

## **Physical Education and Health**

**(elective course)**

*Methodical instructions for self-studying of III nd year students of the  
specialty 222 «General Medicine»*

**UKRAINIAN MINISTRY OF PUBLIC HEALTH  
Kharkiv National Medical University**

**Department of Physical Education and Health**

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## **Topic 1**

**Dependence of force on working conditions. Nature of the force.  
Magnitude of the force. Classification of the main types of  
strength.  
(12 hours)**

**Relevance.** Increased intensity of life, mental stress and reduced physical activity lead to poor health, especially among young people. The struggle for health is an important factor that defines life under conditions of constant stress, unfriendly ecology and hypodynamics. One of the most effective and cost-effective means of improving health, disease prevention, increasing mental efficiency, increasing the level of physical fitness, organization of optimal leisure activities, the formation of a healthy way of life of students in modern conditions is physical education and sports. In order to live their lives well, to be prepared for work, the younger generation needs to grow up healthy. Strength training is essential to improve the health of students, especially young people.

**Aim.** To demonstrate that students with insufficient physical training have significantly more difficulties in adapting to the learning environment and are more prone to overtraining.

**Task for self-study  
in preparation for the lesson**

Theoretical questions

1. The concept of force and strength. Types of strength.
2. Factors that determine strength capabilities.  
Techniques and tools for developing strength skills: - technique for developing maximal strength; - technique for developing unbalanced strength; - technique for developing speed and strength skills and forceful vitality.
4. Techniques of strength training of swimmers.
5. Prevention of injuries and nutrition in the process of strength training.
6. Planning. And control of the power load. Testing of strength capabilities.
7. The dynamics of the natural development of the body.

**Test tasks**

1. What is not a physical attribute of a person?  
*A. Vitality*  
*B. Strength*  
*C. Slowness*

*D. Flexibility*

2. Force - is....

*A. The ability of a person to perform activities with certain physical exertion*

*B. Capability of the person to perform work for a significant amount of time without a decrease in capacity*

*C. Man's ability to perform manual activities at the minimum possible interval of time for given conditions*

*D. Man's ability to perform manual actions with the required movement amplitude*

3. What determines the level of a person's strengths.

*A. In the number of staff involved in the work*

*B. From the maximum inhalation at high exertion*

*C. On the peculiarities of their velocity properties*

*D. From manual actions in the smallest possible amount of time for the given conditions*

4. What is meant by the term "human strength"?

*A. Great muscles and a muscular body;*

*B. The ability to "stand up for oneself", to protect the girl, to show heroic behaviour;*

*C. The capacity to end an external attack or to overpower his actions through muscular exertion;*

*D. Ability to take an important weight.*

5. Under what conditions does the power of muscles manifest?

*A. During twisting;*

*B. Without any change in length;*

*C. During twisting;*

*D. At stretching.*

6. Which forces are differentiated depending on the force-speed-mass relationship?

*A. Isometric;*

*B. Static;*

*C. Powerful;*

*D. Speedy and forceful.*

7. What determines the maximum strength of the movement?

*A. The kind of sport that you have been doing for three hours;*

*B. The thickness and quantity of muscle fibres;*

*C. Cross-sectional area;*

*D. The strength of a person.*

8. In what units is absolute power measured?

*A. Kg/sm<sup>2</sup>;*

*B. Ampere;*

*B. Wat;*

*Г. Newtons /sm<sup>2</sup>.*

9. What is a "power deficit"?

*A. This is a disease that is accompanied by dystrophy of the muscles;*

*B. The difference between maximal strength and maximal strength;*

*C. Strength training deficiencies;*

*D. Congenital weakness of muscle.*

10. What is the goal of strength training in training sessions?

*A. Increase the volume of goods;*

*B. To fatigue the body;*

*C. To prolong lular training of the strength, to ensure its universal development and the possibility of its maximal manifestation in various kinds of manual activity;*

*D. To develop the ability to resist stiffness.*

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### **Topic 2**

**Speed, as a complex driving property. Elementary forms of performance of speed in various combinations and in combination with other physical properties and technical skills.  
(12 hours)**

**Relevance.** In the process of manual activity, modern man is constantly faced with the need to respond adequately to the expected challenges or those that have readily emerged. Scientific and technological progress creates an environment in which demands for speed, proper adequacy of response and

management actions are increasing. Speed of response and handling is one of the key success factors in most sports.

**Aim.** Formulate the concept of elementary forms of speed in various combinations and in combination with other physical qualities and technical skills to ensure complex manifestations of speed capabilities in complex handling activities, which are characteristic of training and competition activities.

### **Tasks for self-study In preparation for the lesson**

#### **Theoretical questions**

1. The means of developing speed.
2. Techniques for developing the speed of simple reactions.
3. Techniques for developing speed of complex reactions.
4. Methods of development of speed of cyclic reactions.
5. Methods of development of speed of acyclic movements.
6. Methodological errors during the development of speed.

#### **Test tasks**

1. What is meant by "speed"?
  - A. *An increase in the volume of swift muscle fibres;*
  - B. *Physical quality of a person which integrates a complex of his/her functional properties to ensure execution of manual actions in minimum time;*
  - C. *A person's ability to react thermally to subdivisions and to high-speed moves, which are performed in the absence of considerable external support;*
  - D. *Specific capacity of people to perform motor actions.*
2. What factors determine the manifestation of speed as a physical quality of humans?
  - A. *Dynamism of nervous processes, capacity and capacity of creatine phosphate energy source and buffer systems of organism;*
  - B. *The level of development of shvidkiznoy and vibro power;*
  - C. *Degree of development of bending, concentration of volitional forces;*
  - D. *Motivation to self-confidence.*
3. What is the most favourable period for the development of speed of movement reactions and frequency of movement?
  - A. *3-6 years;*
  - B. *7-12 years;*
  - C. *13-20 years;*

*D. 21-23 years.*

4. What are the main phases in most of the movements that are carried out at maximum speed?

*A. Dispersal;*

*B. Pre-propulsion;*

*C. With different concentrations of forces in space and time (with acceleration, splicing, tensioning, loosening);*

*D. The intrinsic stability.*

5. What are the types of mobility?

*A. Latency time of motor reactions;*

*B. Speed of single movement, frequency of movement;*

*C. Complex forms of speed abilities;*

*D. The use of the support on the interval and near the interval.*

6. What is "latent motor reaction time"?

*A. The time when the electrical impulse passes from the receptor to the brain;*

*B. The time required for the quick preparation of the athlete;*

*C. The time required for lactic acid removal from the muscle;*

*D. The time required for the start of lactic acid reduction after an external stimulus has been applied.*

7. In which cases is it easier to transfer the speed abilities gained in one speed drive to the other?

*A. The level of sports training is low;*

*B. The level of athletic preparation is high;*

*C. The level of athletic training is not affected;*

*D. Dependence is not stable.*

8. What is meant by the concept of a simple motor reaction?

*A. Reaction of the human organism;*

*B. A. Physical quality of a human being which encompasses a complex of his/her functional properties ensuring performance of grip actions in minimum time;*

*C. Response to a well-known respiratory subdivision by an unknown grip;*

*D. Specific capacity of human beings for motor reactions.*

9. What are the methods of development of simple motor reactions?

*A. Repeated performance of simple movements;*

*B. Repetitive exercises, "sensory technique" - performing exercises at a given time;*



*C. Intensive development of flexibility and concentration of volitional strength;*  
*D. The analytical approach, i.e. the gradual training of the speed of execution of individual movements, or in easier conditions.*

10. What is meant by the concept of a complex motor reaction?

- A. Reaction to an object that does not collapse and the reaction of choice;*
- B. Reaction to an object which is ruptured and a choice reaction;*
- C. A response to an object that is tampered with and a simple motor response;*
- D. Reaction to the object.*

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### **Topic 3**

#### **The importance of physical vitality in human life. General and special intrinsic value. Vitality level. (12 hours)**

**Relevance.** The role of physical culture in improving the health of the population is one of the main tasks of the new Ukraine. Particularly important physical culture is for children and young students, a high level of health and versatile physical development is a key to successful implementation of socio-economic transformation of our society. The problem of forming vitality in students goes beyond the framework of manual training, but is associated with such most important indicators as the level of health, physical activity, an individual style of life, the correlation with other manual skills.

**Aim.** Explain to the students the importance of physical vitality in human life.

**Tasks for self-study  
in preparation for the lesson**

Theoretical questions

1. The prevalence of obesity
2. Classification of obesity
3. Principles of prevention of obesity
4. Treatment of obesity

**Test tasks**

1. What is the concept of value for money?
  - A. The reaction of the human body to physical work;*
  - B. The physical quality of the individual, which encompasses the complex of his/her functional properties that ensure the performance of manual actions in the minimum amount of time;*
  - C. The ability to resist stagnation in any activity;*
  - D. A component of the physical abilities of the individual which also includes the ability to remain calm, be aware of space, have a sense of rhythm, and relax their muscles.*
2. What are the indicators of physical vitality?
  - A. Duration of work;*
  - B. The duration of work at a given power;*
  - C. The speed of mastering and executing movements with the specified parameters;*
  - D. Quantitative characteristics of the gears.*
3. What are the characteristics of work which determine its vitality?
  - A. The capacity of the work;*
  - B. The force and speed of the work;*
  - C. The coordination complexity of the work;*
  - D. Working conditions.*
4. At what capacity of work is absolute volatility manifested?
  - A. The maximum intensity of the work;*
  - B. Very low workload;*
  - C. Work with long rest intervals;*
  - D. Work with defined stroke parameters.*
5. What is the basis of the vitality methodology?
  - A. The duration of the work;*
  - B. The capacity of the work;*
  - C. The method of regulating the physical strain;*
  - D. Quantitative characteristic of the movement parameters.*
6. What is meant by the term 'total human capacity'?
  - A. Capability to perform a long time work of moderate intensity using a majority of muscles;*

- B. Willingness to perform short hours of work of moderate intensity with the use of most of the tools;*  
*C. Willingness to perform long hours of work of superfluous intensity with the use of most of the muscles;*  
*D. The ability to perform long hours of work of moderate intensity with the use of a minimum number of tools.*
7. What is the concept of "special human performance"?
- A. Attitude which does not belong to a certain activity chosen as the subject of specialization;*  
*B. Relative endurance;*  
*C. Vitality which is attributable to a particular activity chosen as the subject of specialisation;*  
*D. Specialized overall vitality.*
8. What are the zones of physical work performance?
- A. Maximum;*  
*B. Sub-maximal;*  
*C. Great;*  
*D. Moderate.*
9. What are the main objectives in the development of vitality?
- A. Educating the strength;*  
*B. Increasing aerobic capacity;*  
*C. Training in the strength and stiffness;*  
*D. Increasing anaerobic capacity.*
10. What are the additional factors in the education of special virtuosity?
- A. Adherence to a rational muscle activity;*  
*B. Increasing the physiological resistance to fatigue;*  
*C. Widening of the psychological range of resistance to fatigue;*  
*D. Educating the work ethic.*

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#### **Topic 4**

#### **The essence and significance of flexibility. Factors that determine the manifestation of suppleness. Stages of the development of thinness. Static differences. (12 hours)**

**Relevance.** Systematic exercise for the development and preservation of flexibility significantly accelerate the aging process, improves muscle tone, supplying them with sourness and vital resources, contributes to the removal of slags from the muscle tissue. These exercises help to prevent such an unpleasant disease as osteochondrosis, which manifests itself in headaches, numbness, back and joint pain, increased fatigue, and in some cases - in the work of internal organs. This is the reason for the attention given to the exercises on resilience in the process of exercising in all kinds of physical activities and sports.

**Aim.** Explain to students that sufficient flexibility and elasticity of joints, joints and ligaments reduces the likelihood of injury during forced jerky movements, e.g. when trying to keep upright on ice, straightening from a great angle, in an unrestrained fall, etc.

#### **Tasks for self-study in preparation for the lesson**

Theoretical questions

1. General characteristic of bending as a physical quality of human beings.

2. Factors that cause manifestation of flexibility.
3. Stages of the development of stiffness.
4. The basics of resistance development methods.
5. Gender differences.

### **Test tasks**

1. What is meant by the concept of flexibility?
  - A. The reaction of the human body to physical work;*
  - B. The physical quality of the individual, which integrates the complex of his/her functional properties, which ensures the performance of manual actions in the minimum amount of time;*
  - C. The ability to resist stiffness in any activity;*
  - D. Morphofunctional properties of the musculoskeletal apparatus, which determine the degree of rupture of the limbs.*
2. What is an indicator of flexibility?
  - A. The duration of work;*
  - B. The maximum amplitude of movement;*
  - C. Speed of mastering and executing the movements according to the given parameters;*
  - D. Quantitative characteristics of moves.*
3. What are the types of flexibility?
  - A. Active;*
  - B. Full;*
  - B. Passive;*
  - Г. Partial.*
4. What are the indicators of bending?
  - A. The strength of the muscles, the strength of the muscles, the age of the person;*
  - B. Moral and material stimulation;*
  - C. Strain on the nervous system and nerves, temperature of the environment;*
  - D. Elasticity of muscles and connections, innate abilities.*
5. What are the basic rules of bending methodology?
  - A. Reaching the optimum of flexibility, development of the reserve of flexibility;*
  - B. The frequency of repetitions, and the preceding refreshment;*
  - C. The use of the shortest age period for the development of the stiffness;*
  - D. Acquaintance with specialized literature.*

6. What are the tools for the development of flexibility?
  - A. General training and athletic exercises;*
  - B. Active and passive movements, single-phase and continuous movements;*
  - C. Static and dynamic strength, exercises on simulators;*
  - D. Fixed movements, stretching and body weight movements.*
7. What tools are used to measure the stiffness?
  - A. Height measure;*
  - B. A ruler;*
  - C. Angle measure;*
  - D. Weight measure.*
8. What are the causes of the disorder?
  - A. Improper feeding;*
  - B. Congenital abnormalities, pathologies due to injuries, general physical weakness;*
  - C. Lack of regularity in physical therapy;*
  - D. Occupational and occupational injuries as a result of educational deficiencies.*
9. What is the basis of the method of correction?
  - A. Developing a proper understanding of the school and its role in life;*
  - B. Active and passive movements, one-phase and continuous movements;*
  - C. Gradual mastering of the movements of the ends: setting the feet; full extension of the knees; flexion of the legs in the kulshovyh joints; exercises for the upper laminae of the backbone;*
  - D. Fixed moves, exercises with strains and with the shaft of the own body.*
10. What forms of obesity are distinguished in medicine and physical education?
  - A. Partial;*
  - B. Obesity;*
  - C. Exogenous;*
  - D. Endogenous.*

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## **Topic 5**

### **Equivocation. A sense of rhythm. Orientation in space. Factors that condition the development of coordination skills (10 hours)**

**Relevance.** The ability to maintain equilibrium is due to the combined mobilisation of the abilities of the visual, auditory, vestibular and somatosensory systems. The manual function is seen in the way a person controls his or her motor skills. It provides for manual activity, without which children cannot live a full life and their normal development.

**Aim.** To form the basic theoretical basis for the development of coordination skills of students in physical education and sport, the importance of coordination skills in manual activity, types of coordination, as well as an analysis of scientific and literary sources.

### **Tasks for self-study In preparation for the lesson**

Theoretical questions

1. General characteristic of coordination abilities.

2. Capability to control the timing, space and force parameters of the movement.
3. Efficiency to preserve equilibrium.
4. A sense of rhythm.
5. Alertness to orientation in space.
6. Consistency to the complete loosening of muscles.
7. Coordination of moves.
8. Factors conditioning the manifestation of coordination abilities.
9. The dynamics of natural development of coordination abilities.

### **Test tasks**

1. Equilibrium ...
  - A. The ability to maintain a stable position;*
  - B. Ability to walk evenly with eyes closed;*
  - C. Correct posture;*
  - D. Corrections with the introduction of non-standard output positions.*
2. The ability to maintain equilibrium is determined by the possibilities:
  - A. Healthy;*
  - B. Auditory;*
  - C. Vestibular;*
  - D. Somatosensory.*
3. Coordination is....
  - A. This is the ability of a person to coordinate the movements of the body lanes rationally while solving specific movement tasks;*
  - B. Directional improvement of the base of handles, the sum of which does not define physical activity;*
  - C. The performance of the right in accordance with a given rhythm;*
  - D. The most reasonable conditions for the performance of the physical movement.*
4. How is the root of the Greek word "techn" translated?
  - A. Imbalance;*
  - B. Filigranity;*
  - C. Mastery;*
  - D. Harmoniousness.*
5. Which of the following abilities is not a coordination ability?
  - A. The ability to accurately measure the amount of muscle power;*
  - B. Willingness to respond quickly to a start signal;*



- C. Efficiency to maintain equilibrium;*
- D. Efficiency to drive accurately in space.*
- 6. A. The rules for determining the level of coordination skills:
  - A. Kick the ball into the basket (basketball);*
  - B. Running 100 m;*
  - C. The shot put;*
  - D. Cross-country run 4 x 9 m.*
- 7. Identify from the list the coordination abilities
  - A. The capacity for force and timing parameters of the movement;*
  - B. The ability to perform simple entation;*
  - C. Tolerance to differentiation;*
  - D. Capability to induction.*
- 8. The physical exercises are more difficult and have elements of new ...
  - A. The development of the vestibular apparatus;*
  - B. The devices for the development of the equilibrium apparatus;*
  - C. The devices for developing a sense of rhythm;*
  - D. The means of developing coordinated skills.*
- 9. Indicators that allow you to identify the coordination abilities.
  - A. Randate;*
  - B. Asymmetric knotting of arms, legs, head, torso;*
  - C. The time it takes to master a new movement or the quality of the combination;*
  - D. Flick (an element of acrobatics);*
  - E. Erismann's test.*
- 10. Which methods are used to improve coordination?
  - A. Using teaching methods;*
  - B. With the help of the method of contrast tasks;*
  - C. Through methods of physical training;*
  - D. With the help of the stimulation method.*

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### **Topic 6**

## **Factors that determine spryness Physiological basis of spryness. Methodological techniques for the development of fitness. Exertion parameters to be used in the development of fitness (12 hours)**

**Relevance.** If a person is able to coordinate their movements well, perform them precisely according to the requirements of technology, successfully reorganize their activities depending on the conditions that occur in the process of the movement, and learn physical movements quickly, then they can be said to be fast. If the coordination abilities of the person are not sufficiently developed, she tries to control her body movements by means of fixation of a significant number of joints.

**Aim.** Explain to students that speed is important in extreme manual activities, especially where space and time are at a premium.

### **Tasks for self-study In preparation for the lesson**

#### **Theoretical questions**

1. General characteristic of speed as a physical property of a person.
2. Factors that determine the manifestation of fitness.
3. Basics of fitness training methods.
4. Methodological failures during the development of coordination abilities.
5. Control over the development of the coordination skills.

### **Test tasks**

1. What is the test right for the determination of speed?

*A. Run 4 x 9m*

*B. The 30m run*

*C. The 60m run*

2. Що розуміють під поняттям спритності?

*A. Реакцію організму людини;*

*Б. Фізичну якість людини, що об'єднує комплекс її функціональних властивостей, що забезпечують виконання рухових дій в мінімальний час;*

*В. Здібність людини швидко навчатися новим руховим діям та швидко*

*перебудовувати рухові дії відповідно до обставин, які постійно змінюються;*

*Г. Складова координаційних здатностей людини, яка охоплює також здатності до рівноваги, орієнтування у просторі, відчуття ритму, довільного розслаблення м'язів.*

3. What is the measure of speed?

*A. Coordination of movements;*

*B. Accuracy of movement;*

*C. Speed of mastering and execution of runs with specified parameters;*

*D. Quantitative characteristics of runs.*

4. What is the age period for the greatest development of speed?

*A. 2-5 years;*

*B. 6-18 years;*

*C. 19-21 years;*

*D. 22- 31 years.*

5. What are the types of actions (exercises for speed)?

*A. Not very stereotypical;*

*B. Relatively stereotypical;*

*C. Non-stereotypical;*

*D. Many structural.*

6. What other physical properties determine the maximum speed?

*A. Isometric force;*

*B. Dynamic force;*

*C. Flexibility;*

*D. Dexterity.*

7. What are the methods of agility training?

*A. The use of non-conventional exiting positions, "mirror" performance of tasks;*

*B. Change of speed and tempo of movement, change of space in which the movement is performed;*

*C. A change in the way the lift is performed, change of opposition in group or pair techniques;*

*D. Improvement of corrections with additional moves, and the execution of familiar moves in new ways.*

9. What is the most important element in agility training methodology?

*A. Repetition;*

*B. Novelty;*

*B. Stress;*

*Г. Fatigue.*

10. What are the related skills that affect a person's dexterity?

*A. The desire for unreasonable muscular tension, the ability to maintain equilibrium, the improvement of the sense of space;*

*B. Dynamic and static strength;*

*C. Active and passive stiffness;*

*D. Dexterity.*

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