HEALTH MINISTRY OF UKRAINE
ODESA NATIONAL MEDICAL UNIVERSITY
Department of rehabilitation medicine

"APPROVED"
Acting vice-rector on scientific-academic education,
_____ prof. I.P. Shmakova
"01" вересня 2021

**WORKING PROGRAM FOR**
**"CURRENT PROBLEMS OF PHYSIOTHERAPY, BALNEOLOGY AND REHABILITATION"**

Level of higher education: the second (master`s)
Brach of knowledge: 22 «Health Care»
Specialty: 222 «Medicine»
Educational qualification: «Medicine»

Odessa 2021-2022

The working program was composed on the basis of the educational-professional program "Medicine" of the second level of higher education on preparation of masters in the specialty 222 "Medicine", branch of knowledge: 22 "Health Care" approved by the Academic Council of ONMedU from 04.06.2020 (protocol No. 11).

Composed by: Dr. med. sciences, prof. I.P. Shmakova, assistant I.G. Pavlotska.

Program was discussed on meeting of Department of rehabilitation medicine (prot. No. 12 "29" June 2021
Head of the department, dr. med. sciences prof. _____ Shmakova I.P.

The working program was approved at the meeting of the subject methodological commission of therapeutic specialties of ONMedU 27.08.2021 (prot. No. 1).
Head of the subject cyclic methodological commission for therapeutic disciplines, Dr. med. sciences, prof. _____ Matsegora N.A.

The program was approved at a meeting of the Central Coordination and Methodological Council of ONMedU from 30.08.2021 (prot. No. 1)

## 1. Description of the discipline:

| Index number | Characteristics of the discipline | |
|---|---|---|
| | Full-time study | |
| Total number: | Compulsory | |
| Credits - 3.0 | Year of study | 4 |
| Hours – 90 | Term | VII - VIII |
| Informative subsections - 1 | Lectures | 0 |
| | Practical classes | 20 hours |
| | Incl. individual tasks | 70 hours |
| | Individual work | 0 |
| | Form of final control | Final test |

## 2. The purpose and objectives of the discipline

**Objective:** is to form students' ability to use various physical factors and techniques to help the patient achieve maximum physical, mental, professional, social and economic fullness, which he will be able to within the range of the existing disease.

**Tasks:**

1. Formation of knowledge of the modern arsenal of physiotherapeutic agents: electric currents and electromagnetic fields, ultrasonic, shock wave, artificial light, refrigerants, heat carriers, mechanical medical influences, mineral medical water, therapeutic mud, climatic factors, etc.
2. Mastering basic views on the mechanisms of action of physical therapeutic agents and principles of their administration and application; basic provisions and principles of medical rehabilitation;
3. Acquaintance with modern physiotherapeutic equipment, which are used at the department, the peculiarities of its application; with structure and activity of the rehabilitation center of Odessa.

**The process of studying the discipline is aimed at forming elements the following competencies:**

**General competencies** as required by the National Qualifications Framework (NQF)

GC1 Ability to abstract thinking, analysis and synthesis; ability to learn and be modernly trained

GC2 Knowledge and understanding of the subject area and understanding of the profession

GC3 Ability to apply knowledge in practical situations

GC4 Ability to communicate in the state language both orally and in writing; ability to communicate in a second language

GC5 Skills in the use of information and communication technologies

GC6 Ability to search, process and analyze information from different sources

GC7 Ability to adapt and act in a new situation; ability to work autonomously
GC8 Ability to identify, pose and solve problems
GC9 Ability to choose a communication strategy
GC10 Ability to work in a team
GC11 Interpersonal skills
GC12 Ability to act on the basis of ethical considerations (motives)
GL13 Safe activities skills
GC14 Ability to assess and ensure the quality of work performed
GL15 Desire to preserve the environment
GC16 Ability to act socially responsible and civic conscious

**Special (professional, subject) competencies.**

Professional competencies of the master's specialty are the ability to implement the following professional responsibilities by the type of activity:
SC1 - Ability to establish a preliminary clinical diagnosis of the disease
SC2 - Evaluation of results of laboratory and instrumental studies
SC3 - Skills of taking a patient's information
SC4 - Diagnosis of emergencies
SC5 - Planning and implementation of disease prevention measures
SC6 - Determination of the nature and principles of treatment
SK7 - Determination of the necessary mode of work and rest, diet in treatment of diseases of internal organs
SC8 - Determination of tactics of patient management in somatic pathology
SC9 - Treatment of infectious diseases
SC10 - Determination of tactics and providing emergency medical aid

**Integrative program learning outcomes:**

PLO1 - Have communication skills and skills of clinical examination of the patient. Take data on patient's complaints, medical history, and life history.
PLO2 - Evaluate diagnosis information using standard procedure, based on results of laboratory and instrumental studies. Determine the list of required clinical and laboratory and instrumental studies and evaluate their results.
PLO4 - Determine the principles of treatment of diseases, the required mode of operation and rest, the nature of food.
PLO8 - Perform medical procedures.
PLO14 – Keep medical records.
PLO17 - Plan, implement and analyze activities for the organization and integration of medical care to the population.
PLO18 - Adhere to the requirements of ethics, bioethics and deontology in their professional activities

**Expected learning outcomes. As a result of studying the curriculum of the discipline the student must:**

**Know**:
- specificity of approaches in accordance with the biopsychosocial model;
- strategies of medical rehabilitation and their pathophysiological bases, rehabilitation prognosis;
- principles of patient-centeredness in rehabilitation therapy;

- principles of organization of physical and rehabilitation medicine;
- rehabilitation technologies;
- principles of creation and application of individual rehabilitation programs;
- ability to apply the principles of effective cooperation with others health professionals;
- regulations of the health care system, especially in the field of protection of rights patients;

**Be able to:**

- assess the need for a team approach, in particular, the involvement of others specialists, doctors of other specialties in the process of providing medical care;
- determine health and community needs and take appropriate action measures aimed at preserving and promoting health and diseases;
- know and apply the principles of evidence-based medicine;
- know and apply the principles of medical ethics and deontology;
- know the importance and effective way of keeping medical records to apply in the work according to operating norms;
- know the organization of the health care system and be able to take responsibility, participate in the management of activities such as needs assessment, action planning for improving measures to increase the efficiency and development of the quality of the health care system.

**Master the skills:**

- Communication and clinical examination of the patient.
- Determination of indications and contraindications for methods of medical rehabilitation.
- Keeping medical records

## 3. The content of the discipline

**Topic 1**. The place and role of physiotherapy, balneology and medical rehabilitation in the health care system of the population of Ukraine. Classification of physical factors, mechanisms of therapeutic action, indications and contraindications to use. Technique and methods of procedures.

Physiotherapy, mechanisms of physiological and therapeutic action of natural and preformed physical therapies per person. General principles of physiotherapy.

Physioprophylaxis. Preventive, health-improving use of physical factors in primary, secondary and tertiary prevention. Mainly water, air, solar and ultraviolet rays, artificial air ions, dosed physical activity are used for primary prevention. Preformed physical factors are used for secondary prevention. The whole arsenal of physical treatments can be used for tertiary prevention.

Spa. Preventive and therapeutic use of natural physical remedies: mineral waters, peloids, healing climate, ozokerite, naphthalene, etc., and also about the organization of resort business.

Medical rehabilitation. Basic tasks and principles of medical rehabilitation. The main groups of patients who are subject to medical rehabilitation.

Classification of physical therapies and methods. Basic principles of using physical treatment and prevention. Mechanisms of physiological and therapeutic

effects of physical factors, taking into account the age of patients (adults and children).

**Topic 2**. The use of electric currents and electromagnetic fields in clinical practice (direct, pulse and alternating currents; electromagnetic fields of HF, UHF, microwave, EHF, high tone therapy). Mechanisms of action, indications, contraindications, techniques and methods of giving procedures.

Galvanization, electrophoresis of medicinal substances, diadynamotherapy, amplipulse therapy, interference therapy, fluctuation, percutaneous electrostimulation therapy (PEST), electrical stimulation, electrosonotherapy, transcranial electroanalgesia, darsonvalization, ultratone therapy, franklinization, infitherapy, magnetic therapy (constant, alternating and other magnetic fields), ultra-high frequency therapy (UHF therapy), inductothermy, SHF therapy, DHF therapy, EHF therapy, HiToP.

Physical-chemical effects. Physiological and therapeutic mechanisms of action. Methods of application in adults and children. Indications and contraindications taking into account age restrictions and features. Apparatuses.

**Topic 3.** Phototherapy. Laser therapy, magnetic therapy, magnetic laser therapy. Use of ultraviolet, visible and infrared light for therapeutic and prophylactic purposes. Mechanisms of action, indications and contraindications, technique and methods of giving procedures.

Non-selective chromotherapy (visible light), infrared radiation, ultraviolet radiation (long-wave, medium-wave in subertemic and erythematous doses, short-wave ultraviolet radiation), red and infrared laser therapy, magnetic therapy, magnetic laser therapy. Physical-chemical effects. Physiological and therapeutic mechanisms of action. Methods of application in adults and children. Indications and contraindications taking into account age restrictions and features. Apparatuses.

**Topic 4**. Mechanical factors. Mechanisms of therapeutic action. Ultrasonic, shock wave therapy indications, contraindications, techniques and methods procedures. Physicopharmacotherapy. Organization of physiotherapy service in Ukraine (seminar-excursion to the balneal-physiotherapeutic department of the basic sanatorium).

Acupressure, acupuncture, medical applicators, medical banks, barotherapy (hyper- and hypobarotherapy), vacuum decompression, vacuum massage, therapeutic vibration, vibrovacuum therapy, immobilization medical, manual therapy, massage, mechanotherapy, medical traction, phonotherapy. Ultrasound (ultraphonotherapy), shock wave, ultrasound puncture, ultraphonophoresis with drugs.

Physical-chemical effects. Physiological and therapeutic mechanisms of action. Methods of application in adults and children. Indications and contraindications taking into account age restrictions and features. Apparatuses. Excursion seminar in the balneo-physiotherapeutic department of the basic sanatorium.

**Topic 5**. The main spa therapeutic factors (climate, mineral water, mud). Mechanism of action, indications, contraindications. Heat treatment. Hydrobalneotherapy. Technique and methods of procedures. Cryotherapy.

The main climatic regions of Ukraine, climatic resorts of the world. Climatotherapy. Hydrotherapy (showers, medicines, contrast baths, etc.). Mineral waters (for internal and external use), balneotherapy (radon, hydrogen sulfide, iodobromine, nitrogen, silica, iron, carbonic baths). Heat treatment (paraffin therapy, ozokeritotherapy, naphthalanotherapy, clay therapy, psammotherapy), cryotherapy (local and general). Peloidotherapy (silt, peat, sapropel, volcanic, hydrothermal mud).

Physical-chemical effects. Physiological and therapeutic mechanisms of action. Methods of application in adults and children. Indications and contraindications taking into account age restrictions and features.

Practical classes are planned to be conducted in the form of theoretical consideration modern methods of physiotherapy and practical mastering of work with modern physiotherapeutic devices with the participation of highly qualified practitioners of the department base. Acquisition of the topic (current control) is controlled by practical classes in accordance with specific objectives.

## 4. The structure of the discipline

| Topic | The number of hours | | | |
|---|---|---|---|---|
| | Total | Including | | |
| | | Lectures | Pract. classes | ISW |
| Topic 1. General physiotherapy and medical rehabilitation | 18 | 0 | 4 | 14 |
| Topic 2. Electric and electromagnetic therapy | 30 | 0 | 4 | 26 |
| Topic 3. Phototherapy | 13 | 0 | 4 | 9 |
| Topic 4. Mechanical therapy | 12 | 0 | 4 | 8 |
| Topic 5. Balneology | 17 | 0 | 4 | 13 |

## 8. Individual tasks

Not provided.

## 9. Teaching methods

**Practical classes**: talk, solution of clinical situational problems, practicing skills in basic rehabilitation techniques, an excursion to rehabilitation center.

**Independent study**: independent work with the textbook, independent solution of clinical problems.

## 10. Methods of control and criteria for evaluating learning outcomes

**Current control:** oral examination, testing, assessment of practical skills, solution of situational clinical problems, assessment of activity in the classroom.
**Final control**: test.

***The structure of the current assessment at the practical class:***

1. Assessment of theoretical knowledge on the topic of the class:
- methods: student's recitation, solution of situational clinical problem;
- maximum grade - 5, minimum grade - 3, unsatisfactory grade - 2.
2. Assessment of practical skills and manipulations on the topic of the class
- methods: assessment of the correctness of practical skills - maximum score - 5, minimum score - 3, unsatisfactory grade - 2;
3. Evaluation of work with the patient on the topic of the class:
- methods: assessment: a) communication skills with the patient and his parents, b) the correctness of the administration and evaluation of laboratory and instrumental studies, c) compliance with the algorithm of differential diagnosis d) justification of clinical diagnosis, e) treatment plan
- maximum grade - 5, minimum grade - 3, unsatisfactory grade - 2;

**Criteria for current assessment in the practical class:**

| | |
|---|---|
| **"5"** | The student is fluent in the material, takes an active part in the discussion and solution of situational clinical problems, confidently demonstrates practical skills during the examination of a sick child and interpretation of clinical, laboratory and instrumental studies, expresses his opinion on the topic, and demonstrates clinical thinking. |
| **"4"** | The student is well versed in the material, participates in the discussion and solution of situational clinical problems, demonstrates practical skills during the examination of a sick child and interpretation of clinical, laboratory and instrumental studies with some errors, expresses his opinion on the topic, and demonstrates clinical thinking. |
| **"3"** | The student does not have enough knowledge of the material, uncertainly participates in the discussion and solution of the situational clinical problem, demonstrates practical skills during the examination of a sick child and interpretation of clinical, laboratory and instrumental studies with significant errors. |
| **"2"** | The student does not have knowledge of the material, does not participate in the discussion and solution of the situational clinical problem, does not demonstrate practical skills during the examination of a sick child and the interpretation of clinical, laboratory and instrumental studies. |

**Final credit:** students who have fully completed the academic program in the discipline, do not have academic debt, their average score current performance is

3.00 or more receive a credit at the last class, which is given as "credited" / "not credited".

Conversion of traditional national assessment into multi - point (maximum 200 points) is required. If the student received a minimum grade point average of 3.00 per current performance, even in the presence of unfulfilled unsatisfactory grades, he receives a credit for the discipline.

The discipline ends with a test, only the average score is calculated of the current performance, further calculations are performed by information- computer center of the university.

## 11. Distribution of points received by students receiving higher education

The grade for the discipline consists of 50.0% of the grade for current performance and 50.0% of the grade for the exam.

**The average score for the discipline is converted into a national grade and converted into scores on a multi-point scale.**

Conversion of the traditional grade from the discipline to 200-point is performed by the information and computer center of the university program "Contingent".

A table of conversion of traditional assessment into multi-point one:

| National grade | Grade point |
|---|---|
| **“5”** | 185-200 |
| **“4”** | 151-184 |
| **“3”** | 120-150 |

Points given in the discipline are independently converted into both the ECTS scale and the four-point scale. ECTS scale scores are not converted to a four-point scale and vice versa. Further calculations are carried out by the information and computer center of the university.

Conversion of traditional assessment in the discipline and the amount of points on the ECTS scale

| Grade of ECTS | Statistic index |
|---|---|
| “A” | The best 10 % of students |
| “B” | The following 25 % of students |
| “C” | The following 30 % of students |
| “D” | The following 25 % of students |
| “E” | The last 10 % of students |

The ECTS scale is given by the ONMedU educational subdivision or the dean's office after ranking the grades in the discipline among students studying in one year and in one specialty. According to the decision of the Academic Council, the

ranking of students - citizens of foreign countries is recommended to be carried out in one array.

## 12. Questions to the final control.

1. Define the terms "physiotherapy" and "medical rehabilitation".
2. What are the main groups of physical therapeutic factors?
3. General indications for the use of physical therapeutic factors?
4. Name the basic principles of physical therapy.
5. Name the main resorts of Ukraine and their medical profile.
6. Name the periods of medical rehabilitation.
7. Name the basic principles of medical rehabilitation.
8. What is galvanization?
9. What is electrophoresis with drugs, its main types?
10. What clinical syndromes is diadynamo-, amplipulse- and interference therapy used in?
11. Explain the method of cerebral electroanalgesia, name the main apparatus.
12. Name the main types of electrical stimulation.
13. What is meant by the term percutaneous electrostimulation therapy (short-pulse therapy), what is it used for?
14. What are the indications for the use of electrosleep?
15. What is microwave therapy, what devices do you know?
16. What is meant by the term magnetic therapy?
17. What diseases is inductothermy and microwave therapy prescribed in?
18. What periods of inflammatory processes is UHF electric field effective?
19. What is meant by the term EHF therapy? The main direction of its application.
20. Give a physical definition of "light".
21. What rays are emitted in the spectrum of light?
22. Specify the wavebands long UV, middle UV and short UV.
23. What is luminescence?
24. Laser therapy: mechanism of action, therapeutic effects, indications, contraindications, methods, dosage, equipment.
25. What is the effect of low-frequency magnetic field on liquid crystal structures of the membranes and cell cytoplasm? Explain the significance of these structures of change for the cell function.
26. List the main types of low-frequency magnetic therapy, graphically depict types of magnetic fields used in them.
27. Explain the role of magnetohydrodynamic forces in changing local blood flow and cell metabolism.
28. The action of what magnetic field provides the production of heat in the tissues? Why?
29. Name the contraindications to low-frequency high-intensity magnetic therapy. Are any metal foreign bodies in the patient's tissues contraindications for procedures?
30. What are the physicochemical prerequisites for the combined use of magnetic fields and laser therapy (methods of magnetic laser therapy)?

31. Name the main types of surface application of fresh and mineral water.
32. Give the criteria for evaluating fresh drinking water.
33. What is healing mineral water?
34. Can fresh drinking water be used superficially and internally for therapeutic purposes?
35. Name the therapeutic baths and baths that are most often used.
36. How are therapeutic mineral waters divided according to the degree of mineralization?
37. The main indications for the surface application of hydrogen sulfide, carbon dioxide, radon and iodobromine waters.
38. The main indications for internal use of mineral waters.
39. Name the main factors of thermal effects on the human body (thermal and cold).
40. Define hypothermia, cryotherapy, extreme cryotherapy.
41. What is therapeutic mud? Name the main mud resorts of Ukraine.
42. The main indications and contraindications to mud treatment.
43. What is included in the concept of "climatotherapy"?
44. Name the climatic resorts of Ukraine.
45. What are the indications for climatotherapy?
46. Name the main factors of mechanical nature.
47. Give the definition of ultrasound.
48. Define ultraphonophoresis.
49. Indications and contraindications to the use of ultrasound.
50. Formulate the main indications and contraindications to the administration of natural and preformed therapeutic physical factors in children and teenagers.

## 13. Teaching and learning materials:

- The Curriculum of the discipline
- The syllabus of the discipline
- Textbooks
- Situational clinical tasks
- Guidelines of practical classes
- Test tasks by topic of the discipline.

## 14. Recommended literature

**Main literature:**

1) Physiotherapy and medical rehabilitation: a guide. In 2 volumes / V.M. Zaporozhan, I.P.Shmakova, B.B. Kentz et al. ; ed. by. V.M. Zaporozhan.- Odessa: Odessa State Med.Univ., 2010.- Vol. 1. Physical, therapeutic and prophylactic factors, devices and methods.-88 p.
2) Pshetakovsky I.L. Ways of health, quality of life and active longevity /
I.L. Pshetakovsky, I.P.Shmakova. - Odessa: Astroprint, 2013.-250 p.
3) Fundamentals of physical rehabilitation: a textbook for university students / O.K. Marchenko. - K .: Olimp. lit., 2012. - 528 p.

4) Physical rehabilitation, sports medicine: a textbook for students of higher med.institutions / V.V.Abramov, V.V.. Klapchuk, O.B. Nekhanevich et al.: ed. by Professor V.V. Abramov and associate professor O.L. Smyrnova. - Dnipropetrovsk, Zhurfond, 2014. - 456 p .: ill. 79.
5) R.L. Braddom. Physical Medicine and Rehabilitation / R.L. Braddom. - England: Elsevier Science, 2011. - 1536 p.
6) Independent physical education classes. Textbook / O.G. Yushkovskaya, T.Yu.Krutsevich, V.Yu. Seredovska, G.V.Bezverkhnya. - Odessa: Odessa. Nat. Med. un-ty. - 302 p. - (Library of medical student).
7) Sports Medicine: A textbook for students of the University of Physical education and sports / L.Ya-G. Shahlina, B.G. Kogan, T.A. Tereshchenko, V.P. Tischenko, C.M. Futorny; under ed. L.Ya-G. Shahlina. - Kiev: Scientific opinion, 2016. - 452 p .: ill.

**Additional literature:**

1) Gutenbrunner C., Tederko P., Grabljevets K., Nugraha B., Responding to the World Health Organizathson Global Disability Action Plan in Ukraine: developing Nathional Disability, Health and Rehabilitation Plan J Rehabil Med.-2018 (50), - P.338-341
2) European Physical and Rehabilitation Medicine Bodies Alliance. White Book on Physical and Rehabilitation Medicine in Europe. Eur J Phys Rehabil Med 2018. Vol.54 (2). - P.125-321.
3) A position paper on physical & rehabilitation medicine programs in post-acute settings / Ward A., Gutenbrunner S., Giustini A., Delarque A., FialkaMoser V., Kiekens S., Berteanu M., Christodoulou N. // J Rehabil Med 2012; (44): 289–298.
4) Ukrainian Journal of Physical and Rehabilitation Medicine -21-2 (04) 2019; "White Paper on Physical and Rehabilitation Medicine in Europe"
5) Physical rehabilitation of patients with coronary heart disease. Yushkovskaya O.G. A monograph / Odessa state med. University - Odessa: - 2010. - 224 p.
6) Physical rehabilitation: guidelines to practical classes for the 4th year medical students) /O.G. Yushkovskaya , N.N.Kukhar, A.L. Plakida - Odessa: "Polygraph", 2016. - 160 p.
7) DeLisa's. Physical Medicine and Rehabilitation / DeLisa"s. – Lippincott Williams & Wilkins; Fifth, North Am, 2010. - 2432 p.
8) WHO World Report on Disability [Internet]. WHO. [cited 2014 Nov 8]. Available from: http://www.who.int/disabilities/world_report/2011/en/
9) WHO global disability action plan 2014-2021 [Internet]. WHO. [cited 2014 Oct 21]. Available from: http://www.who.int/disabilities/actionplan/en/
10) World Health Organization. Rehabilitation 2030: a call for action: Meeting report [Internet]. WHO; 2017. Available from: http://www.who.int/disabilities/care/rehab-2030/en/

## 15. Information resources:

1. https://www.moz.gov.ua/mkf
2. https://www.msp.gov.ua/files/5.pdf
3. http://utfrm.com.ua/news_275/

4. https://www.president.gov.ua/documents/6782015-19605
5. https://zakon.rada.gov.ua/laws/show/2961-15