

**Physical Education and Health**  
(elective course)

*Methodical instructions for self-studying of III nd year students of the  
specialty 222 "General Medical"*

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

**Department of Physical Education and Health**

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(elective course)**

***Methodical instructions for self-studying of III nd year students of the  
specialty 222 "General Medical "***

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Compilers: V.V. Shuteyev  
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## **Topic 1: Methods and tools for improving strength development and their control.**

**Duration of study: 2 classes, 4 hours.**

**The context of the topic:** Strength as a physical quality is viewed in the following forms: absolute (maximal) - the highest capacity that a person is able to exhibit at the highest possible physical speed; speedy - the capacity of the neuromuscular system to mobilize the functional potential for achieving high strength indicators in the shortest possible time. It is differentiated depending on the value of the strength manifested in the manual activities. The one manifested in conditions of sufficiently high supports is called turbulent, and the one manifested in conditions of resistance to small and medium supports with high initial speed is called starting; force capacity is the ability of the body to maintain a sufficiently high level of force for a long period of time.

**The aim of the class:** To introduce students to methods and tools to improve their development.

### **Graphological structure of the topic:**

#### **Class plan**

- |   |                |
|---|----------------|
| 1. Introduction   | <b>30 min.</b> |
| 2. Reviewing knowledge of what has been learned             | <b>30 min.</b> |
| 3. Exploring methods to improve the development of strength | <b>45 min.</b> |
| 4. Exploring ways to improve the development of strength    | <b>45 min.</b> |
| 5. Summing up of the results                                | <b>30 min.</b> |

#### **Educational and material support for the class:**

1. Sports equipment necessary to achieve a specific goal (athletics equipment, loads of different strengths, exercise equipment, sports games equipment, cuffs, gymnastics mats, etc.).
2. Stopwatch, sports whistle, instructions.

#### **Practical activity card**

<b>№ p/c</b>	<b>Educational material</b>	<b>Methodological guidelines</b>
1	Reviewing knowledge of what has been learned	Questioning students
2	Exploring methods to improve the development of strength	Know methods of improving the development of strength
3	Exploring ways to improve the development of strength	Know how to improve the development of strength
4	Summing up	

## **Plot**

Training of any orientation is accompanied by regulatory and structural metabolism alterations, but the level of expression of these adaptation changes depends on the magnitude of the applied strain, the mode and speed of muscle mass reduction, the duration of training and the individual composition of the muscular tissue are reflected in the choice of methods for the development of individual strength abilities.

The nature of all exercises that help to develop strength are divided into the main groups:

1. General impact on the muscles;
2. Regional impact on the muscles;
3. Local impact on the muscles.

There are two important reactions for the manifestation of power through neuroregulatory mechanisms: increase of impulses frequency and recruitment of additional rudimentary units. Depending on the magnitude of the voltage, the force manifestation is ensured by a complex interaction of these mechanisms.

Techniques for developing strength:

1. The method of repeated strength.
2. The method of maximal forces.
3. The method of dynamic forces.
4. Isometric-force method.
5. Combined method.

In the development of strength, an extreme or full rest interval is most often used.

When developing methods of speed strength development it is necessary to focus on improving the main factors that determine the level of this quality, as well as the peculiarities of their implementation in relation to the specifics of different sports. The main factors determining the level of speed force are internal coordination and speed of movement of running units.

Strength training includes exercises:

- with the weight of the objects;
- with the support of elastic objects;
- on special simulators. Very effective are also exercises:
- with the support of partners;
- supported by the weight of the own body;
- in the support of the body weight with additional strains.

## **Checking questions:**

1. Types and forms of force.
2. Factors affecting the development of strength.

- Characteristics of traditional methods of strength development.
4. Non-traditional methods of strength development.
  5. What are the groups of muscles to be trained?
  6. Which training method should be used?
  7. Which energy management system should be used as a priority?
  8. What should be considered in order to prevent injuries?

### **Recommended literature**

#### **Base literature**

1. Platonov V. N. The system of training athletes in Olympic sport. General theory and its practical applications: [textbook for students of higher educational institutions of physical education and sport] / V. N. Platonov. - B. : Olympic literature, 2004.. – 808 p. – ISBN 966-7133-64-8.

#### **Additional literature**

1. Adaptation of athletes to training and competition loads // Collection of scientific papers. - B.: KHIFK, 1984. – 109 p.
2. Ashmarin B.A. Theory and Methodology of Pedagogical Research in Physical Education: [guide for undergraduates, postgraduates and teachers]. / Ashmarin B.A. – M.: Physical education and sport, 1978. – 233 p.

#### **Information resources**

1. Distance learning: <http://distance.knmu.edu.ua/course/view.php?id=3516>

## **Topic 2: Methods and tools for improving speed development and their control.**

**Duration of study: 2 classes, 4 hours.**

**The context of the topic:** Considering that elementary manifestations of speed as a physical property are relatively independent of one another, they should be developed separately. Therefore, it is worth considering separately methods for improving all components of speed as a complex driving characteristic.

The activities: exercises that require fast reactions, high speed of individual moves, maximum frequency of moves.

**The aim of the class:** To familiarise the students with the methods and equipment of speed development.

### **Graphological structure of the topic:**

#### **Class plan**

- |  |                |
|--|----------------|
| 1. Introduction  | <b>30 min.</b> |
| 2. Reviewing knowledge of what has been learned          | <b>30 min.</b> |
| 3. Exploring methods to improve the development of speed | <b>45 min.</b> |

4. Exploring ways to improve speed development
5. Summing up of the results

**45 min.**  
**30 min.**

### **Educational and material support for the class:**

1. Sports equipment necessary to achieve a specific goal (track and field equipment, sports games equipment, etc.).
2. Stopwatch, sports whistle, methodical instructions.

### **Practical activity card**

№ p/c	Educational material	Methodological guidelines
1	Reviewing knowledge of what has been learned	Questioning of students
2	Exploring methods to improve the development of speed	Know how to improve the development of speed
3	Exploring ways to improve speed development	Know how to improve speed development
4	Summing up	

### **Plot**

#### **Methodology for developing and improving speed**

Considering that elementary manifestations of speed as a physical quality are relatively independent of one another, they should be developed separately.

The speed is a complex value, which manifests itself through:

1. Speed of the manual reactions;
2. Speed of performing un-tensioned single movements;
3. Frequency (tempo) of non-tensioned moves;
4. Quick start of moves, which in sports practice is called rashness.

Methods of developing speed:

1. Method of repetition of the moves with maximum force.

It is based on the repetition of simple and difficult movements with a maximum amount of strength. The resting time must be sufficient to regain the strength expended.

2. A method for correcting the response to a non-suppressed impulse.

Develops the player's responsiveness in assessing the situation and helps him to solve the game tasks quickly and efficiently.

3. The method of repeated ruptures under mild conditions.

Used to develop stable speed (sprinting) and to increase the frequency of leg movements.

Methodologies for the exercise:

1. Repetitive method (for developing speed).
2. the interval method (for the development of speed performance).
3. The repeated-interval method (for the development of speed performance).

4. Method of competition (mainly as a control).

When perfecting the reactions, the principle of an analytical approach is followed, i.e. the technique of responding to a questionnaire is learned well in the beginning.

In parallel or at a later stage, develop the speed of response under non-specified easy conditions and with the use of technical devices.

The following guidelines should be followed when improving speed performance:

- the exercise must be carried out at a limited speed;
- the intervals of the rest period should allow each trial to be as good as the previous one;
- tools and methods aimed at improving speed are varied, in order to avoid the creation of a "speed bar";
- activities for the development of speed should be carried out after sufficient rest.

The main methods of developing speed skills are:

1. The method of the strictly regulated exercise;
2. Automatic method;
3. The game method.

Speed is developed to a much smaller extent than other physical abilities.

### **Techniques for the development and improvement of speed.**

The following requirements apply to the physical power tools as a means of improving speed:

1. Their technology must be such that they can be operated at a limited speed;

They must be well-mastered, so that the pupils' effort is not reduced to the way they are performed, but to the speed of their performance; - Their duration must not exceed 30 seconds;

3. They must be adequate for the particular manifestation of speed and conditions of the manual action;

4. They should be varied and provide for improvement of speed in conjunction with the development of other attributes.

### **Checking questions**

1. A general characteristic of speed as a physical quality of human beings.
2. Factors that determine the manifestation of speed.
3. Fundamentals of speed development techniques.
- Monitoring the level of development of speed.



4. Directions for the improvement of speed and "explosive power".

### **Recommended literature:**

#### **Based literature**

1. Platonov V. N. The system of training athletes in Olympic sport. General theory and its practical applications: [textbook for students of higher education institutions of physical education and sport] / V. N. Platonov. - B. : Olympic literature, 2004. – 808 p. – ISBN 966-7133-64-8.
2. Shiyan B.M. Theory and Methodology of Physical Education of Schoolchildren : [handbook for students of Higher Education in Physical Education and Sport] : in 2nd p. / B. M. Shiyan. - T. : Educational book - Bogdan, 2004. – P. 1. – 272 c. ; P. 2. – 248 p.

#### **Additional literature**

1. Linets M.M. Fundamentals of methodology for the development of manual skills: Tutorial. Manual / M. M. Linets. - L. : Stabar, 1997.

#### **Information resources**

Distance learning: <http://distance.knmu.edu.ua/course/view.php?id=3516>

### **Topic 3: Methods and tools to improve the development of vitality and their control.**

**Duration of study: 2 classes, 4 hours.**

**The context of the topic:** The results of the assessment of the peculiarities of the development of the leading indicators of the functional state of the organism of the students testify to the fact, that in the natural conditions of the educational activity during the period of medical education in the higher educational institution a sufficiently large number of professionally significant psychophysiological functions continues to develop. Therefore one of the tasks is to make the students understand the importance of developing vitality as a physical characteristic for the training of a medical professional and to know the rules that contribute to this.

**The aim of the class:** To familiarise students with the methods and tools for improving vitality.

### **Graphological structure of the topic:**

#### **Class plan**

- |   |                |
|---|----------------|
| 1. Introduction   | <b>30 min.</b> |
| 2. Reviewing knowledge of what has been learned                 | <b>30 min.</b> |
| 3. Exploring methods to improve the development of vitality     | <b>45 min.</b> |
| 4. Consideration of ways to improve the development of vitality | <b>45 min.</b> |
| 5. Summing up of the results                                    | <b>30 min.</b> |

### **Educational and material support for the class**

1. Sports equipment necessary to achieve a specific goal (track and field equipment, ropes, dumbbells, barbell bars, weight machines, etc.).
2. Stopwatch, sports whistle, instructions.

### **Practical activity card**

№ p/c	Educational material	Methodological guidelines
1	Reviewing knowledge of what has been learned	Questioning of students
2	Exploring methods to improve the development of vitality	Know how to improve the development of vitality
3	Consideration of ways to improve the development of vitality	Know how to improve the development of vitality
4	Summing up of the results	

### **Plot**

The level of vitality development is determined by the energetic potential of the human organism and its compliance with the requirements of specific manual activities, the efficiency of the technique of manual activities, and the psychological abilities of those involved in them. The latter ensure not only a high level of muscular activity during training and physical confrontation with the opponent, but also the removal of fatigue and prevention of the process of its development.

For practical purposes, vitality can be subdivided into types:

1. General.
2. Specific.

The indicators of volatility are:

- the operating time (absolute operating time);
- the duration of operation at a specified capacity (intrinsic or partial capacity).

Methods to improve the development of vitality:

1. The method of continuous exercise with variable and variable intensity;
2. The method of repeated interval exercise;
3. Circular training method;
4. Game method;
5. Competitive method.

Methodology for the development of vitality:

1. Development of the capacity of the functional systems of aerobic energy

supply;

2. Development of aerobic energy source capacity;
3. Improvement of functional and technical economics;
4. Increased capacity and capacity of the body's buffer systems.

The means of education for vitality:

- be easy to implement and accessible to all students;
- they must be actively used by most of the skeletal muscles;
- their performance should result in the activation of the functional

systems;

- their performance allows for dosage and regulation of the exertion;
- they can be performed for a long period of time (from a few weeks to

a few years).

### **Checking questions:**

1. A general characteristic of vitality as a physical quality of human beings.
2. Types of vitality.
3. Methods of developing and improving vitality.
4. Control of the development of the level of vitality.

### **Recommended literature:**

#### **Base literature**

1. Platonov V. N. The system of training athletes in Olympic sport. General theory and its practical applications: [textbook for students of higher education institutions of physical education and sport] / V. N. Platonov. - B. : Olympic literature, 2004. – 808 p. – ISBN 966-7133-64-8.
2. Shiyani B.M. Theory and Methodology of Physical Education of Schoolchildren : [handbook for students of Higher Education in Physical Education and Sport] : in 2nd p. / B. M. Shiyani. - T. : Educational book - Bogdan, 2004. – P. 1. – 272 c. ; P. 2. – 248 p.

#### **Additional literature**

1. Linets M.M. Fundamentals of methodology for the development of manual skills: Tutorial. Manual / M. M. Linets. - L. : Stabar, 1997.

#### **Information resources**

Distance learning: <http://distance.knmu.edu.ua/course/view.php?id=3516>

## **Topic 4: Methods and tools to improve the development of bending and their control.**

**Duration of teaching:** 2 classes, 4 hours.

**The context of the topic:** The effect of physical strength on flexibility is extensive and effective. The right to flexion does not only increase the amplitude of the movement, but also influences the formation of the muscle fibres in a certain way.

**The aim of class:** The main methods and means of developing improved bending.

### **Graphological structure of the topic:**

#### **Class plan**

- |  |                |
|--|----------------|
| 1. Introduction  | <b>30 min.</b> |
| 2. Reviewing knowledge of what has been learned            | <b>30 min.</b> |
| 3. Exploring methods to improve the development of bending | <b>45 min.</b> |
| 4. Exploring ways to improve the development of bending    | <b>45 min.</b> |
| 5. Summing up of the results                               | <b>30 min.</b> |

#### **Educational and material support for the class**

Skiping ropes, dumbbells, weight plates, barbell bars, shock absorbers, strength training equipment.

#### **Practical activity card**

№ p/c	Educational material	Methodological guidelines
1	Reviewing knowledge of what has been learned	Questioning students
2	Exploring methods to improve the development of bending	Know the methods of improving the development of bending
3	Exploring ways to improve the development of bending	Know how to improve the development of bending
4	Summing up	

#### **Plot**

Physical movements are used for the formation of flexibility, in which the amplitude of movements is brought to a unique limit - the one in which bonds and ties are stretched to the maximum possible without causing damage. This type of corrections is called "tensioning corrections". The vast majority are gymnastic corrections, the good of which makes it possible to exert vibrational impact on the body. In some of them the main stretching forces are tensile forces of the muscles, while in others - external forces. Therefore, stretching movements are divided into active and passive ones. In addition, there are many stretching rules whose effect is ensured by both internal and external forces without a clear advantage of one or the other. These movements are called active-passive movements (e.g. plunging movements in a wide lunge or twine).

In the general totality of rules aimed at the development of flexibility, active rules prevail, because in real life conditions flexibility manifests itself

mainly in its active forms. At the same time, some value is attached to passive stretching exercises. They are an effective means of increasing and preserving the stock of stiffness and contribute to increasing the amplitude of active movements.

The main methods of developing bending:

1. The method of multiple stretching;
2. The method of static stretching.

The exercises to develop flexibility can be divided into 3 types of exercises: power exercises, exercises on loosened muscles and exercises to stretch the muscles, joints and tendons.

Techniques for the development of stiffness:

1. Active exercises.
2. Passive movements.
3. Static corrections.

### **Checking questions**

1. Vulnerability and the factors that determine its development.
2. The role of flexibility in human life.
3. Types of flexibility.
4. Means and methods of shaping bending.
5. Methods of teaching bending.
6. Control exercises for determining the level of flexibility development.

### **Recommended literature:**

#### **Base literature**

1. Platonov V. N. The system of training athletes in Olympic sport. General theory and its practical applications: [textbook for students of higher education institutions of physical education and sport] / V. N. Platonov. - B. : Olympic literature, 2004. – 808 p. – ISBN 966-7133-64-8.
2. Shiyan B.M. Theory and Methodology of Physical Education of Schoolchildren : [handbook for students of Higher Education in Physical Education and Sport]: in 2nd p. / B. M. Shiyan. - T. : Educational book – Bogdan, 2004. – P. 1. – 272 c. ; P. 2. – 248 p.

#### **Additional literature**

1. Linets M.M. Fundamentals of methodology for the development of manual skills: Tutorial. Manual / M. M. Linets. - L. : Stabar, 1997.
2. Keneman A.V. Theory and methods of physical education of preschool children / A.V. Keneman, D.V. Khukhlaeva. - 3rd ed. amended and supplemented - M. : Promotion, 1985. – 256 p.
3. Matveev L.P. Theory and Methodology of Physical Education: Textbook for Institutes of Physical Education / edited by L.P. Matveev, A.D. Novikov. - 2nd ed., revised and extended. - M. : Physical Education and Sport, 1976. – T. 2. –

256 p.

4. Rusova S. F. Theory and practice of pre-school education / S.F. Rusova. - L. ; Krakow ; Paris : Prosvita, 1993. – 127 p.

#### **Information resources**

Distance learning: <http://distance.knmu.edu.ua/course/view.php?id=3516>

### **Topic 5: Methods and tools for improving the development of coordination and their control.**

**Duration of teaching:** 2 classes, 4 hours.

**The context of the topic:** Performing coordination skills exercises enables the person to coordinate the movements of the body parts in a rational manner for specific manual tasks, which is necessary for the further use of skills in the professional and applied activity of the future physician.

**The aim of topic:** Develop the ability to work with a variety of tools.

#### **Graphological structure of the topic:**

##### **Class plan**

- |  |                |
|--|----------------|
| 1. Introduction  | <b>30 min.</b> |
| 2. Reviewing knowledge of what has been learned          | <b>30 min.</b> |
| 3. Exploring methods to improve coordination development | <b>45 min.</b> |
| 4. Exploring tools to improve coordination development   | <b>45 min.</b> |
| 5. Summing up of the results                             | <b>30 min.</b> |

##### **Educational and material support for the class**

1. Sports equipment necessary to achieve a specific goal (athletics equipment, bars of different heights, gymnastics benches, balls, rope, various wraps), musical equipment.
2. Stopwatch, sports whistle, methodical instructions.

##### **Practical activity card**

No p/c	Educational material	Methodological guidelines
1	Reviewing knowledge of what has been learned	Questioning students
2	Exploring methods to improve coordination development	Know methods to improve coordination development
3	Exploring tools to improve coordination development	Know how to improve the development of coordination
4	Summing up	

## **Plot**

Coordination skills include:

1. Willingness to learn new skills;
2. Ability to differentiate and control different characteristics of movements;
3. Ability to improvise and to perform combinations in the process of manual activity.

For the development of coordination skills, complex, non-traditional movements are used, which differ from the usual ones by their novelty and the need to make tactical decisions: games, elements of acrobatics, gymnastics, numerous relay races, as well as exercises with the introduction of non-standard exiting positions, with variations in speed and pace of moves, with a mirror execution, with variations in standard execution, with complications of everyday actions with additional moves, with a combination of routine actions in non-standard combinations, with the introduction of additional signal units, and activities requiring a quick change of action, with changes in the space in which the activity is carried out, using the natural and piecemeal conditions of the environment to increase the variability of the handling skills.

Improving coordination skills means accumulating a large number of manual skills and developing ways of integrating them promptly into complex manual activities.

Development of coordination skills:

1. Method of muscular force differentiation (improvement of perception of velocity capabilities of muscles, most often used dynamometer);
2. Differentiating movements in time and space (to perform precise movement actions according to given time parameters);
3. Improvement of equilibrium functions (execution of moves under difficult conditions);
4. Improvement of vestibular stoicism (perform vestibular apparatus).

### **Checking questions:**

1. Co-ordination as a manual skill of human beings.
2. Types of coordination abilities
3. What factors determine the directness of people's coordination abilities.
4. What tools and techniques for developing coordination abilities do you know?
5. How to control the development of coordination skills.

### **Recommended literature:**

#### **Base literature**

1. Krutsevid T. Y. Theory and Methodology of Physical Education: [handbook for students of physical education and sport] / edited by T.Y. Krutsevid. - B. : Allympic Literature, 2008. – V. 2. – 366 p. – ISBN 966-7133-97-4.

2. Vilchkovskiy E. S. Theory and Methodology of Physical Education of Pre-School Children / E. S. Vilchkovskiy. - L. : VNTL, 1998. – 336 p.
3. Dmitrenko T.I. Theory and Methodology of Physical Education of Children of Early and Pre-School Age: Textbook for Pre-School Departments of Pedagogical Institutions and Students of Pre-School Departments of Pedagogical Institutions / T.I. Dmitrenko. - K. : Higher School, 1979. – 242 p.

#### **Additional literature**

1. Khudoly O.M. Fundamentals of Gymnastics Methodology: Textbook ,2004.- P.234-244.
2. Shiyan B.M. Theory and Methodology of Physical Education of Schoolchildren. Part 1.-Ternopil: The Teaching Book - Bogdan, 2001.-P.233-244.

#### **Information resources**

1. Distance learning: <http://distance.knmu.edu.ua/course/view.php?id=3516>



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