

NATIONAL MEDICAL UNIVERSITY
named after O.O. BOGOMOLTS

METHODOLOGICAL RECOMMENDATIONS
to practical classes for students

Academic discipline " Propaedeutics of pediatrics including nursing practice, basic medical skills in the pediatric department "

Educational level second (master's)
Discipline 22 "Oh the glory of health "
Specialty 222 "M edicine "
Educational program of the OPP "Medicine"

Department of Pediatrics No. 2

Topic " Physical development of children, evaluation of anthropometric results. Semiotics of disorders of physical development of children "

Approved at the meeting of the Department of Pediatrics No. 2 on " 27 " August 2026, protocol No. 1

Considered and approved: CMC on pediatric disciplines dated August 28, 2026 , protocol No. 1

Revised and re-approved: No. ____ of _____ 20__

No. ____ of _____ 20__

No. ____ of _____ 20__

1. **Goal:** formation of professional competencies to achieve program learning outcomes in the physical development of children , assessment of anthropometric results and semiotics of disorders of physical development of children, namely:

student's acquisition of knowledge about:

- patterns of changes in anthropometric parameters by child's age;
- basic methods for assessing the physical development of children of different ages;
- factors affecting the physical development of children;

student's acquisition of skills and abilities:

- conducting anthropometry: measuring body weight and height, head circumference and chest circumference of a child of different ages;
- assessment of anthropometric indicators of children of different age groups;
- collection of anamnestic data to analyze factors that could have influenced the physical development of children (in case of deviations of the child's physical development indicators from the normative ones).

2. Competencies:

1. Assessment of physical development of children of different ages.
2. Providing recommendations to parents of children with physical developmental disabilities.

Equipment: devices for conducting anthropometry, graphs and tables for assessing indicators of physical development of children of different ages (Order of the Ministry of Health of Ukraine No. 1590 of September 13, 2024), textbook, computer.

3. Lesson plan and organizational structure

Stage name	Stage description	Levels of absorption*
Preparatory stage	Organizational events Setting learning goals, motivating students	*

*
Familiarization,
**reproduction,

reconstructive,
**** creative
levels of
assimilation.

Main stage	Test control on the topic of the lesson, verification and announcement of results. Theoretical survey; - clarification of the most important points regarding the characteristics of the growth and development processes of children; - clarification of the most important points regarding application of various methods for evaluating anthropometric results. work on acquiring skills in assessing the physical development of children of different ages; - students acquire the skills to provide recommendations to parents of children with physical developmental disorders. Solving problems on the topic of the lesson	** *, **, *** ****
Summary	Analysis and evaluation of student work results. Announcement of the topic of the next lesson, an indicative map for independent work with literature.	*
Total 2.5 academic hours		

4. Content of the training material

List of basic terms and parameters and characteristics that the student must learn

Term	Definition
Physical development	FR is a set of morphological and functional features of an organism that characterize the processes of its growth and biological maturation, the reserve of physical strength.
Characteristics of growth and development of children	● Growth is a reflection of the systemic development of the organism. Skeletal growth retardation, to a certain extent, leads to a slowdown in the growth and differentiation of the brain, skeletal muscles, myocardium, and other internal organs. ● With age, the growth rate decreases. ● The growth rate is characterized by unevenness, with periods of elongation (growth spurts) alternating with periods of rounding. ● Growth is accompanied by a change in body proportions. ● Craniocaudal growth gradient - distal body segments grow at a faster rate than proximal ones. ● Children's growth rates are gender-dependent.

Anthropometry	A unified methodology for measuring the human body as a whole and its individual parts.
Basic anthropometric indicators	body weight, body length (height), head circumference, chest circumference
Methods for evaluating anthropometric results	approximate calculations; signal / standard deviations (SD); centile standards.
Body mass index (BMI)	The body mass index depends on the height of the child (person), therefore it is customary to estimate body weight by height (for children under 2 years old) or by BMI (kg/m ²). 
Semiotics of FR violations: body length, body weight, head size	Growth retardation (m and n degrees - dwarfism), tallness (max degree - gigantism); Overweight, obesity. Underweight and severe underweight. Microcephaly, macrocephaly.

Height/length assessment of children under 18 years of age

(by order of the Ministry of Health of Ukraine No. 1590 dated September 13, 2024)

Estimation of height (d.t.) by the method of signal / standard deviations (SD)		
<i>SV intervals</i>	<i>Height estimate (d.t.)</i>	<i>Doctor's tactics</i>
$\geq 2 \text{ SV}$	Tall	Finding the causes of growth retardation, consulting with specialists, treatment
from 1.1 SV to 2 SV	Variant of the norm (height above average)	Requires careful observation, assessment of growth rate
$M \pm 1 \text{ SV}$	Norm (average height)	
from - 1.1 SV - 2 SV	Variant of the norm (below average height)	Requires careful observation, assessment of growth rate
$\leq 2 \text{ SV}$	Short stature	Finding the causes of growth retardation, consulting with specialists, treatment

In order to express the actual height indicator (FR, cm) of a child in SD, it is necessary to: compare it with the median (M) for a given age and gender of the child and divide by the SD value (FR – M : SD).

Example: the actual height of an 11-year-old girl is 160 cm, the median is 145.5 cm, and the SD value is 6.7 cm. Calculation: $160 - 145.5 = 14.5 \text{ cm}$, divide by 6.7 = 2.16 SD. Conclusion: the girl's height is higher than 2 SD, therefore she is tall.

In order not to make the specified calculations in the tables (Table 1) by column numbers from No. 5 to No. 11, the values of the SV limits are indicated (-3 SV, -2 SV, -1 SV, M, 1 SV, 2 SV, 3 SV). Therefore, you only need to find out in which SV interval the actual height indicator is located. Regarding our example: the actual height of 160 cm exceeds the value of 2 SV (158.9 cm).

Table 1. Estimation of height (body length) of girls (SV)

Age		Height								
1	2	3	4	5	6	7	8	9	10	11
Miss Years		Median	SV	-3SV	-2SV	-1ST	M	1ST	2SV	3SV
11	0	145.5	6.7	125.5	132.2	138.9	145.5	152.2	158.9	165.5

Body weight assessment of children under 18 years of age

(by order of the Ministry of Health of Ukraine No. 1590 dated September 13, 2024)

Weight estimation (b.w.) using the centile standards method by indicators: - ratio of body weight (kg) to height (cm) - in children under 2 years of age; - BMI (kg / m^2) – from 2 to 18 years		
<i>Percentile interview</i>	<i>Weight estimate (m.t.)</i>	<i>Doctor's tactics</i>
≥ 97 cents.	Adiposity	Finding the causes, consulting with specialized specialists
≥ 85 cents. < 97 cents.	Excess m.t.	Nutrition and physical activity tips
> 15 cents. < 85 cents.	Normal weight (lbs.)	
< 15 cents. > 3 cents.	Deficit of m.t.	Thorough examination, nutritional assessment
≤ 3 cents.	Severe deficiency of m.t.	Finding the causes, consulting with specialized specialists

5. Theoretical issues covered in the class.

1. Definition of the concept of FR, its components.
2. Characteristics of children's growth and development.
3. Indicators of physical development of a newborn child, physiological loss of body weight (causes, average values, recovery period).
4. The law of proportional increase in height and weight, the circumference of the chest and head in different angles and diameters .
5. Factors influencing the indicators of children 's physical development .
6. Methodology for evaluating anthropometric results using approximate calculations
7. Methodology for evaluating anthropometric results using the centile standards method .
8. Methodology for evaluating anthropometric results using the standard deviation method.

9. Semen and otics of body length and weight disorders, their causes.
10. Semiotics of head and chest circumference disorders, their causes.

Recommended reading.

Main:

1. Clinical examination of a child: a textbook for students of higher educational institutions / O.V. Katilov, D.V. Dmitriev, K.Yu. Dmitrieva, S.Yu. Makarov. - Ed. 3rd ed. updated and supplemented - Vinnytsia: Nova Kniga, **2023**. -536 p.: ill.
2. Propaedeutics of pediatrics in syndromes: textbook / [O.R. Boyarchuk, M.I. Kinash, O.M. Shulgai and others]; ed. O.R. Boyarchuk, M.I. Kinash. – Ternopil: TNMU, **2022**. – 760 p.
3. Propaedeutics of childhood diseases with child care: Textbook 5th edition. Captain T.V. Vinnytsia: Nova Knyga, **2021**. - 832p.
4. Nelson textbook 21st Edition by Robert M. Kliegman, MD, Joseph St. Geme, Nathan J. Blum, Samair S. Shan, Robert C. Tasker, Karen M. Wilson, Richard E. Behrman Publisher: Elsevier, **(2020)**. 848
5. Order of the Ministry of Health of Ukraine No. 1590 dated September 13, 2024. "On the postponement of the criteria for assessing the physical development of children under 18 years of age."

Additional:

1. Propaedeutic pediatrics: a textbook for students of higher medical educational institutions of the IV level of accreditation / V. G. Maydannik [et al.]; ed. V. G. Maydannik; - 2nd ed., corrected and supplemented - Vinnytsia: Nova kniga, 2018.
2. Pediatrics: a textbook for students of higher educational institutions of the IV level of accreditation / edited by prof. O.V. Tyazhkoya. – Ed. 5th ed. and additional. – Vinnytsia: Nova Knyga, 2018. – 1152 p. : ill. (pp. 359-375).
3. Nelson's Fundamentals of Pediatrics: in 2 volumes. Volume 1 / Karen J. Markdante, Robert M. Kligman; translation of the 8th English edition. Scientific editors of the translation V.S. Berezenko, T.V. Pochynok. Kyiv: VSV "Medicine", (**2020**) . T1-378p., T2- 426 p.
4. Davidson's Medicine: Principles and Practice: 23rd Edition: in 3 volumes. Volume 1 / edited by Stuart G. Ralston, Ian D. Penman, Mark W.J. Stracken, Richard P. Hobson.: Medicine.- 2020.-258 p.

Compilers Associate Professor of the Department of Pediatrics No. 1

Antoshkina A.M., Associate Professor of the Department of Pediatrics No. 2

Karulina Yu.V.