndromes of damage to the musculoskeletal system of the child, taking into account age characteristics.

2. Competencies:
• collecting complaints, medical history and life of a child (and/or his mother/caregiver) with diseases of the musculoskeletal system;
• clinical examination of children with diseases of the musculoskeletal system;
• interpretation of the received data of the clinical examination of children with diseases of the musculoskeletal system;
• determination of clinical syndromes and symptoms in children with diseases of the musculoskeletal system.

3. **Plan and organizational structure of the lesson**

The name of the stage	**Description of the stage**	**Mastery levels***
Preparatory stage	Organizational measures Setting educational goals, student motivation	*
The main stage	Test control on the subject of the lesson, checking and announcing the results. - theoretical survey; - demonstration of practical skills, clarification of the most important points regarding the clinical examination of children with pathology of the musculoskeletal system (palpation of bones and muscles, palpation of the knee joint,	** *, **, ***

*		determination of signs of flat feet, rickets, scoliosis); - students' work on acquiring the skills of clinical examination of children with pathology of the musculoskeletal system; - acquisition by students of the ability to assess changes in the state of the musculoskeletal system in various diseases in children. Solving problems according to the subject of the lesson.	**, ***
	Final	Analysis and assessment of student work results. Announcement of the topic of the next lesson, an indicative map for independent work with literature.	*
		Together 2,5 academic hours	

Introductory, **reproducible, *** reconstructive, **** creative learning levels.

4. Content of educational material

4.1. A list of the main terms, parameters, and characteristics that the student should learn when preparing for the class:

Term	Definition
Microcephaly	Reducing the size of the head. Observed in congenital cerebral hypoplasia, after meningoencephalitis, Little's disease
Macrocephaly	An increase in the size of the head. It is observed in patients with hydrocephalus, with rickets (slight increase).
Dolichocephalic skull	Narrow (depending on the ratio of transverse and longitudinal diameters of the skull)
Mesocephalic skull	Average
Brachycephalic skull	Wide
Tower-shaped skull	Sharply elongated head, high forehead that rises steeply, vertically placed parietal bones, closed sagittal suture
Gluteal skull	The frontal and parietal humps are significantly enlarged, the skull is flattened, the sagittal suture is sunken
Saddle-shaped skull	The frontal and parietal humps are significantly enlarged, the sutures (sagittal and coronal) are significantly deepened, a

	particularly pronounced depression in the place of the large parietal lobe
Scaphocephaly	Premature closure of the sagittal suture; characterized by an elongated or narrow shape of the head
Oxycephalus	Premature closure of the coronal and another suture; characterized by pronounced deformation of the skull, face and eye sockets
Micrognathia	Underdeveloped lower jaw due to underdevelopment of the bones of the facial skull and damage to the temporomandibular joint
Макрогнатія	An increase in the size of the lower jaw
Conical chest	The anterior-posterior and transverse dimensions of the chest are the same, the epigastric angle is obtuse, the ribs depart from the spine at a right angle, almost in a horizontal direction
Cylindrical chest	The anterior-posterior and transverse dimensions of the chest are almost the same, the epigastric angle is straight, the ribs are directed obliquely, from top to bottom
Flat chest	The chest is flattened due to the reduction of the anterior-posterior size, the epigastric angle is sharp, the direction of the ribs is oblique and they are attached to the spine at an acute angle
Rachitic chest	The chest is flattened on both sides, the lower aperture is wide open, the formation of a noticeable deep furrow in the form of a transverse recess (Harison's furrow) at the place of attachment of the diaphragm, thickening at the transition of the bony part of the ribs into the cartilage ("rachitic chaplets").
Keel-shaped chest	An increase in the anterior-posterior size of the chest, the sternum protrudes forward
Funnel-shaped chest	The sternum sinks deep to the spine
Tubular chest	Expansion of the entire chest, increase in its anterior-posterior and transverse dimensions
Paralytic chest	The chest is flattened, all its dimensions are reduced, the ribs protrude, the spaces between them are wide and deep, the respiratory muscles are atrophic
"Heart Hump"	Limited protrusion of the chest in the area of the heart
Lordosis	Cervical and lumbar curves are directed forward
Kyphosis	Thoracic and sacral curves are directed backwards
Scoliosis	Spinal curvature (left-, right- or S-shaped)

Normal back shape	Moderate physiological curves
Flat back shape	Physiological curves are absent or weakly expressed
Flat-curved shape of the back	Thoracic kyphosis is absent, lumbar lordosis is well expressed
Round shape of the back	Thoracic kyphosis is significantly pronounced, and cervical and lumbar lordosis are smoothed
Round-concave shape of the back	It is characterized by an excessive increase in the physiological curves of the spine: cervical and lumbar lordosis, thoracic and sacral kyphosis.
Rickets kyphosis	Uniform arcuate curvature of the thoracic and lumbar spine, turned back by the convexity
Spina bifida	Congenital splitting and defect of the vertebral arches with the formation of a hernia of the meninges and the spinal cord itself. With acromegaly, the growth of the lower and upper limbs increases; the head, tongue, facial features become coarser.
Arachnodactyly	A pathological condition in which the fingers become thin and long compared to the palms.
Acromegaly	The disease, which manifests itself in the excessive growth of bones, soft tissues and internal organs, is observed after the closure of the growth zones.
Amelia	Congenital absence of limbs
Hemimeligia	Absence of one limb or part of it
Phocomelia	A significant decrease in the size of the proximal parts of the limbs
Acheyria	Absence of wrists
Adactyly	Absence of fingers
Aphalangia	Absence of phalanges
"Drum Sticks"	Deformation of the terminal phalanges
Polydactyly	Additional fingers
Syndactyly	Fusion of fingers
Macrodactyly	Enlargement of one or more fingers

"O"-shaped legs	Distortion by convexity outwards
"X"-shaped legs	Curvature by convexity inwards
Coxavara	Congenital varus deformity of the hips
Genu valgum	Medial curvature of the knee joint
Monoarthritis	One joint is affected
Oligoarthritis	2-3 joints are affected
Polyarthritis	Many joints are affected
Joint swelling	Diffuse edema in the area of the joint, a uniform increase in size and smoothing of its contours due to inflammatory swelling of the surrounding tissues and exudation into the joint cavity
Defiguration of the joint	Uneven change in the shape of the joint, irregular shape due to exudative and proliferative processes in the joint and effusion in the joint bag
Deformation of the joint	A change in the shape of the joint as a result of destruction or deformation of the articular surface, subluxation and ankylosis
Craniotabes	Softening of the bones of the skull
"Rachitic bracelets"	Thickening of the epiphyses of the radial bones of the forearm
"Strings of Pearls"	Thickening of the diaphyses of the flanks of the fingers
"Duck Walk"	Limping when walking (shortened lower limb, asymmetry of skin folds on the thighs, additional skin folds on the medial surface of one of the thighs, lordosis of the lumbar region, external rotation of the lower limb)
Muscle atrophy	The extreme degree of weak development and underdevelopment or degeneration of individual muscles or their groups
Muscle hypertrophy	Thickening and increase in muscle mass due to hypertrophy of muscle fibers
Paralysis	Loss of the ability to perform voluntary movements
Paresis	Partial loss of the ability to perform voluntary movements
Monoplegia	Paralysis of the muscles of one limb
Hemiplegia	Paralysis of the muscles of the upper and lower limbs on one side

Paraplegia	Paralysis of the muscles of the arms (upper paraplegia) or legs (lower paraplegia)
Tetraplegia	Paralysis of muscles of both upper and lower limbs
Muscle atony	Lack of muscle tone
Muscle hypotonia	Decreased muscle tone
Hypertension of muscles	Increase in muscle tone
Muscle dystonia	Variable muscle tone

5. Theoretical questions that are considered in class.

1. Name the anatomical and physiological features of the bone system of children of different ages.
2. List the fontanelles on the child's skull and indicate the timing of their closure.
3. Specify the period and order of appearance of milk teeth.
4. Name the physiological curves of the spine and the terms of their formation.
5. Name the pathological types of posture.
6. Specify the main stages of the clinical examination of the bone tissue of the child's skull.
7. Describe the types of deformation and changes in the size of the skull (caput quadratum, "Olympic forehead", buttock-shaped skull, flat occiput, craniotabes, saddle-shaped deformation of the head, tower skull, asymmetric deformation of the skull, macrocephaly, microcephaly). In what diseases are the specified types of deformation and changes in the size of the skull observed?
8. Specify the main stages of a clinical examination of a child's chest.
9. Define the cylindrical shape of the chest.
10. Describe the types of deformation of the chest (chicken (keel-shaped), cobbler (funnel-shaped). In which diseases are these types of chest deformation observed?
11. Define Harrison's furrow.
12. Define the pathological changes in the limbs in rickets ("bracelets" and "pearl necklace").
13. Describe the O-shaped and X-shaped legs.
14. List the clinical methods of diagnosis of congenital dislocation of the hip joint.
15. The method of determining the symptoms of Marx-Ortolani, Barlow, Trendelenburg, their interpretation.
16. Define "duck walk" and name the diseases in which it is observed.

17. Name the anatomical and physiological features of the muscular system of children of different ages.
18. List the criteria for assessing the state of the muscular system.
19. Specify the indicators of the degree of development of muscle mass in children.
20. Methods of examining muscle strength in children of different ages.
21. What is muscle tone? List the methods of assessing muscle tone in children of different ages.
22. Specify the methods of assessing the child's coordination of movements.
23. What is muscle atrophy and in what diseases is it observed?
24. Specify options for muscle tone disorders. In which diseases are muscle tone disorders observed?
25. Define central and peripheral paralysis and paresis.
26. Define hemiplegia, tetraplegia, paraplegia. In what diseases are they observed?
27. What is joint deformity?
28. Define joint deformation. In which diseases are deformations of the joints observed?
29. Define mono-oligo- and polyarthritis. In what diseases do they occur?

Recommended literature.

Basic:

Nelson textbook 21th Edition by Robert M. Kliegman, MD, Joseph St. Geme, Nathan J. Blum, Samair S. Shan, Robert C. Tasker, Karen M. Wilson, Richard E. Behrman Видавництво: Elsevier, 2019. P. 6399-6409.

Additional:

1. Fundamentals of pediatrics according to Nelson. Karen J. Marcdante, Robert M. Kligman; translation of the 8th Eng. edition in 2 volumes. Scientific editors of the translation V.S. Berezenko, T.V. Rest Kyiv: VSV "Medicine", 2020.

2. Katilov O.V., Dmitriev D.V., Dmitrieva K.Yu., Makarov S.Yu. Clinical examination of a child. 2nd edition. Vinnytsia: Nova Kniga, 2019. 520 p.

3. Pediatrics: textbook. T.O. Kryuchko, O.Y. Abaturov, T.V. Kushnereva et al.ed. by T.O. Kryuchko, O.Y. Abaturov. Kyiv : AUS Medicine Publishing, 2016. 208 p. (p.39-49) ISBN 978-617-505-485-7.