MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE
V. N. Karazin Kharkiv national university

# FUNCTIONING FEATURES OF THE ROOM FOR MEDICAL PROCEDURES IN THE THERAPEUTIC DEPARTMENT AND RESPONSIBILITIES OF THE NURSE FOR ITS PROVIDING. FUNDAMENTAL RULES OF INHALERS ADMINISTRATION. METHODS AND TECHNIQUES OF OXYGEN ADMINISTRATION AND USING OF OXYGEN CUSHION. REVIEW OF PHYSIOTHERAPEUTIC PROCEDURES (HYDROTHERAPY, PHOTOTHERAPY, ELECTROMAGNETIC THERAPY)

Methodological recommendations
for independent preparation for practical classes
for the 3rd year higher medical education applicants
in the discipline «Nursing practice. The main duties and professional activities of medical nurse in therapeutic department»

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F97 Functioning features of the room for medical procedures in the therapeutic department and responsibilities of the nurse for its providing. Fundamental rules of inhalers administration. Methods and techniques of oxygen administration and using of oxygen cushion. Review of physiotherapeutic procedures (hydrotherapy, phototherapy, electromagnetic therapy) : methodological recommendations for independent preparation for practical classes for the 3rd year higher medical education applicants in the discipline «Nursing practice. The main duties and professional activities of medical nurse in therapeutic department» : translation from Ukrainian language / edited by : Mariia S. Brynza, Ella V. Karnaukh, Olena S. Makharynska and others. – Kharkiv : V. N. Karazin KhNU, 2020. – 39 p. : website : http://medicine.karazin.ua/en/kafedri/kafedra-propedevtiki-vnutrishnoi-meditsini-i-fizichnoi-reabilitatsii-/navchalno-metodichni-materiali-dlya-studentiv

The methodological recommendations were developed by the team of teachers of the Department of internal medicine propaedeutic and physical rehabilitation of V. N. Karazin Kharkiv national university of the School of medicine. An indicative map of the applicants work for higher medical education is provided, with clear, consistent and detailed recommendations for preparation at each stage of the practical training. The list of basic theoretical questions and practical skills, structure and content of topics, test modules for the initial and final level of knowledge control are given, the basic and additional literature is specified, there are references to the electronic resources of department's educational materials in the annexes.

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## ESTIMATED MAP OF WORK FOR HIGHER MEDICAL EDUCATION APPLICANTS FOR PRACTICAL CLASSES PREPARATION

| **Preparatory phase:** | |
|---|---|
| 1. | To know **the interdisciplinary integration** of practical classes topic with the acquired theoretical knowledge and practical skills in basic disciplines (medical biology, medical and biological physics, Latin language, human anatomy, normal and pathological physiology, biological and bioorganic chemistry, pathological anatomy, microbiology, virology and immunology, pharmacology etc.). Acknowledge the terminology (including Latin transcription). |
| 2. | **Motivational characteristic** and **substantiation of the topic** of the practical lesson **on behalf of the formation of clinical thinking,** in particular for the further development of skills to apply knowledge and certain practical skills established on the basis of the educational-qualification characteristic (EQC) and the educational-professional training (EPT) of the medical specialty. |
| 3. | To give better insights into the types of student's educational activity, information provided on the reference stands of the department: **thematic-calendar plans of lectures**, **practical classes and extra-curriculum independent work of students (ISW)**, corresponding to the curriculum and to the working program in discipline «**Nursing practice. The main duties and professional activities of medical nurse in therapeutic department**». |
| 4. | Utilization of the basic and additional **educational and methodical literature**:<br>● **textbooks** and **tutorials** (printed and electronic versions) which are listed in these guidance after the theoretical section;<br>● **educational and methodological materials of the department** (methodological recommendations for student's preparation for practical classes and for independent student's work); |

| |
|---|
| ● attendance of **lectures** (on-site supply of the educational process using multi-media presentations during lectures) – according to the thematic plan.<br>Usage of **printed publications** for classes preparation, they can be obtained from the library, and / or **electronic versions of it**, that available on the official website of the V. N. Karazin KhNU http://www.univer.kharkov.ua/ua/departments (Section navigation: ... / Schools / Departments / Propaedeutics of internal medicine and physical rehabilitation ) – ref. Annex 1;<br>and in the open interactive database of the electronic archive of the V. N. Karazin KhNU Repository http://ekhnuir.univer.kharkov.ua (navigation: School of medicine / Educational editions) – ref. Annex 2.<br>It is advisable to note the main issues in the form of summaries. |
| **Main phase:**<br>Practical classes duration is 4 academic hours, they are held at **the clinical base of the department** — Specialized medical and sanitary department № 13 (Kharkiv, Kyivsky district, Academika Kurchatova avenue, 29) – future V. N. Karazin KhNU Clinic – ref. Annex 3.<br>**NOTE!** It is forbidden to attend department classes without a medical uniform, replaceable shoes, medical cap, mask, shoe covers, stethofonendoscope. |
| 1. To achieve the educational goal of practical classes and mastering the theoretical part of the subject it is necessary to **LEARN** and **ASKKNOWLEDGE** the answers **to the main theoretical questions** of the lesson's topic (ref. the list of the main theoretical questions) that will be checked by the teacher through an oral and/or written survey (correction, refinement, additional answers) during the main phase of the practical classes conduction. |
| 2. **TO BE ABLE TO** solve theoretical, multiple choice test with explanation (to control the initial and final levels of knowledge), situational tasks proposed for mastering of the topic. |

| | |
|---|---|
| 3. | **TO MASTER PRACTICAL SKILLS** on the topic:<br>● To take an active part in the demonstration by a teacher of skills: conducting, questioning, reviewing the patient and rules for determining the main indicators of the cardiovascular and respiratory systems (pulse, blood pressure, respiration) and providing first aid to patients with violations of these systems.<br>● Make a preliminary assessment of the patient's temperature homeostasis as a result of determining the body temperature and registering the temperature curves, demonstrating the skills of caring for patients with fever.<br>● Demonstrate skills in personal hygiene and care for patients who are seriously ill.<br>● Demonstrate ownership of the basic methods of intensive care.<br>● To know and fulfill the basic duties of junior medical personnel at all stages of the patient's stay in the departments and units of the therapeutic hospital (polyclinic, reception, in-patient department, transportation and sanitary-hygienic mode of stay in specialized departments, basic rules for nursing practice and implementation of medical appointments (medical, physiotherapeutic, perform the necessary medical manipulations, etc.), especially the cleaning of the premises of the therapeutic department, the filling of the medical documentation, etc.). |
| 4. | **EXECUTE** obligatory tasks foreseen for student's independent work. |
| | **Final phase:** |
| 1. | On the basis of mastering of theoretical knowledge and practical skills from the subject of practical training, to introduce the basic principles of nursing practice of adult age in the conditions of a general-therapy permanent establishment in the process of further training and professional activity. |
| 2. | During practice, fill out a diary of practice. |

## The purpose and main tasks of the work

The goal is to achieve the main endpoints defined in the Master's Degree Program (MDP) (second level of high education), Discipline 22 «Health care» Specialty 222 «Medicine» which was established on the basis of educational qualification characteristics (EQC) and educational-professional training (EPT) of a medical specialty «**Nursing (practice). The structure and main tasks of care of patients in the general system of treatment of patients of therapeutic profile»**, which is made on the basis of the program for the nursing practice of therapeutic profile for higher medical institutions of education of Ukraine III-IV accreditation levels.

**Main tasks:**

1. Acquiring and improving the professional skills of a nurse.
2. Fixing in practice theoretical knowledge of basic disciplines.
3. Deepening and systematization of knowledge and skills in the nursing practice in accordance with the principles of medical ethics and deontology.

As a result of studying the discipline the 3rd year higher medical education applicants must:

**TO KNOW:** moral and deontological principles of a medical professional and principles of professional subordination in the therapeutic clinic.

**TO BE ABLE:** to organize the regime and nursing work with various therapeutic diseases, to perform necessary medical manipulations.

## SELF-WORK of the 3rd year higher medical education applicants on the topic of the practical lesson:

- Transmission training for practical classes.
- Realization of practical skills of nursing manipulations.
- Work in in-patient departments as a nurse.
- Individual work.

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## MAIN QUESTIONS

**As a result of studying the 3rd year higher medical education applicants <u>must KNOW</u> (the main theoretical questions):**

1. Methods and technique of humidified oxygen supply and features of oxygen cushion use.
2. Methods of using a pocket and stationary inhaler.
3. The mechanism of effect of physical factors during the provision of physiotherapeutic procedures − hydrotherapeutic, phototherapeutic, electromagnetic.
4. Necessary skills in observing patients and providing first aid in case of health deterioration during provision of physiotherapeutic procedures.

**<u>must BE ABLE</u> (basic practical skills on the topic of the practical lesson):**

1. The supply of humidified oxygen to the patient.
2. Use of oxygen cushion.
3. Use of a pocket and stationary inhaler.
4. Provision of physiotherapeutic procedures and features of their conduct.
5. Provision of first aid in case of health worsening during provision of physiotherapeutic procedures.

## Test to control the INITIAL LEVEL OF KNOWLEDGE

1. The most effective method of oxygen therapy:
   A. Oxygen supply through the oxygen cushion.
   B. Oxygen supply through the nasal catheters.
   C. Oxygen supply through the mask.
   D. Oxygen supply through the apparatus of artificial ventilation (lung ventilation).
   E. Hyperbaric oxygenation, or oxygenobaric therapy.

2. Bobrov's device used:
   A. To purify oxygen from impurities.
   B. To humidify the oxygen.
   C. To create the necessary pressure.
   D. For mixing oxygen with nitrogen.
   E. For a clear percentage of oxygen and carbon dioxide.

3. The oxygen cushion is:
   A. A rubberbag with a volume from 10 to 75 liters, equipped with a rubber tube with a tap and a mouthpiece.
   B. A kevlar bag with a volume from 10 to 75 liters, equipped with a rubber tube with a mouthpiece.
   C. A paper bag with a volume from 10 to 75 liters, equipped with a tap and a mouthpiece.
   D. A fabric bag with a volume from 10 to 75 liters, equipped with a rubber tube and a crane.
   E. A plastic bag with a volume from 10 to 75 liters, equipped with a rubber tube with a tap and a mouthpiece.

4. It is neccessary while using the oxygen cushion to:

A. Tell the patient tat he should inhale and exhale through the nose.

B. Tell the patient that he should breathe through the mouth and exhale through the nose.

C. Explain to the patient that he should breathe in and out through the mouth.

D. Explain to the patient that he should breathe through the nose and exhale through the mouth.

E. All mentioned above.

5. To supply the oxygen-air mixture through the nasal catheters should be used:

A. Medical Oxygen Balloon

B. Sterile nasal catheters

C. Sterile vaseline

D. Rubber or plastic tube, bandaids

E. All mentioned above.

Standarts of answers: 1 – E, 2 – B, 3 – A, 4 – B, 5 – E.

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## STRUCTURE AND CONTENT OF THE TOPIC

**Topic relevance.** The organization of work and clear performance of duties by the nurse are an integral part of the treatment process, contribute to improvement of the patient's condition and ensure the success of the treatment. Nursing staff together with the doctor share a place near the patient’s bed in the struggle for his life and health.

PART 1

# FUNCTIONING FEATURES OF THE ROOM FOR MEDICAL PROCEDURES IN THE THERAPEUTIC DEPARTMENT AND RESPONSIBILITIES OF THE NURSE FOR ITS PROVIDING

## The room for medical procedures: tasks, functions, equipment

The room for medical procedures is a place for performing various medical and diagnostic procedures. Initially, it was created at hospitals and clinics to protect patients from nosocomial infection, to which the latter are most prone during invasive manipulations (blood collection, injection, treatment). Then, the room for medical procedures became a mandatory part of almost any medical institution.

The room may have features depending on which hospital it belongs to: hospital, medical center or polyclinic, surgical department or therapeutic one.

But still there are general principles of the organization and work of the rooms for medical procedures. The manipulations performed in the room for medical procedures are all kinds of injections and infusions (intravenous, intramuscular, subcutaneous, vaccinations), the latter are performed in the room only for walking patients or patients with reclining and normal mode. Also in the room wound treatment, various dressings, removal of sutures and plasters can be performed. Diagnostic procedures performed in the room for medical procedures include blood sampling for biochemical blood analysis, blood sampling for HIV, hepatitis, hormones, antibody titers, etc.

In addition, the room for medical procedures serves as a place for pre-medical care, including an emergency one, performed by a qualified nurse in this regard.

The quality of the room for medical procedures requires the availability of special equipment and tools, namely:

1) a bactericidal lamp – is used for decontamination and destruction of bacteria, viruses and other microorganisms;

2) a tonometer – is used to measure blood pressure;

3) a phonendoscope – is used for listening to the heart and lungs;

4) a hand towel;

5) a glove towel;

6) a hanger for the patient's gown;

7) a hanger for the nurse's robe;

8) a hand wash (preferably with an elbow valve);

9) a basin for washing instruments after disinfection and pre-sterilization cleaning;

The procedural nurse's workplace is equipped with:

1) a sterile table;

2) a desk for injection preparation;

3) one or two manipulation tables;

4) one or two couches;

5) a set of venous plaits;

6) a set of glutinous cushions;

7) alocker with injection solutions;

8) there are special arrangements for provision of first aid in the room: cardiovascular failure, convulsive syndrome, anaphylactic shock, hyperthermic syndrome.

9) a sufficient number of syringes;

10) biks with dressing material;

11) containers with disinfectants for syringes, needles, dressings, gloves, rags.

12) a container of dark glass with a ground stopper with alcohol 70%;

13) an adhesive plaster;

14) a stable tripod for drip administration of medicines.

**Requirements for procedural nurse, her responsibilities and functions**

Persons who have a basic level of secondary medical education in the specialty "Nursing" are admitted to the position of a nurse of the room for medical procedures.

The procedural nurse is admitted and dismissed by the chief medical officer of the hospital upon submission of the head of the department and in agreement with the chief nurse of the hospital.

Junior nursing staff of the department is directly subordinated to the procedural nurse.

The procedural nurse is directly subordinated to the senior nurse.

The procedural nurse works according to a schedule compiled by the senior nurse of the department, approved by the head of the department.

In her work, the procedural nurse is guided by the job instruction, orders, and instructions for organization of the room.

The nurse must perform the following job responsibilities:

1) prepare the room for admission of patients;

2) provide the room with a sufficient number of medicines, disinfectants;

3) perform intravenous injections and infusions, intramuscular injections, subcutaneous injections, blood sampling from a vein for study;

4) prepare working solutions of disinfectants;

5) disinfect surfaces in the room for medical procedures;

6) disinfect the material used in the room for medical procedures;

7) conduct quartzing, ventilation of the room;

8) conduct and control the timeliness and quality of the general cleaning of the room;

9) collect and prepare medical waste formed in the room for medical procedures for the disposal.

*At the direction of the doctor and under his/her supervision:*

1) to ensure timely provision of assigned manipulations;

2) to provide necessary medical care within the competence;

3) to follow the rules of storage of medicines and their expiry date;

4) to maintain the established medical records;

5) to keep records of medicines that are on the subject-quantitative account, to report to the senior nurse;

6) to always have sufficient medicines, soft material, emergency kits for emergency care and HIV/AIDS prevention in the room for medical procedures;

7) to be responsible for the preservation and integrity of the sanitary and economic property of the room for medical procedures;

8) to consume electricity, heat, water economically;

9) to improve their professional level and qualification systematically;

10) to work on the promotion of healthy lifestyles and prevention of diseases among patients;

11) to work on the approved schedule, getting acquainted with it monthly under signature;

12) to inform about the violations in the work of the senior nurse in due time;

13) to follow the safety regulations and rules of fire safety.

The procedural nurse should strictly follow the doctor's instructions, strictly adhere to the technics, sequence and timing of the manipulations and procedures, dosing; be aware of the drug action duration.

The mark on the performance of the prescription is made by the first letter of the nurse’s name in the list of medical prescription, or by the signature.

In the absence of the required medication or refusal of the patient for treatment, the procedural nurse is obliged to report to the doctor on duty, the therapist or the senior nurse of the department.

Nurses are strictly forbidden to independently abolish or replace the missing medicines.

**Procedural nurse hygiene and requirements for her appearance**

The procedural nurse should be a model of cleanliness and accuracy. She should constantly monitor the cleanliness of the body, at least once a week, and with excessive sweating − more often take a hygienic bath, carefully watch her hands and wash them before eating and after visiting the toilet, before and after each medical manipulation.

The nails should be cut shortly and not varnished. In the presence of dry skin after washing hands should be greased with hand cream or any oil.

The cleanliness of the clothes is very important, taking into account the dress-code. When the nurse comes to work, she changes into a clean, ironed robe. Before entering the room for medical procedures, she wears a hat and mask.

The hair is neatly gathered under a hat. Makeup should be moderate, modest jewelry. A neat, fit nurse inspires trust in the patient, and in her presence, he feels calmer and more confident.

For the prevention of nosocomial infection, the nurse is obliged to:

1) separately store outerwear and overalls,

2) not to go in overalls outside the hospital,

3) do not wear overalls during off-duty hours.

*Safety requirements for the nurse in the room for medical procedures*

1) Turn off the bactericidal lamps in the room for medical procedures.

2) Check the state of sanitary and hygienic clothing, the integrity of gloves, masks. Put on sanitary and hygienic clothing.

3) All manipulations that may cause contamination of the hands and mucous membranes with blood or serum should be carried out in rubber gloves. If there is a risk of splashing of blood or serum, work in masks and goggles.

4) There should be no jewelry (rings, bracelets) on the hands of procedural sisters.

The nails should be cut short. All damaged areas of the hands should be covered with a patch or fingerstalls.

5) Prepare a workplace, check the availability of detergents, sterile tools, specifying the period of its sterilization, the presence of trays for sterile materials, disinfected dishes – for used tools and materials.

6) Before performing injections, the nurse must:

- specify notes in the journal of prescriptions;
- wash hands thoroughly;
- read the inscriptions on the vials carefully;
- check the expiration date of the medicines.

7) When preparing materials for washing, disinfection and sterilization, the requirements of the sanitary regime should be followed.

*Safety requirements during the procedural nurse's work*

- To prevent HIV the nurse changes sterile cotton balls and tweezers every 2 hours.
- To carry out medical manipulations wadded balls should be taken with sterile forceps.
- To keep the tweezers in a sterile container (tray) between the manipulations.
- To keep the sterilization box (biks) in closed form when performing the manipulations.
- During the 24-hour work of the room for medical procedures 4 sterilization boxes (bikses) are required.
- To carry out medical procedures a new pair of gloves should be used for each patient.
- After removal of gloves it is necessary to carry out hygienic cleaning of hands.

When working in the room for medical procedures it is forbidden:

1) to work with a defective tool, use defective equipment;

2) to be indoors with the inclusion of non-shielded bactericidal lamps;

3) to store and use drugs in damaged packaging, without labels, overdue medicines;

4) to leave unattended electrical equipment;

5) to work without established sanitary and hygienic clothing and other personal protective equipment;

6) to store food in the refrigerator for medicines;

7) to store personal items, clothing in the workplace;

8) to use cosmetics, smoke, eat at work.

**Cleaning of the room for medical procedures, its disinfection and sterilization**

Work in the room for medical procedures starts with current cleaning. The routine cleaning of the room for medical procedures is carried out at least 2 times a day, more often if necessary: in the morning before the start of the day and at the end of the work shift. Wet cleaning should always be combined with disinfection and bactericidal irradiation. For disinfection use a 1% solution of chloramine or other desinfective solution.

UV irradiation and ventilation is carried out 4 times a day for 15-20 minutes (after collection and in the process of irradiation with UV stationary mobile lamps at the rate of 1 W of power per 1 $m^3$ of the room).

A nurse or cleaner puts on a bathrobe and gloves. In a special container pours a solution and a clean cloth is laid for surface treatment. All surfaces are wiped in a strict sequence −the table for sterile material, cupboards for sterile solutions, equipment, manipulation tables, chairs, couches for patients, walls at arm's length (1.5m) from window to door.

For cleaning specially dedicated cleaning equipment is used, it has a clear marking with the indication of the premises, type of harvesting works and a specially allocated storage place.

After use, the cleaning equipment is disinfected.

When carrying out general cleaning, sterile rags are prepared, the premises are freed as much as possible from tools, beaks, medicines and furniture, or the latter are removed from the walls, etc. Staff wears clean sanitary clothing (bathrobes, hats), rubber gloves and a gauze mask (when working with chloramine solutions – a respirator).

Disinfectant solution (6% hydrogen peroxide solution with the addition of 0.5%; 5% chloramine solution) is applied to the walls by irrigation or wiping them to a height of at least two meters, windows, windowsills, doors, furniture and equipment. After the time of disinfection (the staff must change clothes) all surfaces are washed with clean cloths soaked in tap (drinking) water and then disinfected indoors.

Procedural nurse safety is performed in accordance with rules that minimize the possibility of iatrogenic infection during operation. All manipulations which may cause contamination of the hands with blood or serum should be carried out in rubber gloves. During work all injuries on the hands must be closed with fingerstalls, adhesive plasters. If there is a risk of splashing of blood or serum, the nurse should work in mask. It is forbidden for medical staff to carry out parenteral procedures using medical equipment intended for patients, eat and smoke in laboratories and rooms where procedures with patients are carried out.

The main documentation of the room for medical procedures:

- air autoclave journal;
- journal of the work of the oven;
- quartz journal;
- journal of planned medical prescriptions account;
- journal of biochemical analyzes;
- journal of accounting and expenditures of medicines;
- journal of investigations of HIV and hepatitis patients;
- journal of emergency situations and injury of healthcare professionals;

- notebook for general cleaning;
- journal of pre-sterilization processing.

PART 2

## FUNDAMENTAL RULES OF INHALERS ADMINISTRATION

### Rules for using a pocket inhaler: algorithm and technique of application

Rules for the use of a pocket inhaler are required for the most effective use of dosed medicines in chronic respiratory diseases (most often in bronchial asthma). Pocket inhalation drugs are intended for patients with chronic respiratory diseases, at risk of sudden spasm of the airways and forced to use high-speed aerosol bronchodilators.

1. The algorithm for the use of a pocket inhaler

As a dose inhaler is an agent of first-aid, the required dose of the drug which enters the respiratory tract and will have a bronchodilatory effect depends on the technique of its use.

*The algorithm for using the inhaler:*

1) shake the inhaler;
2) remove the protective cap;
3) exhale deeply;
4) insert the mouthpiece into your mouth;
5) starting to inhale push the can;
6) after making sure that the medicinal substance has entered the mouth continue to take a slow deep breath;
7) hold your breath;
8) taking out the can exhale through the nose;
9) close the inhaler with a mouthpiece.

A compulsory requirement for inhalation techniques is to inhale at the same time as you press the can, otherwise much of the aerosol will dissipate in the air bypassing the airways.

As practice shows, errors in the use of inhalation devices are made by more than half of patients of which the majority of errors are noted in persons over 50 years.

2. Auxiliary devices for inhalation

To facilitate the use of the inhaler there are spacers − special nozzles in the form of a reservoir for aerosol substance. With their help it is possible to carry out inhalations even to small children (in this case the face mask is put on a mouthpiece).

When a person is unable to use an inhaler due to childhood or old age, severe condition or brain function, it is advisable to use nebulizers − electrical inhalers. Their feature is the spray of the medical solution under pressure and its delivery to the farthest parts of the respiratory tract, which is indispensable for severe exacerbations of the disease, when it is impossible to take a deep breath and hold your breath. Depending on the method of spraying, there are several types of nebulizers:

• compressor;

• ultrasound;

• membrane.

Patients are usually advised to buy compressor nebulizers because they are durable in use and do not cause the destruction of inhalation drugs.

*Symptoms of overdose by inhalation*

Misuse of pocket inhalers in some cases threatens the overdose of the drug. More than 10 breaths a day can lead to toxic effects on the cardiovascular system: the pulse is accelerated, there is a small tremor in the hands, shortness of breath is a consequence of impaired heart function, and further attempts to get rid of them by repeated intake of bronchodilating agents only worsen the patient's condition; in severe cases, complications such as arrhythmia or heart attack may occur.

## PART 3
## METHODS AND TECHNIQUES OF OXYGEN ADMINISTRATION AND USING OF OXYGEN CUSHION

Oxygen therapy is used to eliminate or reduce arterial hypoxemia. This is a very effective way to increase the oxygen content in the patient’s blood. Oxygen is prescribed in cases of insufficient oxygen supply to organs and tissues arising from various diseases of the respiratory system, circulatory organs, poisoning, shock, pulmonary edema, after complex surgical interventions.

The duration of oxygen therapy ranges from several hours to several days, depending on the patient's condition. Oxygen given to a sick child must be humidified, and its constant concentration in the air inhaled by the patient is 24-44%. The supply of humidified oxygen is carried out by various means.

Goal. Elimination of oxygen starvation by tissues. Medical oxygen is a gas consisting of a mixture of 95% oxygen and 5% carbon dioxide in a cylinder at a pressure of 150 Atm.

Indication. Emergency conditions accompanied by various respiratory disorders, diseases of the cardiovascular system; damage of the chest; chronic diseases of the bronchi, lungs; intoxication by carbon monoxide, hydrocyanic acid, suffocating substances.

Equipment. Oxygen balloon of blue color with reducer that decreases oxygen pressure; oxygen cushion checked for integrity and equipped with a funnel and clamp; a four-layer gauze cloth moistened with water and pressed; Bobrov's apparatus; sterile nasal cannula; adhesive plaster.

***Technique for performing humidified oxygen inhalation***

There are two ways to supply humidified oxygen for inhalation.

Flow of oxygen from the cushion.

1. Fill the cushion with oxygen from the balloon when the external pressure gauge 2 - 3 atm.

2. Put a clamp on the tube of the cushion, put on the funnel.

3. The funnel is treated with 70% alcohol 2 times at 15 min intervals.

4. Wrap the funnel with a damp gauze cloth.

5. Put the cushion funnel to the patient's mouth at a distance of 4 - 5 cm or press it against his mouth.

6. The patient is advised to breathe calmly, trying to breathe through the mouth and exhale through the nose.

7. When the patient's inhaling, open the clamp on the tube oxygen cushion, and when exhaling, close, so that there is no oxygen leak into the environment.

8. Continue to give oxygen until the gas pressure in the cushion is greater than atmospheric one.

9. As oxygen is released from the cushion, the clamp is completely removed and oxygen is supplied, the cushion rolls down from the angle opposite to the pipe until it contains oxygen.

Supply oxygen through the nasal oxygen cannula

1. The nasal cannula is introduced into the nasal passages.

2. Fix the cannula near the patient's head.

3. Connect the cannula tube to that of the Bobrov's apparatus above the water.

4. Open the valve of the reducer of the oxygen cylinder connected to the Bobrov apparatus, regulate the speed of oxygen supply to 4 - 5 l/min.

Notes. When oxygen from the balloon reaches the cushion, the following safety rules must be observed:

- it is inadmissible to smoke, use open flames or electrical appliances near the oxygen baloon;

- it is forbidden to use ether, alcohol, technical oils, gasoline near oxygen installations because of the flammability of oxygen in contact with these substances;

- you must not direct the flow of oxygen into the face, eyes, since compressed oxygen is a dry cold gas that can cause burns.

Supply of humidified oxygen through the face mask

One way to deliver oxygen is to use an oxygen cushion.

| | |
|---|---|
| | Oxygen cushion is a quadrangular rubberized bag, connected by a rubber tube to a faucet and a mouthpiece or funnel. A cushion containing up to 10 liters of oxygen is filled at a pharmacy or centrally at an oxygen station. Before using oxygen, the mouthpiece is wrapped with 2-3 layers of gauze soaked in water. Then it is put to the patient's mouth and the crane is opened to regulate oxygen supply. |

When the volume of the oxygen is significantly reduced, it is squeezed out with your free hand. Before use, the mouthpiece is treated with disinfectant solution, boiled or rubbed with alcohol.

The use of oxygen and oxygen cushion is possible only on prescription. Oxygen overdose is as dangerous as its insufficient amount. Particularly severe complications of oxygen overdose develop in young children.

## PART 4
## FAMILIARIZATION WITH CONDUCTION OF PHYSIOTHERAPEUTIC PROCEDURES (HYDROTHERAPEUTIC, LIGHT, ELECTROMAGNETIC)

***Phototherapy*** is a method of physiotherapy that consists of a dosage effect on the patient's body of infrared (IR), visible and ultraviolet (UV) radiation. There are seven primary colors in the visible light spectrum: red, orange, yellow, green, blue, blue, purple. The biological action of light radiation depends on the depth of its penetration into the tissue. The longer the wavelength is, the greater the effect of radiation is. IR rays penetrate the tissues

to the depth of 2-3 cm, visible light − up to 1 cm, UV rays − by 0.5-1 mm. V. M. Bekhterev justified the treatment with light of a number of neuropsychiatric diseases. He attributed the anesthetic effect to white color, sedative effect −to blue one, irritative effect − to red color. He recommended that patients in a state of mental excitement were placed in wards with blue light, and patients with mental depression − in wards with pink walls. It is now established that red and orange colors stimulate cortical activity, green and yellow balance the processes of excitation and inhibition, blue color inhibits neuropsychiatric activity. Recently, the method of jaundice treatment in newborn and preterm infants by the blue color has become widespread, as bilirubin which causes jaundice decomposes under its influence. Infrared irradiation (IR) − electromagnetic radiation invisible to the naked eye, directly adjacent to the red region of the visible spectrum. Infrared rays penetrate into the tissues of the body deeper than other types of light energy − up to 2 - 3 cm that causes the warmth of the entire thickness of the skin and partially subcutaneous tissues. Deeper structures are not subjected to direct warming. Violation of the rules of infrared irradiation can lead to dangerous overheating of tissues and the occurrence of thermal burns of the I and even II degree, as well as congestion of blood, dangerous cardiovascular diseases.

Therapeutic effects of infrared radiation: increased local microcirculation, pronounced anti-inflammatory effect, increased tissue regeneration, local resistance. The generalized effect of infrared radiation is manifested by an antiseptic effect, in particular on the abdominal organs, which is accompanied by a decrease in pain, especially in chronic inflammatory processes. When exposed to infrared rays on human tissues, phenomena of reflection, refraction and absorption are observed. IR absorption causes heat accumulation. This is manifested by the enlargement of the vessels of the internal organs and an increase in their metabolism, as well as an increase in respiration and activation of the thermoregulatory centers of the hypothalamus. Vascular and tissue

permeability increases, so does phagocytic activity and migration of leukocytes, the proliferation and differentiation of fibroblasts which contributes to the resorption of infiltrates and tissue dehydration. Under the influence of infrared rays tactile sensitivity is increased and pain decreases, spasm of smooth muscles of the internal organs is reduced.

Indication. The main therapeutic effects of infrared rays are anti-inflammatory, metabolic, local anesthetic and vasoactive, which allows them to be used in non-purulent chronic and subacute inflammatory local processes, including those in internal organs; in burns and frostbite, wounds and ulcers, various adhesions, myositis, neuralgia, consequences of injuries of the musculoskeletal system.

Infrared radiation is contraindicated in malignant neoplasms, bleeding tendencies, acute purulent-inflammatory diseases.

***Hydrotherapy*** − the use of fresh water for therapeutic and prophylactic purposes. In a broad sense, the term "healing" includes the use of mineral water, called balneotherapy, for therapeutic and prophylactic purposes.

*Physical and physiological base of water treatment.*

Water treatment procedures have a complex and diverse effect on the body, with an important role played by the physico-chemical properties of water: high thermal conductivity, high heat capacity, low viscosity, high dielectric constant. The main acting factors in water treatment are temperature, mechanical and chemical factors. The basis of the action of hydrotherapeutic procedures is a combination of different temperature and mechanical stimuli. In balneotherapy procedures, a chemical factor is added to the temperature and mechanical stimuli. The temperature factor affects the body in all types of water treatment. Depending on the water temperature, there are different healing treatments: cold, if the water temperature is below 20 ° C; cool − from 21 to 32 ° C; indifferent − from 33 to 36 ° C; warm − from 37 to 38 ° C; hot − from 39 ° C

and over. Most often for therapeutic purposes water of indifferent or close to it temperature is used. By indifference it is meant water temperature, which is not significantly different from the internal temperature of the body and causes minimal skin irritation. The action of the temperature factor is based on the fact that heat energy is exchanged between the human body and water. The main site of action of healing properties is the skin, its vascular system and receptors (thermoreceptors). By physiological properties, thermoreceptors are usually divided into the following main types: cold, mechanoreceptors and thermal. Irritation of the thermoreceptors provides a response to the healing process not only of the CNS, but also of other organs and body systems. Water treatment with water temperature close to the so-called indifferent has a sedative effect, causes a feeling of drowsiness. Cold treatment that irritates cold receptors has a similar effect. Prolonged use of procedures with both cold and hot water is accompanied by CNS suppression. In the formation of reactions to the thermal factors, thermoreceptors of the internal organs, spinal, medulla and midbrain are involved along with the skin thermoreceptors. In response to the action of temperature stimuli, skin-visceral reflexes are activated; first of all they change blood circulation, breathing, sweating. Hemodynamic shifts are accompanied by redistribution of blood, changes in heat exchange and metabolism. Cold treatment slows down and intensifies, while hot treatment increases and weakens heart rate. The former increases blood pressure, the latter has a hypotensive effect. Cold healing treatments ultimately lead to deep and slow breathing. Warm and hot procedures increase breathing and reduce its depth. Cold water treatments cause increase in skeletal and smooth muscle tone. Warm water treatments help to reduce muscle tone, have a relaxing effect on the smooth muscles of intestine. Temperature-dependent shifts during water treatment are observed in other systems of the body. It is worth mentioning the natural relationship between the reaction of blood vessels and internal organs in hydrotherapy. In general water thermal procedures, the vessels of the internal

organs react opposite to the vessels of the skin, that is, at the time when the vessels of the skin narrow, the vessels of the internal organs expand, and vice versa (Nikitin - Dastra Marat law). An exception is the vessels of the kidneys and brain, which react independently of the vessels of the skin. At local area-limited thermal stimuli, vessels of the same diameter react unidirectionally with vessels of skin of the same diameter. It is also important to remember that hydrotherapy treatments should end with active hyperemia, regardless of whether a warm or cold irritation is applied. In all water treatment procedures, a mechanical factor (water pressure, movement) acts simultaneously with the temperature stimulus, but its value depends on the type of procedure.

Special techniques (technologies) can be used to enhance or change the mechanical irritation in hydrotherapy. The mechanical factor, joining the temperature, enhances the overall effect of the procedure, causing overwhelming changes in the circulatory system and breathing. According to the law of Archimedes, when immersed in fresh water, a person "loses" about 9/10 of body weight, which significantly facilitates movement with weakened muscle strength. This is used in medical practice to conduct therapeutic gymnastics in the pool. The chemical action of fresh water is very weak. Therefore, in order to enhance it and increase the effectiveness of water treatment during the procedures (mainly baths), various chemical ingredients (medicines, aromatic substances, infusions or boils, etc.) are added to the water. Treatment procedures are quite numerous and differ not only in terms of temperature and mechanical irritation, but also in the amount of exposure, the complexity of the presence of additional factors. Water treatment procedures include: wiping, pouring, wrapping, various showers and baths, irrigation, intestinal washes. Water treatment procedures are dosed individually, taking into account both the nature and parameters of the stimulus and the state of reactivity of the patient's body. During the course of hydrotherapy, the duration of the reaction (especially cardiovascular system) of the patient should be taken into account. With a weak

and rapid reaction, the procedure can be prescribed daily, with stronger one − a day or two after, resting on the third. The duration of the healing treatments usually does not exceed 15-20 minutes, but may be shorter (for example, in intensive showers). Hydrotherapy is prescribed as a course from 8-10 to 16-20 procedures. For the purposes of prevention and quenching, water treatments start with small dosages that have a weak irritant effect and gradually increase them, training adaptation mechanisms and increasing the body's resistance to environmental conditions.

General indications. Cold water treatments have been shown as a tonic that stimulates functions of the nervous and cardiovascular systems, increases the metabolism in the body. Procedures with warm water are prescribed for chronic inflammatory diseases, especially musculoskeletal disorders, disorders of certain types of metabolism (water-salt, fat, etc.). Hot water procedures are used as a stimulator for perspiration as well as for metabolic processes. Procedures with water of an indifferent temperature act sedatively with the increased irritability of the nervous system, prescribed for diseases of the cardiovascular system, insomnia, etc.

General contraindications: pronounced atherosclerosis; arterial hypertension of III degree, disturbances of cerebral and coronary circulation; decompensation of cardiac activity; benign and malignant neoplasms; tuberculosis in the active phase; bleeding and predisposition to them; diseases of the blood system and blood-forming organs; infectious diseases and parasitic skin diseases.

***Magnetotherapy*** − the influence of a permanent or variable low-frequency magnetic field (respectively PMF or LMF), in continuous or intermittent modes. Physical characteristics (biometric parameters): MF intensity in mT, gradient in mTkm, vector, frequency, impulse shape, duration of exposure. Physical and physiological effect of magnetotherapy − driving electromotive force; influence

on the course of a number of free radical chemical reactions in biological systems and processes of lipid peroxidation in membranes; change in the probability of electronic transitions affecting the rate of chemical reactions (taking into account the systems of iron ions, copper, manganese).

Cellular and non-cellular components of blood, its coagulation and vascular endothelium (prostaglandin synthesis), alteration of redox processes, restructuring of the neuro-endocrine system, activation of endocrine glands-targets (ejection of hormones), metabolic reactions, increase in autobody level, changes in rheological properties of blood, improvement of microcirculation.

Therapeutic action − anti-inflammatory, anti-edematic, analgesic, reparative, antihypertensive.

Indications: diseases of neurosurgical profile and autonomic nervous system; neuritis of different localization and phantom pain; diseases of the cardiovascular system: hypertension of 1-2 stages, ischemic heart disease, obliterating endarteritis, chronic arterial and venous insufficiency; in pulmonology − acute pneumonia, bronchial asthma and pulmonary tuberculosis; digestive diseases; fractures of bones; inflammatory processes in the pelvis; in dentistry − periodontitis, catarrhal gingivitis, ulcerative and traumatic lesions of the oral mucosa, inflammatory processes of the maxillofacial area, postoperative trauma, fractures of the bones of the facial skull.

Contraindications to magnetotherapy: tendency to bleeding, blood hypocoagulation, severe ischemic heart disease, individual increased sensitivity to the factor (repeated stress responses to MF), pulmonary tuberculosis in active form.

## Test to control the FINAL LEVEL OF KNOWLEDGE

1.What are the effects of UV rays?

A. Destruction of vitamin D.

B. The formation of vitamin D.

C. Bactericidal.

D. Effect on the sympathetic nervous system.

E. Effect on the parasympathetic nervous system

2. At which doses and methods does the desensitizing effect of UV rays is achieved?

A. Suberythemal doses.

B. Erythemal doses.

C. Hypererythemal doses.

D. The course of general UV irradiation.

3. What are the physiological reactions observed in the body during UV radiation?

A. Caloric erythema.

B. Pigmentation.

C. The formation of vitamin D.

D. Lowering of cholesterol in the blood.

E. Reduction of blood pressure.

4. Which effects are observed when exposing visible rays to the body?

A. Enhancement of oscillatory motions of particles.

B. Increase of electron energy reserve.

C. Photoelectric.

D. Destruction of bilirubin.

E. Influence on emotional and mental sphere.

5. For which diseases bowel washing-irrigation is prescribed?

A. Chronic alimentary colitis.

B. Nonspecific peptic ulcer.

C. Gout.

D. Exogenous-constitutional obesity of II degree.

E. Chronic enteritis.

6. What are the properties of water as a therapeutic coolant?

A. High heat capacity and high thermal conductivity.

B. High heat capacity and low thermal conductivity.

C. Low heat capacity and low thermal conductivity.

D. Low heat capacity and high thermal conductivity.

7. What is the general mineralization of table mineral drinking water?

A. Over 4 g/l.

B. 8-12 g/l.

C. up to 2 g/l.

8. In which diseases is drinking treatment with mineral waters prescribed?

A. Peptic ulcer disease in remission.

B. Chronic tuberculous colitis.

C. Chronic gastritis with secretory insufficiency in the stage of decompensation.

D. Functional diseases of the intestine.

E. Chronic hepatitis in inactive phase.

9. In which diseases is hydrotherapy contraindicated?

A. Thrombophlebitis recurrent.

B. Progressive glaucoma.

C. A condition after a commissurotomy at insufficiency of blood circulation of I degree.

D. Hypotension.

E. Nonspecific aortoarteritis.

10. Specify the temperature for: 1) cold, 2) indifferent water procedures:

A. Below 20 ° C.

B. 20-35 ° C.

C. 36-37 ° C.

D. 38-40 ° C.

E. Above 40 ° C.

Standarts of answers: 1 – A, B, C; 2 – B, C, D; 3 – B, C, D, E; 4 – A, B, D, E; 5—A, C, D; 6 – A; 7 – C; 8 –A, D, E; 9 – B, C, D; 10 – 1-A, 2-C.

**SELF-WORK**

**of the 3rd year higher medical education applicants**

**on the topic of the practical lesson**

1. To perform all instructions of the physiotherapist and in his absence – physiotherapy prescriptions of doctors.
2. To prepare the workplace, equipment and everything the nurse needs in advance before reception of patients in a timely manner.
3. To keep order, cleanliness in the physiotherapy department strictly.
4. To stop the procedure in case of deterioration of the patient's condition, if necessary –to provide him with the first medical aid and to inform the doctor immediately, to make an appropriate mark in the procedural book.
5. To make the patients who come for treatment with the rules of local discipline and rules of behavior while receiving the procedure.
6. To keep track of work done and monitor patients receiving all prescribed treatment.
7. To understand the definition of physiotherapy, classification of physical factors.
8. To tell about the mechanisms of physiological and therapeutic effect of physical factors on the body.
9. To name the general indications and contraindications to the prescription of physiotherapy.
10. To know the definition of phototherapy (visible light, IR, UFO).
11. To name the mechanism of biological action and therapeutic effects of the magnetic field.
12. To demonstrate the methods of supplying humidified oxygen to the patient.
13. To demonstrate how to use different types of inhalers.

## Recommended literature

**Basic:**

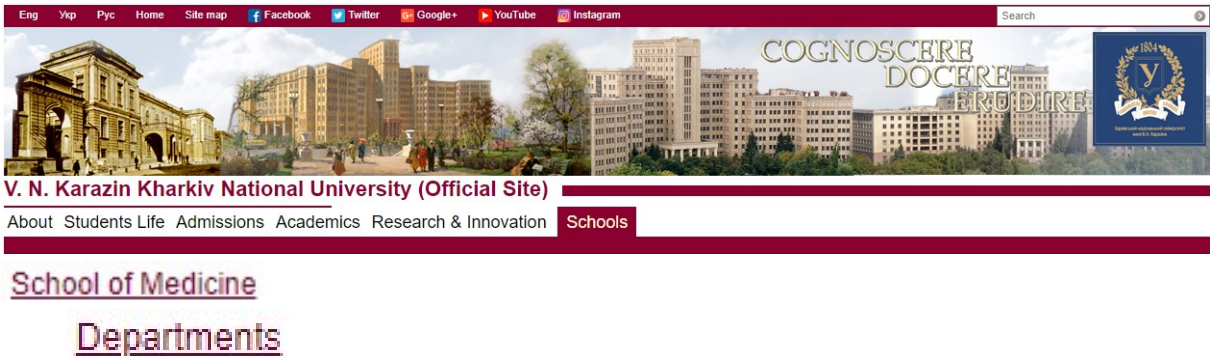

1. Buppert Carolyn. Jones & Bartlett Learning : Nurse Practitioner's Legal and Business Practice Guide. 6th edition. – 2017. – 516 p.
2. Care for patients (practice) : a textbook for students of higher medical educational institutions of the III-IV accreditation level / count. actors; ed. O. N. Kovaleva, V. N Forestry, R. S. Shevchenko, T. V. Frolova. – K .: VSI Medicine, 2014. – 432 p.
3. Kovalyova O. M., Safargalina-Kornilova N. A, Gerasimchuk N. M. Deontology in medicine : a textbook for students of higher medical schools of III-IY levels of accreditation. – Kharkiv, 2014. – 258 p.
4. Doenges Marilynn E., Moorhouse Mary Frances, Murr Alice C. Nursing Diagnosis Manual. 5th edition. – New York : F. A. Davis Company, 2016. – 1123 p.
5. Buppert Carolyn. Jones & Bartlett Learning : Nurse Practitioner's Legal and Business Practice Guide. 6th edition. – 2017. – 516 p.
6. Silver Spring : Guidelines by American Nursing Association. Nursing : Scope and Standards of Practice. 3rd esition. 2015. – 264 p.
7. Perrin K., MacLeod C. Understanding the Essentials of Critical Care Nursing. – New York : Pearson. 2017. – 640 p.


**Additional:**


1. Goroll A. H., Mulley A. G. Jr. Primary Care Medicine : Office Evaluation and Management of the Adult Patient. – Philadelphia: LWW, 2014. – 5680 p.
2. Workshop on the course "Nursing in a Therapeutic Institution" / Contributors: T. V. Ascheulova, O. M. Kovaleva, I. V Sitina. – Kharkiv : KhNMU, 2018. – 41 p.
3. Silver Spring : Guidelines by American Nursing Association. Nursing: Scope and Standards of Practice. 3rd esition. – New York : 2015. – 264 p.

Annex 1

Official site: http://www.univer.kharkov.ua/en/departments

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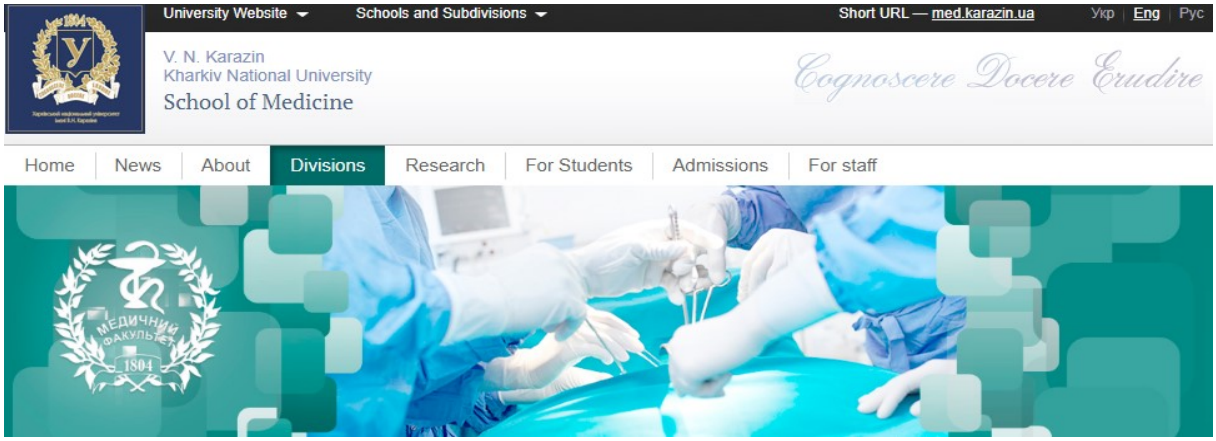


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Annex 2

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2014/03/21 repository Karazin Kharkiv National University received at the International Center ISSN (within the project ROAR supported by the information sector UNESCO) own **ISSN 2310-8665**. Thus, the repository to a full online edition (a continuously updated resource), where you can publish the results of research as in the original, along with printed periodicals.

*The best depositors-2018 – Gluschenko O.V. (Faculty of Economics), Kirichenko V.G. (Physics and Technology Faculty).*

The best depositors – Hrytsak Y.P., Chernomaz P.O., Ivanchenko, A.O. (2017, School of International Economic Relations and Travel Business), Kysil V.V. (2017, School of Philology), Khudolii M.O. (2017, Web Communications Center), Akulov O.Yu. (2016, School of Biology), Dukarov S.V. (2015, School of Physics), Domanovski A.N. (2016, 2015, 2013, School of History), Yabluchanskiy N.I. (2015, 2014, 2013, 2012, School of Medicine), Komaristaya V.P. (2014, School of Biology), Sukhonos O.V. (2013, School of Philosophy), Tomin M.S. (2011, School of Medicine).

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Annex 3

Propaedeutics of Internal Medicine and Phy. Rehab. Dep V....

The official Facebook group of the **Department of propaedeutics of internal medicine and physical rehabilitation of the V. N. Karazin Kharkiv national university.**
**News, announcements, useful information for students.**

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The base of the department is in a beautiful, quite place, far from the bustle of the big city.
Our address: Academika Kurchatova Avenue, 29.
You can get to this place from the city center, using the 296e bus (from «Derjprom» metro station), go to the "Church" stop, and continue to walk about 600 meters.
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Марія Бринза
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Signs and symptoms of urinary system disorders

Syndromes in diseases of blood system

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Responsible for translation author — Karyna H. Uvarova

**FUNCTIONING FEATURES OF THE ROOM FOR MEDICAL PROCEDURES IN THE THERAPEUTIC DEPARTMENT AND RESPONSIBILITIES OF THE NURSE FOR ITS PROVIDING. FUNDAMENTAL RULES OF INHALERS ADMINISTRATION. METHODS AND TECHNIQUES OF OXYGEN ADMINISTRATION AND USING OF OXYGEN CUSHION. REVIEW OF PHYSIOTHERAPEUTIC PROCEDURES (HYDROTHERAPY, PHOTOTHERAPY, ELECTROMAGNETIC THERAPY)**

Methodological recommendations for independent preparation for practical classes for the 3rd year higher medical education applicants in the discipline «Nursing practice. The main duties and professional activities of medical nurse in therapeutic department»

Коректор

Electronic publication on official website of V. N. Karazin Kharkiv national university — page of the Department of propedeutics of internal medicine and physical rehabilitation of the School of medicine, section "Educational materials for students / Guidelines"