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The textbook presents the main aspects of therapeutic patient care at the up-to-date theoretical and practical level; the technique of medical manipulations is set out. The principles of the organization of therapeutic regimen and patient care, skills to perform the necessary medical manipulations are considered. Attention is paid to the observance of moral and deontological principles by medical professionals. For each unit, tests and theoretical questions are provided for a better understanding of the material. The Appendix contains standards for the most common manipulations and emergency medical care. The textbook is designed for students of the International aculties with English medium of study, higher education institutions of Ministry of Health of Ukraine, majoring in Dentistry, and can be used to prepare for the practical training of students majoring in Medicine.

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Introduction

According to the current requirements it is necessary to improve the quality of education and to ensure comprehensive training of medical university graduates for the professional activity of a physician. The main objectives of the theoretical and practical training of international students with English medium of study in dentistry, future dentists, is to teach the ability to recognize the most common internal diseases and conditions that threaten the lives of patients by external signs and anamnesis data, as well as know the tactics of the dentist in providing care to patients with somatic pathology. In future practice, dentists should be able to assess the significance of somatic pathology in the onset and course of oral diseases and/or the impact of oral diseases on the development of somatic diseases.

The study of the fundamentals of internal medicine is of paramount importance for the training of physicians of all specialties. First aid for traumatic injuries, hemorrhage, clinical death, shock, and other emergencies, injections, and other manipulations are the responsibility of any physician in any specialty.

The patient care practical training is the basis for the study of internal medicine. The main purpose of the patient care practical training is to form the basis for further study of clinical disciplines, namely, propaedeutics of internal medicine, medical psychology, internal medicine, infectious diseases. In the course of training, integration with the above disciplines is provided, as well as the ability to apply the acquired knowledge on patient care in the process of further training and in the professional activity.

The main purpose of writing the textbook is to present the information in a form that will contribute to a better understanding of the theoretical material and improve the assimilation of practical skills and features of assistance to therapeutic patients with diseases of internal organs. It is important to form the ability to provide psychological and specialized medical care. It is from the timely, professional actions of a physician that the success of preventive and therapeutic work will depend.

UNIT 1

Basic principles of general and specialty care for therapeutic patients

1.1. Historical data on the formation of medical care provision for a sick individual

Archaeological evidence from ancient times shows the application of health-preserving measures in the primitive society, along with the assistance in case of wounds, accidents and childbirth. These activities were mainly carried out by women whose duty was to keep the premises clean, to observe the rules of performing hygienic rituals by the members of the tribe, to provide medical aid, to collect medicinal raw materials (plants, roots, etc.). Later, with the emergence of various forms of economic activity, class differentiation and spread of religions, hygienic rituals gradually acquire the character of sacred action. The preservation and further development of the above rituals became the duty of the family elders and gave rise to the formation of the caste of pagan priests who undertook the duty of curing diseases and prolonging life expectancy.

During the formation of the first states, the factor of preserving the life and health of the population becomes important, which is an effective component of domestic policy: compliance with hygienic and anti-epidemic rules, attempts to organize medical care. Isolation of infectious / epidemic patients was introduced; control over the qualifications of a doctor and protection of the rights of a doctor and his/her medical practice; establishment of responsibility for illegal treatment, medical errors.

In Mesopotamia (XVIII century BC), treatment was regulated by financial reward for successful medical care and punishment for

unsuccessful results. Medicine was of great importance in ancient India. The main moral principles of a doctor were contained in the Ayurveda (Science of Life) treatise. According to ancient Indian studies, a doctor was obliged to have moral and physical qualities, to express sympathy for a sick person, to have inner peace, to inspire the patient to be confident in a favorable outcome of the disease. According to the principles of the Sushruta studies, a doctor should be aware of the intricacies of the therapeutic art: be a good practitioner and thoroughly know theoretical medicine.

In ancient times, the philosophical approach existed regarding the role of medicine in the life of a person and society, which was reflected in the postulate: «Medicine cannot save from death, but is able to prolong life, strengthen the country and peoples with its advice». A wide discussion in the circles of doctors with different clinical experience of complex cases of diagnosis and treatment was accepted into practice.

In ancient China, the main provisions for the organization of medical care were described in the Huang di Nei-Dzin's treatise «On the nature and life». The main difference in the medical activity of Chinese doctors was the psychological approach to a patient. During the treatment, doctors took into account the individual character of the patient.

Medical care in Persia was similar to ancient Chinese – a doctor was obliged, first of all, to take into account the personality of a patient and, in accordance with this, carry out diagnostics and treatment. Persian doctors were distinguished by their attention to the patient, which allowed them to notice the first manifestations of the disease and make a diagnosis of the disease at the initial stages. Another feature of the Persian doctor was the ability to influence the mental state of a patient with his personality, moral qualities. In society, a doctor was perceived as a demigod, there was a sacred faith in his art, which contributed to a faster recovery of a patient. In Persia, doctors were divided into categories: «holiness healers», «knowledge healers», «knife healers».

The formation of medical care in Ancient Greece is divided into 2 periods: before the studies of Hippocrates and during Hippocrates' period of medical activity. The laws of Lycurgus (IX-VIII centuries BC) established a system of hygienic and physical education. At that time, control was introduced over marriages and newborns. Healthy

newborns were subject to further social education, the sick and weak – to death. Special officials, the ephors, were responsible for the system of public education.

The main principles of the pre-Hippocratic period of the development of medicine were: respectful attitude to the personality of a doctor in the society; personalized attitude of a doctor towards patients. Hippocrates summarized the experience of medical practice in his works «On the Doctor», «On Decent Behavior», «On the Art», «Aphorisms». He outlined the basic principles of medical care: recommendations regarding the norms of physician behavior, equal rights to receive medical care, introduction of an understanding of medical secrecy, features of the regulation of relationships between doctors. Hippocrates recommended that efforts to treating the patient were to be directed not only to a doctor, but also to the family members of the patient and his community, believing that it is these circumstances that will contribute to the patient's recovery. Hippocrates believed that the relationship of doctors should be aimed at supporting the interests of a patient. In the event that the doctor has difficulty in establishing a diagnosis, he should consult with colleagues. Hippocrates noted that there was nothing shameful if a doctor was experiencing difficulties or, due to his inexperience, asked to invite other doctors, with whom he could find out the patient's condition and who would help him.

The main postulates of medical ethics, set forth in the «Hippocratic Oath» remain relevant today:

- «Non nocere» («Do no harm!»). Treatment, actions, doctor's advice should be directed in favor of the patient;
- human life is an unconditional value;
- a doctor must respect the privacy of patients, must refrain from immoral acts;
- a doctor is obliged to keep medical confidentiality, to respect his/her profession.

Hippocrates was the first physician whose works have been preserved and have not lost their relevance to date. Hippocrates is rightfully considered the «father of medicine». The tradition is still preserved – medical graduates take the «Hippocratic Oath», which contains the basic ethical rules of the doctor's behavior.

The transition to the state system of training medical professionals and managing the activities of doctors has its origins in ancient Rome. In large cities, chief doctor, called archiater, were appointed, who provided medical assistance to wealthy citizens. The provision of medical care to the rest of the population was carried out by traditional healers. Additionally, doctors were appointed, who assisted in the performances: in the theater, circus, gladiator fights. Claudius Galen in his early years was appointed as a physician of gladiators. The most significant achievement of the Roman health system is the construction of hospitals. Subsequently, in connection with the threat of epidemics, they began to organize medical care for the less-well-off category of the population.

In the II millennium (starting from the XII century) with the emergence of large cities, the management of the process and the organization of medical care was taken over by the city government. The most characteristic feature of medicine in the Middle Ages was the formation of monastic orders (Franciscan, Benedictine, Dominican), which provided an opportunity for the treatment of patients in monasteries. Due to the fact that in the XVI century there was no centralized government, the main functions of providing medical care were carried out by feudal lords and city government bodies. During this period, court medicine appeared under kings, Pope, and princes. Among the wealthy members of society, a system of family doctors was spreading, who took care of nutrition, were engaged in the improvement of premises, prevention of diseases and, if necessary, treatment. For poor patients, shelters were being built in large cities, public hospitals for all citizens.

Medical schools were being set up to train doctors. The centers of medical education in Western Europe were universities opened in the VIII century in Salerno; in the XII-XIII centuries in Bologna (1158), Paris (1125), Padua, Oxford; in the XIV century in Prague (1348), Vienna, Krakow (1364). At first, the educational institutions were private, but later they fell into dependence on the church, which completely controlled the activities of the universities.

1.2. Organization of medical care in Ukraine in the historical aspect

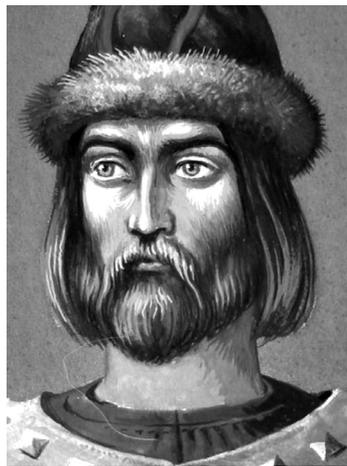
The peoples who lived on the territory of Ukraine in ancient times possessed important medical knowledge. Scythian doctors had skills in tooth extraction, surgical procedures and manipulations. In Kyivan Rus there was a system of training and organizing the work of doctors (healers). The provision of medical care was provided by doctors who served at the courts of the Kyiv princes; doctor-priests who helped patients in shelters at monasteries and churches; healers (medicine men, magicians, sorcerers).

Throughout the X century at the monasteries of Kyivan Rus, patients were treated, care for widows, orphans, old people, beggars was provided. The Kyiv-Pechersk Monastery played a particularly important role in the introduction of medical care and enjoyed wide popularity in medical practice. The collection of laws «Russian Truth» by Yaroslav the Wise (Fig. 1.1) reflected the influence of the church in the provision of medical care at that time. Churches provided public care for the population, free medical care, and the construction of hospitals.

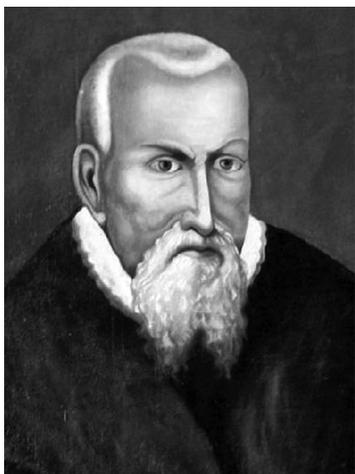
In Lviv and Galicia in the XIII-XIV centuries the provision of medical care was carried out at monasteries, practiced by doctors, whose therapeutic approaches were formed on the basis of folk traditions.

The Ukrainian physician who was successfully engaged in medical practice and scientific activity at that time was Doctor of Philosophy and Doctor of Medicine Yuri (Georgii) Drohobych-Kotermak (Fig. 1.2).

The opening of the first medical higher education institutions took place in the XVI-XVII centuries in Ostrog (1578), Zamoisk Academy (1593), Medical Faculty of Lviv University (1661).



*Fig. 1.1. Yaroslav the Wise
(983/987 – 17/20 February, 1054).*



*Fig. 1.2. Yuri (Georgii)
Drohobych-Kotermak
(1450–1494).*



*Fig. 1.3. Petro Mohyla
(1596-1647).*

Metropolitan Petro Mohyla contributed to the improvement of the quality of medical care (Fig. 1.3). He was the founder of the Kyiv-Mohyla Academy (1633), the famous personality in the Orthodox Church and education.

In Ukraine, in the period of XX-XXI centuries, state financing of public health care was being introduced. The main efforts were directed to the organization of public health: planning and management, taking measures to reduce the time of disability. An important aspect of medical care was prophylactic medical examination service. Since the independence of Ukraine, a partial reform of medical care has been carried out, and continues to date. Financing of medicine is carried out partially from the state budget, but the principles of private, insurance medicine are being actively introduced. The main directions of the organization of public health in Ukraine are prevention of diseases and introduction of a healthy lifestyle; formation of the new system of management; creating conditions for the development of the private sector of medical services; the introduction of family medicine; organization of adequate medical and logistical support; reforming of medical higher education.

1.3. Defining the role of patient care in the therapeutic and diagnostic process

Patient care is the basis of the system for providing medical care to a sick person and is defined as actions that ensure relief of the patient's condition and successful treatment, namely, creating the necessary hygienic conditions, alleviating symptoms, preventing possible complications, and fulfilling medical prescriptions. Successful treatment of a patient fully depends on professional care; well-being and mental state play an important role in conducting therapeutic, diagnostic and preventive procedures to improve the patient's health. The organization of patient care provides for the participation of nurses and assistant nurses, who are to be familiar with the methods of care and master the basic principles of medical deontology. The primary responsibility for carrying out patient care activities at the hospital rests with the physician and the Head of the Unit.

Patient care is divided into two categories: ***general and special***.

General care is carried out in relation to any patient, regardless of the type and nature of the disease, age, gender.

The main activities of general care are:

- 1) hygienic maintenance of the room, bed and furniture, the patient himself/herself, his/her clothes, dishes, personal hygiene items;
- 2) strict implementation of all prescriptions made by a physician;
- 3) monitoring the course of the disease, the patient's condition and informing the physician about changes in the patient's condition;
- 4) patient's nutrition.

General patient care includes:

1. Provision of a hygienic environment for the patient and care for him/her:

- compliance with sanitary and hygienic and medical and protective regimen;
- observance of personal hygiene of seriously ill patients;
- assistance with eating, various physiological functions;
- alleviating the suffering of the patient, calming, encouraging, maintaining faith in recovery.

2. Observing patients and carrying out preventive measures:

- monitoring the functions of all organs and systems of the body;

- first aid (assistance during vomiting, dizziness; artificial respiration, chest compressions);
 - prevention of complications that arise in case of unsatisfactory care of seriously ill patients (bedsores, hypostatic pneumonia).
3. Execution of medical prescriptions:
 - carrying out medical procedures and manipulations;
 - carrying out diagnostic manipulations (collection of urine, feces, duodenal and gastric contents).
 4. Maintaining medical records.

Special care is a set of activities aimed at providing manipulations due to the characteristics of the course of the disease or injury and the treatment of the disease. Specialty care provides measures applicable only to patients with surgical, infectious, urological, gynecological, mental illnesses.

The leading role in carrying out the activities of patient care of the inpatient unit is given to the nurses and assistant nurses. The scope of work of the medical personnel is regulated by the functional responsibilities.

1.4. Professional duties of medical personnel in the outpatient and inpatient units of a hospital

A medical professional must know:

1. Human anatomy and physiology.
2. The mechanisms of the development of the pathological process in the body, its course, possible complications.
3. The effect of medical procedures (enemas, baths, leeches, etc.).
4. Features of personal hygiene of seriously ill patients.

A medical professional must be able to:

1. Evaluate the patient's vital signs (pulse rate, blood pressure, respiratory rate).
2. Estimate the signs of the disease (shortness of breath, swelling, sudden pallor, respiratory failure, heart failure).
3. Perform hygiene procedures.
4. Provide emergency medical care, if necessary.
5. Perform medical manipulations (changing underwear and bed linen, assistance with a bedpan, performing injections).

Responsibilities of a physician in patient care:

1. To control the correct and timely execution of the prescribed medical and diagnostic procedures by the nurses and assistant nurses, and the maintenance of medical records.
2. To assign and control measures for patient care: a) type of sanitization; b) type of transportation; c) type of the ward; d) position of a patient in bed, the use of a functional bed; e) diet.
3. To prescribe and supervise medical interventions performed by a nurse.
4. To assign and evaluate the scope of diagnostic manipulations that the nurse must perform (duodenal intubation, collection of material for the lab tests, etc.).
5. On a regular basis to perform the enhancement and control of the knowledge of nurses and assistant nurses in order to assess and improve the level of qualification; to conduct sanitary and educational work with patients and members of their families, teaching them the basic rules of patient care.

Responsibilities of a nurse in patient care:

1. Organization and implementation of hospitalization procedures for patients, checking the sanitization, familiarizing the patient with the internal regulations.
2. Fulfillment of the medical prescriptions made by the physician (mark the fulfillment in the prescription sheet).
3. Patients' nutrition for diagnostic tests.
4. Collecting material for laboratory study, sending the material to the laboratory.
5. Monitoring the transportation of patients for examination to diagnostic rooms.
6. Control over the implementation of measures of sanitary and hygienic regimen and maintenance of personal hygiene of seriously ill patients.
7. Providing nutrition for patients.
8. Thermometry and registration of temperature indicators in temperature sheets.

9. Participation in conducting a doctor's round, informing the physician about changes in a patient's condition over the 24 hours and receiving new prescriptions.

10. Carrying out the assessment of the main vital functions: assessment of blood pressure, pulse rate, respiratory rate, 24 hour's diuresis.

11. Assess the severity of a patient's condition and provide emergency care, and, if necessary, call a physician.

12. Maintaining medical records: prescription sheets, temperature sheet, duty schedule list, medical prescription list.

13. Supervision of the work of assistant nurses.

A medical professional should thoroughly wash the hands with soap and water before each procedure.

Professional clothing for medical personnel is a white coat, hat, changeable shoes. The nurse should have an extra coat that she/he uses when distributing food to patients. Nurses should remove professional clothing when visiting the toilet / sanitary facility or outside the hospital. Ignoring this rule can lead to the spread of nosocomial infection.

Responsibilities of assistant nurses:

1. Daily cleaning of all premises of the unit.
2. Change of linen of patients, with the help of a nurse, if necessary.
3. Assistance with a bedpan, urinal.
4. Washing, bathing, skin, nails and hair care of seriously ill patients.
5. Transportation of seriously ill patients.
6. Delivery of biological material to the laboratory.

An assistant nurse has no right to distribute food, feed seriously ill patients, or wash dishes.

1.5. Formation of moral, ethical and deontological principles of a medical specialist.

Principles of professional subordination

Patient care, first of all, requires compassion for a patient. Patient care procedures must be professional and respect the rules of medical ethics and deontology. After all, medical science and practice has a close connection with the fate of a person, his/her health and life.

Ethics of a doctor is part of the general ethics; it is the science of moral principles and behavior of a doctor during his/her work. It includes compliance with the norms of behavior and morality, assessment of the sense of professional duty, honor, conscience and professional dignity of a doctor.

Specific moral principles that are relevant to defining and adhering to the ethical principles of a healthcare professional have their practical expression in relation to a healthcare professional in relation to a patient during communication both with a patient himself/herself and with his/her family.

The moral code of a medical professional is denoted by the term «deontology» (*from the Greek «deon» – duty and «logos» – teaching*). Deontology is the studies about the duties of a medical professional during the provision of medical care and a set of ethical standards necessary to fulfill his/her professional duties.

Principles of professional subordination. The basis of the relationship between medical personnel is professional subordination, which is based on the principle: a physician – nurse – assistant nurse. The relationship between a physician, a nurse and an assistant nurse is built on a business basis, mutual understanding and respect.

The relationship between a physician and a nurse. A ward doctor works closely with a nurse who directly executes his/her prescriptions. A nurse takes care of a patient, it is she/he who first notices changes in a patient's condition (loss of appetite, the emergence of allergic reactions, etc.) and provides this information to a physician. All questions that can arise during the execution of medical prescriptions should be given to the attention of a physician for explanation and clarification. If an error occurs during the procedure, a nurse should immediately notify a physician.

The relationship between a nurse and an assistant nurse. An assistant nurse is subordinate to the ward nurse. The nurse's orders must be clear, non-contradictory and consistent.

Joint actions of a nurse and an assistant nurse:

- change of bed linen and underwear;
- bathing a patient;
- transportation of a patient.

If an assistant nurse is busy, a nurse can assist a patient with a bedpan, urinal.

The relationship between medical personnel and patients. A medical professional must not only responsibly fulfill his/her duties in relation to a patient, but also take care of his/her physical condition and mental health, and maintain medical confidentiality. While communicating with a patient, talk tactfully, soothingly, keep a patient's hope for recovery and return to working capacity.

UNIT 2

The concept of therapeutic, sanitary, and hospital regimens in a therapeutic inpatient unit

The therapeutic unit at the hospital is one of the main divisions of a medical facility, designed to organize and provide medical care to patients with diseases of internal organs that require long-term treatment, care, and complex diagnostic procedures. The work of the therapeutic unit at the hospital includes the involvement of number of subunits / units that provide examination and treatment of patients, namely: admission, diagnostic, physiotherapy and auxiliary units (administrative and economic part, catering unit).

The main guarantee of successful treatment of patients is the introduction of a hospital regimen, which ensures the implementation of medical, protective and sanitary measures. The regulation of the hospital regimen is established by the hospital administration on the basis of approved model regulations. ***The hospital regimen*** determines the time and sequence for the patient to perform the main therapeutic and preventive measures, manipulations, procedures (morning wake up, daily temperature measurement, intake of food (breakfast, lunch, dinner), medications, fulfillment of medical prescriptions, hours of rest, visiting patients, night sleep). Visitors to the patients of the unit must wear a medical gown and shoe covers and can meet in specially designated rooms at a certain time: from 17.00 to 19.00. The seriously ill patients are visited in the ward.

It is forbidden to give a patient product that can be spoiled quickly, namely: Bologna sausage, cakes with cream, canned food, milk. Food products that are checked by a nurse are stored in the refrigerator, in plastic bags, labeled with the patient's name, date, room number.

The sanitary regimen includes organizational, sanitary, hygienic and anti-epidemic measures aimed at preventing the occurrence of nosocomial infection. The sanitary and hygienic regimen ensures compliance with the requirements for the sanitary condition of the territory where the hospital is located, the internal equipment of the hospital, lighting, heating, ventilation and the sanitary condition of the hospital premises. The main elements of ensuring the sanitary and hygienic regimen of the hospital are disinfection, compliance with the requirements of aseptics, antiseptics and sterilization.

2.1. Functions and organization of work of the Admission Unit

The Admission Unit is an inpatient department of a hospital that provides admission, registration, sanitary and hygienic treatment, and transportation of patients to the specialized department. In the Admission Unit, primary medical examination of patients is carried out and emergency medical care is provided to them (if necessary), the corresponding medical documentation is filled out.

Admission Unit includes the rooms:

- admission and registration of patients;
- doctor's office;
- isolation ward;
- sanitary room;
- treatment room.

In the registration office, patients are admitted and registered, as well as primary medical documentation is filled out. In the examination rooms hospital examination is made, anthropometric studies, emergency medical care is provided. In the sanitary room, general and special sanitization of patients is carried out before they are transported to the hospital.

In the registration office for each hospitalized patient, the corresponding **medical documentation** is filled in:

1) **medical history**, in which the full name of the patient is recorded; medical history number; age; home address; phone number; profession; date and duration of hospitalization; by whom the patient has been referred. If the patient is unconscious, the necessary data should be

obtained from the accompanying staff. The medical history is the main medical document that is filled in for each patient.

2) ***patient admission log and hospitalization refusals***, in which, in addition to the full name, the date and period of hospitalization of the patient, by whom and when has been referred, is recorded. In case of refusal of hospitalization, reasons for refusal are stated.

3) ***exchange card*** is intended for subsequent registration of the diagnosis, laboratory tests and medical measures in the inpatient unit.

4) ***the register of material values taken for storage from the patient*** contains a list of the patient's belongings, certified by his/her signature.

If the patient's condition requires urgent medical assistance, the documentation is filled out after the appropriate treatment measures have been taken. After registration, an initial medical examination is carried out. During the initial examination, the hairy parts of the patient's body are additionally examined for the presence of head lice, open parts of the skin for the detection of skin and infectious diseases.

Anthropometric data are assessed: height, body weight, chest and head circumference.

Height measurement is carried out using a special device, called stadiometer (Fig.2.1).

The vertical stand of the device has centimeter divisions. A horizontally located bar moves along the tripod. The patient stands with his/her back to the tripod, firmly touching it with heels, buttocks, shoulder blades and the back of the head. The patient's head is positioned in such a position that the upper edge of the external auditory canal and the corners of the eyes are on the same horizontal line. The tablet is lowered onto the patient's head and the divisions are counted on the scale to the lower edge of the tablet. The results obtained are recorded in the medical history.



Fig. 2.1. Stadiometer.

The height of a seriously ill patient is measured with a measuring tape in the patient's lying position (Fig. 2.4).

The patient's body weight is measured on a medical scale (Fig. 2.2 and Fig. 2.3). Weighing is carried out on an empty stomach after emptying the bladder and intestines. The patient, stripped to underwear, carefully stands in the middle of the weighing platform with the shutter lowered. When equilibrium is reached, the shutter of the balance is raised; the weight is moved on the bars of the balance beam on the left until it is level with the control line. Then the scale shutter is lowered again, and the indicators of the lower and upper bars are summed up. The resulting data are recorded in the medical history. Inpatients are weighed once a week. Weighing of patients with obesity, malnourished patients and patients with edema is carried out twice or three times a week.



Fig. 2.2. Mechanical scales.



Fig. 2.3. Electronic scales.

Measurement of the circumference of the chest is performed with a soft centimeter tape (Fig. 2.4) on the 4th rib (under the nipples in men) and under the shoulder blades. At the same time the patient's arms should be put down. The circumference of the chest is measured during maximal inhalation, as well as during calm breathing.

Measurement of the abdominal circumference is important in patients with ascites (measured daily), as well as in obesity (measurement is performed on an empty stomach).

A centimeter tape (Fig. 2.4) is applied at the level of the navel, posteriorly at the level of the 3rd lumbar vertebra. The results obtained are recorded in the medical history.

Body mass index (BMI) is a value that allows assessing the degree of correspondence between human body weight and height.

The formula for determining the body mass index:

$$I = \frac{m}{h^2},$$

m – body mass in kilograms; h – height in meters; I – is measured in kg/m².

After determining the anthropometric data, a nurse assists the physician in examining the patient and providing him/her with medical care, and then provides for sanitation.

Sanitary and hygienic procedures for the patient. The procedure is carried out taking into account the patient's condition, the nature of the disease. In a very serious condition (shock, coma, myocardial infarction, convulsions, loss of consciousness), the patient is urgently transported to the appropriate unit, or provided with emergency care directly in the emergency unit without preliminary sanitization.

In a satisfactory condition, a patient takes a hygienic bath or shower. If it is impossible to wash by himself/herself, the patient is assisted by the staff of the Admission Unit. In modern hospitals, bathrooms are provided with sterile bags with clean linen and a washcloth. The average duration of a bath or shower is 20–25 minutes. While taking a bath, medical personnel must constantly monitor the patient's condition.

Hygienic washing of seriously ill patients is carried out by medical personnel. Such patients are washed with a soapy washcloth: first

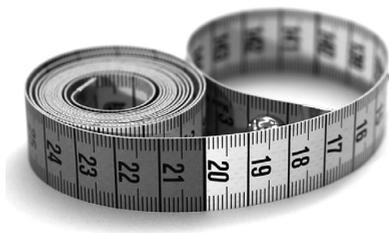


Fig. 2.4. Centimeter tape.

the head, then the body and lower extremities. Thoroughly wash out places of intense physiological discharge: inguinal and underarm areas, sites under the mammary glands, in the interdigital folds. After use, the bath must be washed with a special washcloth and soap, and then disinfected with a 2% chloramine solution.

When carrying out sanitization of patients with pediculosis, a nurse puts on a mask, gloves, an additional gown and a kerchief. The patient is seated on a couch covered with oilcloth and the scalp is treated with special solutions. The hair is covered with cotton and then oilcloth kerchiefs and left for 30 minutes. After that, the hair is washed with warm water, rinsed with a solution of acetic acid and combed over the oilcloth with a fine comb for 9–15 minutes. For pregnant women, children under 5 years of age, individuals with scalp damage, the use of karbophos is contraindicated. In these cases, 5% boric ointment, 0.25% Dicresilum emulsion, 0.5% methylacetophos solution in equal amounts with acetic acid and soap emulsion are used.

On the title page of the medical history, a mark "P" is made, and the patient is re-examined after 9 days. After sanitization, the patient is transported to the specialized department, according to the profile of the disease.

Transportation of patients. Transportation of patients to the unit can be done in several ways. Patients in a satisfactory condition are transported to the ward, accompanied by a medical worker. In a state of moderate severity, the patient must be delivered to the ward on a chair or a gurney (Fig. 2.5.).



Fig. 2.5. Means for patient transportation.

Seriously ill patients are transported to the department on a stretcher with a clean sheet, covered with a blanket, which is placed on a special trolley. When climbing stairs, the patient is carried in head-first position by two, three or four people who are out of step.

When placing patients from the stretcher to the bed, certain rules must be followed: the foot end of the stretcher must be placed perpendicular to the head end of the bed. If the area of the ward does not allow, the stretcher can be placed parallel to the bed, leaving a gap between the bed and the stretcher to accommodate the persons who are carrying the patient. It is necessary to face the patient, put the hands under his/her head, buttocks and legs, and then carefully place the patient to the bed.

UNIT 3

Organization of work of the Therapeutic Units of an inpatient hospital

Therapeutic Unit is a subdivision at a hospital (clinic) in which conservative treatment of patients with various diseases of internal organs is carried out: cardiovascular, respiratory systems; digestive organs; kidney; some diseases of the musculoskeletal system. Along with therapeutic, there is a network of specialized or profile units: cardiology, gastroenterology, pulmonology, nephrology, endocrinology.

The structure of the Therapeutic Unit (general or specialized) consists of:

- post of a ward nurse;
- wards for accommodation of patients;
- doctor's office, which is a workplace for the physicians;
- Head of the Unit office;
- head nurse office;
- manipulation room;
- treatment room;
- canteen;
- bath/shower room;
- lavatory.

The *ward nurse's post* is a workplace designed to serve 25–30 patients. A post is placed near the wards so that patients can be constantly monitored by a nurse. Most often it is located in the corridor niche.

The equipment of the ward nurse post is:

1) a table with drawers that must be locked. The table can store medical records: medical history; prescription sheets; temperature, procedural sheets; portioners, etc.;

- 2) special storages for storing medications: separately for groups «A» (poisonous) and «B» (strong);
- 3) a metal table for placing sterile materials (cotton wool, bandage), containers with disinfectant solutions;
- 4) a table for placing medications for patients;
- 5) a refrigerator that stores liquid products that deteriorate quickly, infusions, decoctions, vaccines, serums;
- 6) light alarm panel;
- 7) telephone;
- 8) means of emergency lighting;
- 9) personal hygiene products: washbasin, soap, towel.

Nurses and assistant nurses are responsible for implementation of measures for the care of patients of the inpatient hospital. The scope of their work is regulated by functional responsibilities, which are presented in Unit 1 (1.4). The immediate assistants of nurses in the performance of care are assistant nurses. Their functional responsibilities are described in Unit 1 (1.4).

The organization of the working time of the assistant nurses and the daily routine of the patient is carried out according to the daily routine of the Inpatient Unit (Table 1).

Table 1.

Daily routine of the Inpatient Unit

Time of the day	Daily routine of the patient	Responsibilities of the ward nurse
7.00–7.30 a.m	Waking up, temperature measurement	The light in the wards is turn on (in winter), thermometers are distributed, temperature measurement is controlled, and the data is recorded into the temperature sheet.
7.30–8.00 a.m	Morning toilet	Assistance in the execution of the morning toilet for seriously ill patients is provided, the bed linen is changed or the bed is made, biological material (urine, feces, sputum) is sent to the laboratory, the wards are aired.
8.00–8.10 a.m		Participation in the morning meeting of the nurses.
8.10–8.30 a.m		Shift of duty

Continuation of the table 1.

8.30–9.00 a.m	Intake of medications, prescribed to be taken before meal.	Medications, prescribed to be taken before meal are distributed.
9.00–9.30 a.m	Breakfast	Assistance is provided during meal distribution, nutrition is made for seriously ill patients.
9.30–11.00 a.m	Doctor's round	Participation in the round, making records on prescriptions or prepare patients to examination, accompany patients to the diagnostic rooms.
11.00–13.00 p.m	Treatment procedures	Perform medical manipulations, administer injections, apply compress, take care of seriously ill patients.
13.00–13.30 p.m	Intake of medications	Distribute medications.
13.30–14.30 p.m	Lunch	Assistance in distribution of meal, nutrition of seriously ill patients.
14.30–16.30 p.m	After-lunch rest	Airing of the wards, monitoring of seriously ill patients and silence in the unit.
16.30–16.50 p.m		Shift of duty
16.50–17.20 p.m	Temperature measurement	Distribution of thermometers, control over temperature measurement, make records in the temperature sheet.
17.20–19.00 p.m	Visiting hours	Stay on the nurse's post. Control over the contents of the parcels.
19.00–19.30 p.m	Intake of medications	Distribution of medications.
19.30–20.00 p.m	Dinner	Assistance in distribution of meal, nutrition of seriously ill patients.
20.00–21.30 p.m	Treatment procedures	Perform medical manipulations; administer injections, clysters, cupping-glasses, mustard plasters.
21.30–22.00 p.m	Evening toilet	Hygienic wash of seriously ill patients, make the bed, assistance in taking a comfortable position. Airing the wards.
22.00 p.m.–	Preparation to sleep.	Put blankets on seriously ill patients. Turn off the lights in the wards. Monitor the observance of silence in the wards.
22.00–7.00 p.m	Night sleep	Do round in the unit every hour.

3.1. Organization of hygienic care in a therapeutic inpatient unit

Wet cleaning of interiors, wards, functional rooms of the unit is carried out using disinfectants: 0.2%–0.5% bleach solution, 0.5%–1% chloramine solution or 0.05% lysoformin plus solution. Carrying out wet cleaning is included in the functional duties of assistant nurses.

During wet cleaning, patients with a free regimen must leave the ward, only seriously ill patients can stay in it. Before wet cleaning, sweep the floor with a damp broom or mop from the walls to the middle of the room. Then, with a rag moistened with 0.2% bleach solution or 0.5% chloramine solution, wash the floor in the direction from the windows to the door. Furniture, window sills, central heating radiators, lighting fixtures are wiped with a damp cloth at least twice a week. When carrying out wet cleaning, attention is paid to the sanitary condition of the bedside tables. Together with wet cleaning or immediately after it, air the room, and then irradiate it with a bactericidal lamp.

The required conditions in the ward are sufficient lighting, maintaining the air temperature in the ward within 18–20°C, ensuring the cleanliness of bedside tables, nightstands, tables, stools, creating calm and rest in the wards. Conversations with patients should be conducted in a low voice and be sustained in a calm, balanced tone. In the process of performing care measures, it is necessary to politely explain to the patient the therapeutic feasibility of a regulated procedure for a particular procedure and highlight its role in the successful treatment of the disease.

Hygiene care includes bed hygiene and patient personal hygiene.

Hygiene of the bed and bed linen is of great importance in ensuring the hygienic care of the patient. In hospital settings, nickel-plated beds are more often used, they are easier to wash and disinfect. The head end of the bed should be positioned against the wall so that the patient can be freely approached from both sides (right and left). Special castors are attached to the legs of the bed, enabling its movement.

The bed linen should be neat and comfortable, with a flat surface. For some patients, for example, with a disease of the spine, specialized functional beds are used. In seriously ill patients who are on the bed rest, oilcloth or disposable diapers are placed under the buttocks along

the entire width of the bed, the edge of which is fixed. In case of an attack of suffocation, in order to provide the patient with a semi-sitting position, use additional one or two pillows, or raise the headrest of the bed. Cover the patient with a blanket. A table is placed near the bed for storing the patient's personal belongings, first of all, personal hygiene items.

In order to ensure a comfortable position for the patient, a functional bed is used. It consists of three movable sections, the position of which can be changed using the appropriate tools or handles. Modern, functional beds are equipped with bedside tables, drip stand, bedpan and urinal sections.

Qualified patient care and the provision of timely emergency medical care to a patient largely depend on assessing the position of the patient in bed.

Depending on the state of health and the severity of the disease, the following types of **positions of the patient in bed are distinguished:**

a) *active* – in which the patient can, without assistance, take a different positions, get out of bed, walk, visit the dining room, lavatory, etc.;

b) *passive* – in which the patient is not able to independently take a comfortable position, change it, move in bed, change the position of individual parts of the body. This situation indicates the serious condition of the patient or his/her excessive weakness, or exhaustion;

c) *forced* – a condition in which a patient voluntarily (active forced), or due to a painful condition or as prescribed by a physician (passive forced) takes a position that can improve his/her health, not significantly affect it or even worsen it.

Change of bed linen and underwear. Underwear and bed linen should be changed regularly, at least once a week, after a hygienic bath. Sometimes linen is changed as needed. Depending on the patient's condition, various methods of changing underwear are used. A patient with a free regimen can change clothes on his/her own. For seriously ill patients, the underwear is changed by the medical staff. The change of bed linen for seriously ill patients is carried out with a minimum expenditure of the patient's efforts. First of all, remove the used sheet. To do this, it is rolled up into a roller alternately from the side of the head

and legs to the pelvic part of the patient, and then carefully removed from under it. A clean sheet, rolled in the form of a bandage (on both sides with rollers), is carefully brought under the patient's sacrum, and then straightened sequentially towards the head and legs so that no folds remain on the sheet. The sheet for a seriously ill person can be changed in another way: the patient is carefully moved to the edge of the bed, the used sheet is folded along the length, a clean sheet is laid out in the vacant place, onto which the patient is placed.

When changing underwear in seriously ill patients, it is necessary to take the arms under the sacrum, grab the ends of the shirt and carefully pull it to the head, then raise both hands of the patient and throw the shirt rolled at the neck over the head. After that, the sleeves are removed. They put on the shirt in the reverse order: first, they move their arms into the sleeves (if one arm is injured, start with it), then the shirt is thrown over the head and straightened on the patient's body. Sometimes, it is advisable to use a shirt, sewn in the form of a vest, which can be easily put on with minimal disruption to the patient's physical condition.

Skin care. Patients who have been on bed rest for a long time due to chronic diseases may experience various changes in the condition of the skin: rash, peeling, diaper rash, ulcers, bedsores. Skin care is one of the important components of general patient care.

For bedridden patients, the skin is daily wiped with a towel or gauze napkin moistened with camphor alcohol, diluted with table vinegar (1 tablespoon per glass of water). The places most vulnerable to trophic lesions are especially carefully processed: behind the ears, in the groin zones, on the back, sacrum, under the mammary glands. In order to prevent bedsores, as well as when their first signs appear (redness and peeling of the skin in sloping places), the skin should be wiped daily with disinfectants: camphor alcohol, lemon juice, irradiated with erythema doses of quartz.

A rubber circle covered with gauze should be placed under the affected areas on the back and lower back. In the developed bedsores (the presence of purulent blisters, small ulcers on the skin), it is necessary to treat them with a disinfectant solution, and then apply a bandage with synthomycin emulsion.



Fig. 3.1. Bedsore.

Bedsore (*apobiosis, necrosis*) is a dystrophic, ulcerative-necrotic changes in the skin, subcutaneous fatty tissue and even the periosteum, the development of which occurs as a result of disorders of local blood supply and innervation (Fig. 3.1.).

Personal hygiene. Patients with a free regimen independently perform personal hygiene procedures: washing, oral hygiene, taking a hygienic bath or shower.

Patients with bed rest are assisted in carrying out hygienic toilet by medical personnel. Washing is done with a soft washcloth with warm water. The patient's hands are washed with soap. The patient needs to wash the feet and cut the nails twice a week. Patients suffering from urinary and fecal incontinence should be washed several times a day to avoid irritation of the skin in the area of accumulation of physiological secretions. Before washing, a rubber or metal bedpan is placed under the sacrum, the patient's legs are bent at the knees and slightly parted in the thighs. With the left hand, on the genital area, a warm disinfectant solution is poured from the Esmarch mug (a pale pink solution of potassium permanganate or furacilin solution – 1:5000), with the right hand – with tweezers or forceps with a cotton swab, rub the skin in these places. Movements should be directed from the vagina (in women) / perineum to the anus so as not to introduce an infection into the urogenital system. Wipe the skin with a dry swab in the same direction.

Oral hygiene. In addition to daily morning toothbrushing using toothpaste, rinsing the mouth with water after each meal is recommended. For seriously ill patients, wipe the mouth with tweezers and a cotton swab dipped in 5% boric acid solution or 2% sodium bicarbonate solution. In the presence of the oral mucosa inflammations, additional irrigation with disinfectant solutions (microcide, furacilin) is carried out using a rubber bulb or a syringe without a needle. When dry crusts or cracks appear on the lips, a gauze napkin moistened with synthomycin emulsion is applied to the affected areas. Dry lips should

be lubricated with petroleum jelly or oil twice a day. To reduce bad breath, it is recommended to rinse periodically the mouth with 1% sodium chloride solution, or a dental elixir.

➤ The sequence of actions when carrying out the oral hygiene to a seriously ill patient who is in a state of consciousness.

Assist a seriously ill patient to wash the hands and serve a plastic tray. Provide it with one of the oral solutions and cotton or gauze swabs. With a moistened swab, the patient independently wipes the teeth, and then rinses the oral cavity.

➤ The sequence of actions when carrying out the oral hygiene to a seriously ill patient who is in a state of unconsciousness.

Lower the headrest of the bed, remove the pillow. The patient is transferred to a horizontal position so that the rinsing water does not enter the respiratory tract. An oilcloth or diaper folded in several layers is placed under the head. The patient's head is turned to the left. A plastic tray is placed at the corner of the mouth. The cheek is removed with a spatula. With a moistened gauze or cotton swab, which is held with a clamp, the teeth are processed from top to bottom from the outside and, if possible, from the inside. In the presence of plaque on the tongue, the tongue is partially pulled out using a tongue holder or a moistened gauze napkin and wiped with a swab moistened with an antiseptic solution that does not cause irritation. The oral cavity is irrigated with a warm solution from a rubber bulb or syringe. Dry the mouth and lips with a dry swab. In case of dryness of the mucous membrane of the mouth and tongue, they are treated with St. John's wort or sea buckthorn oil. Also use 10% borax in glycerin solution, any oil or butter. The oral cavity is treated twice a day.

➤ Sequence of denture handling.

Remove the removable dentures in a seriously ill patient. Wash thoroughly under running water and soap. Dentures are stored in a dry glass, which is covered with a gauze napkin. Before putting on dentures, rinse the mouth and dentures with water. In the case of stomatitis, an application from a solution of furacilin 1: 5000 or a decoction of chamomile for 3–5 minutes is used. The procedure is repeated several times a day. Periodically rinse the oral cavity with 2% sodium bicarbonate solution or isotonic sodium chloride solution.

Eye care. In the presence of secretions that stick together the eyelids, as well as with numerous eye diseases, eye care requires the use of special measures: rinsing the eyes, instilling medicinal drops in them and applying drugs on an ointment basis for the eyelids.

When the eyelids stick together, the eyes are cleaned with a sterile gauze swab moistened with 2% sodium bicarbonate solution, or 3% aqueous boric acid solution. The lower eyelid is pulled back with the finger of the left hand. After that, with the fingers of the right hand, 1–2 drops of eye drops are squeezed out of a sterile pipette, which are injected into the conjunctival sac located in the area of the inner corner of the eye (near the nose). The patient must close the eyes for a few seconds. The rest of the liquid is removed with a cotton swab.

Eye ointments are applied to the inside of the eyelid by pulling the eyelid down and injecting an ointment behind it. After that, the eyelid is released and gently, with circular movements of the fingers along the outer part of the eyelid, the drugs are rubbed along the mucous membrane of the eye.

Ear care. Inappropriate ear hygiene, especially in seriously ill patients, can cause various diseases and lead to hearing loss. Patients with bed rest should periodically clean the external auditory canals with a cotton swab. It is advisable to carry out the procedure after preliminary instillation of 2–3 drops of 3% hydrogen peroxide solution into the ear. It is also necessary to regularly wipe the skin of the back of the auricle, especially in the area of its transition to the mastoid process, in order to avoid the emergence of inflammatory processes in this place.

There are rules for instilling drops in the ear. First, the patient's head is slightly tilted to the healthy side, then the patient's earlobe is somewhat pulled back with the left hand, and at the same time the required number of drops are instilled into the ear with the fingers of the right hand using a pipette. After the introduction of drops into the external auditory canal, a dry cotton swab is inserted into it for several minutes.

Nose care. Seriously ill patients who cannot independently provide hygienic nasal care should daily free the nasal passages from crusts with a cotton swab moistened with oil or glycerin. Nasal drops are instilled

with a pipette: first into one nostril, and then into the second one. Instillation is carried out in a sitting or lying position of the patient with the head slightly thrown back.

Hair care. Patients who are on a free regimen carry out hygienic hair care on their own. Hair care includes washing the hair weekly with warm water and soap or shampoo and brushing the hair regularly. Seriously ill patients are provided with hygienic hair care by medical personnel. The patient is given a haircut once every 7–10 days, followed by shampooing. Every day the hair on the patient's head is combed with an individual comb.

UNIT 4

The role of questioning (identifying patient's complaints) in assessing the overall condition of a patient (anamnesis, medical history)

Subjective examination consists in obtaining, by questioning, from the patient information about his/her illness and the factors that caused it. The questioning / anamnesis consists of the following sequential sections:

- 1) personal data;
- 2) the patient's complaints;
- 3) anamnesis / medical history;
- 4) anamnesis / life history.

Anamnestic data are recorded in the patient's medical record – a medical history in a hospital or a medical record of an outpatient when the patient visits polyclinic.

Personal data. Consistently find out: last name, first name, patronymic, age, gender, marital status, education, profession, place of work, position; in case of disability – the reason, date of establishment of disability, group; for persons of retirement age – the date and reason for retirement (age, illness); place of residence (address), contact phone number; the date of admission to the hospital, especially hospitalization (on personal initiative, on the referral of a polyclinic doctor, by an ambulance, on referral from another department, etc.).

Complaints are the patient's subjective feelings about his/her illness. There are major complaints and minor / general complaints.

- The major complaints indicate the emergence of an illness (pain, cough, shortness of breath, palpitations, constipation, diarrhea, nausea,

vomiting, impaired vision, hearing, etc.), as well as signs of illness, in connection with which the patient consulted a doctor.

- Minor / general complaints do not always indicate a specific disease or a disease of a specific body system; however, they can accompany other similar pathologies, complicate and aggravate the course of the underlying disease. These include: general weakness, psychoemotional imbalance, decreased performance, sleep disturbance, discomfort, increased or decreased body temperature, chills or fever. Minor complaints may indicate concomitant diseases of the patient.

Anamnesis (from Latin anamnesis – mention, recollection) is information received from a patient about his/her illness: facts, events, factors and circumstances that led to the onset of the disease and its development.

Anamnesis morbi is a structural part of the anamnesis, aimed at establishing the features of the evolution of the disease from its initial manifestations to the moment the patient meets the doctor. The purpose of collecting anamnesis of the disease is to establish the characteristics of the course of the disease, the frequency of complications, the effectiveness of therapeutic measures. The data of the anamnesis of the disease are recorded in the history of the disease in chronological order, from the moment of the emergence of the initial manifestations of the disease to the stage of the initial examination of the patient by the doctor (duty physician or physician in charge) of the inpatient unit.

First of all, they find out the nature of the onset of the disease: the sudden onset or slow development, the sequence of the emergence of the symptoms of the disease and their nature, the time of the patient's seek for medical help regarding the emergence of the first signs of the disease, the methods of providing and the effectiveness of care, the types of treatment measures used by the patient before contacting to the doctor.

Then the features of the course of the disease are found out: periods of exacerbation, remission, dynamics of symptoms, timing and probable causes of the emergence of new signs of the disease, the results of diagnostic studies, methods and effectiveness of the treatment (inpatient, outpatient, sanatorium). For this purpose, medical documentation is used: extracts from previous medical records, an outpatient card, a

health resort book, copies of certificates of laboratory and instrumental research methods.

Anamnesis vitae are patient's life history, reflecting the patient's medical history. The main goal of the physician during the clarification of the life history is to assess the patient's living conditions, their influence on the onset and course of the disease, to have an idea of the presence of a hereditary predisposition to diseases, risk factors for the development of the disease. The life history includes information about the conditions of job activity (working hours, contact with hazardous substances, work in a dusty, cold room, etc.), everyday life (living conditions, rest, sleep), the patient's dietary habits. An important aspect is the establishment of information about previous illnesses, operations and injuries, information about infectious diseases that happened throughout life.

It is important to find out the **family history** – the illness of the patient's closest relatives. If both parents suffer from diabetes, then the patient may have this disease in a latent form. Cancer in the family causes cancer alertness.

It is important to investigate the **allergic history**. For example: the presence in the past history symptoms of itching, urticaria, angioedema, diarrhea; suffocation attacks when eating certain foods, contact with perfumes, pollen, animal hair and other allergens. It is necessary to find out whether the patient is allergic to medications. When establishing the fact of allergy, these drugs should not be prescribed.

During the questioning, it is important to find out whether the patient has bad habits: smoking, alcohol abuse, drug use. A conversation with a patient should be carried out taking into account the level of his/her intellect, general culture, education. When working with unconscious patients, the conversation about the medical history and life should be carried out with the patient's relatives.

The information that the patient reports about his/her illness and his/her life history are recorded in the medical history. A **medical history** is an important medical document that reflects everything that happens to a patient during examination and treatment. The information the patient gives about his or her illness and life history is recorded in the medical history.

There is a generally accepted **layout of the medical history**:

1. Personal data.

2. Data obtained during the questioning:

a) complaints;

b) medical history;

c) life history.

3. Data of the objective examination:

a) general inspection;

b) detailed inspection;

c) examination (examination, palpation, percussion, auscultation)

by organ systems: respiratory system, cardiovascular system, digestive system, urinary system, endocrine system, neuropsychic sphere.

4. Preliminary diagnosis.

5. Plan of the laboratory tests, X-ray and instrumental studies, consultations.

6. Treatment plan.

7. Results of additional survey methods.

8. Clinical diagnosis and its rationale.

UNIT 5

The role of the physical examination in the assessment the general condition of a patient

Examination of a patient is the simplest and most natural mode of study, with the help of which it is possible to objectively assess the actual condition of the patient. The presence of pathological signs that are visible at the first examination, when the patient just enters the office, provide significant assistance with questioning and sometimes allow to make the correct diagnosis «at the first sight» (for example: changes in facial features with hyperthyroidism, «spider veins» with cirrhosis of the liver and etc.). During examination, during mutual study, mutual understanding and trust is formed between the physician and the patient.

A plan for conducting a general examination of the patient to assess the following:

➤ **Assessment of patient general condition**, which can be: good, fair, serious and critical (Fig. 5.1).

Good condition is characterized by moderately painful manifestations of the disease, a slight deterioration in well-being, an active position in bed.

Fair condition is marked by deterioration in well-being, significant disorders of organs and systems, a decrease in working capacity, and unfavorable dynamics of the course of the disease.

A **serious condition** is manifested by significant manifestations of the pathological process, the forced or passive position of the patient in bed, disorders of the basic functions of the body: breathing, blood circulation, urination, the activity of the digestive and nervous systems.

A serious condition can be manifested by loss of consciousness, coma, and crisis course of the disease.

Critical condition is characterized by a complicated course of the disease and can be fatal. This condition is characterized by dramatic deterioration in the activity of vital organs and systems, a passive or forced position of the patient in bed, loss or clouded consciousness, coma.

During general examination, it is important to assess the compliance of the patient's appearance with the patient's passport age. Indeed, with some diseases (mitral stenosis, early stages of tuberculosis), patients look younger, but with cachexia, atherosclerosis, long-term debilitating diseases, they look older.

➤ **Assessment of the state of consciousness.** Consciousness can be clear and impaired. Depending on the degree of the disorder of consciousness, there are:

1) **Stupor** (a stunned condition). The patient is poorly oriented in the environment, answers questions with a delay. A similar condition is noted with contusions, some poisoning.

2) **Sopor or hibernation**, from which the patient comes out for a short time with a loud call or pulling about. Reflexes are saved. A similar condition can be observed with infectious diseases and with impaired renal function in the terminal stage.

3) **Coma** is a fainting state characterized by a lack of reflexes and a disorder of vital centers. The most common types of coma are: alcoholic, hypoglycemic, hepatic, uremic, epileptic.

If the patient is active, can move independently, pay attention to the posture and gait. Erect posture, fast and confident gait indicate that the patient's health is not significantly affected.



Fig. 5.1. Assessment of patient general condition [70].

➤ **Gait. Gait features are of great diagnostic value.**

A healthy adult has a clear, confident, uniform gait. In some diseases, the gait acquires specific, sometimes pathognomonic features for a particular disease. Distinctive features have an **ataxic gait**: the patient raises the feet high when walking, excessively bending the legs at the knee and hip joints, and noisily lowers the feet to the floor, such a gait is typical for patients with polyneuritis. **Parkinsonian gait** is characterized by short, jerky movements with the trunk leaning forward. This gait often occurs in patients with Parkinson's disease. **Spastic gait** is observed with paralysis of half of the trunk (hemiplegia) in patients after cerebral hemorrhage / stroke, therefore, as a result of increased muscle tone, the gait is excessively slow and tense. Patients may also have other gait changes that have significant prognostic value. A peculiar change in gait can occur in old age, called a **senile gait**. It is characterized by the appearance of small, sometimes irregular steps (due to increased muscle tone of the lower extremities). The gait also changes in some diseases of the musculoskeletal system. Due to intense joint pain, gait is often difficult. A **lame gait** can be observed with a dramatic decrease in blood circulation in the legs and feet with obliterating endarteritis (intermittent claudication). **Too slow gait** with an immobile or slightly bent trunk appears with severe lower back pain due to spondyloarthritis, with spondyloarthrosis, ischiuradiculitis. The gait with tense toes and bent legs or the «**ballerina**» **gait** is characteristic of hypovitaminosis C (scurvy), complicated by intramuscular hemorrhage.

➤ **Position in bed.** The following patient positions in bed are distinguished:

Active, when the patient freely changes position depending on his/her needs: lies down, sits down, gets up, straightens the pillow.

Passive, a position that is determined exclusively by the law of gravity: if a hand accidentally hangs from the bed, then it continues to remain in this position; the head is pressed into the pillow, the muscles are relaxed; the patient cannot independently change the position in bed, although it can be extremely uncomfortable. Such position is typical of very weak and helpless patients or in an unconscious state.

Forced, a position that the patient instinctively or consciously takes in certain diseases in order to alleviate suffering. A forced position

can be: half-sitting in bed or in a chair with legs lowered to the floor (orthopnea) with shortness of breath of cardiac origin: this position facilitates the movement of the diaphragm, improves the outflow of venous blood and a decrease in the amount of circulating blood. Sitting or standing position, fixing the hands on a stationary object (window sills, table, bed) is taken in case of an attack of bronchial asthma. Patients with meningitis assume a position on their side with their legs drawn to the stomach and their head thrown back (the pose of a «cop dog»); knee-elbow (from the French «a la vache» – «like a cow») is taken in case of exacerbation of peptic ulcer with an ulcer located on the posterior wall of the stomach; «Bedouin who prays» position is taken in exudative pericarditis. Forced position on the back can be taken by patients with intense pain in the abdomen, for example, with peritonitis, purulent appendicitis. In pneumonia, pulmonary tuberculosis, patients lie on the affected side in order to release a healthy lung for breathing as efficiently as possible; position on the affected side also reduces the cough reflex from the affected area of the lungs. A forced position on the right side is often observed in patients with heart failure due to significant dilatation (expansion) of the cavities of the heart: this position helps to facilitate the contractile activity of the left ventricle.

A passive-forced position can be prescribed by a physician with the aim of a more favorable course of the disease, namely, in myocardial infarction, on the back, with a slightly raised head end of the functional bed; in left-sided exudative pleurisy – on the right side, with a slightly raised head; in a supine position, with a slightly lowered head and raised legs, a patient is placed in case of fainting.

In addition to the sequence of the general examination, state of consciousness, assessment of the patient's position in bed, posture and gait, the skin, mucous membranes, subcutaneous tissue and muscles of the supporting apparatus are examined.

➤ **Skin.** Examining the condition of the skin, pay attention to the color of the skin, its moisture, turgor, the presence of puffiness, the condition of the venous network, hair-covering, the presence of hemorrhages in the skin, rash, scars.

Skin color. Skin color assessment is best done in daylight. Normal skin color is pale pink. Skin pallor may be caused by anemia. Pallor



Fig. 5.2. Skin and sclera color in jaundice.

of the skin without anemia can be observed with spastic contraction of skin vessels (dizziness, nausea). Redness of the skin is observed with a significant increase in the level of hemoglobin and red blood cells in the blood. Temporary redness of the skin is observed after exposure to the sun, after hot baths, with an increase in blood pressure. In all cases, the cause of the discoloration of the skin is the dilatation of the skin vessels caused by vasomotor effects. Cyanosis is most often caused by respiratory failure or diseases of the cardiovascular system. Jaundice depends on the deposition of the bile pigment bilirubin in the skin and mucous membranes (Fig. 5.2).

Bronze coloration is observed in Addison's disease. The cause of pigmentation is associated with hypersecretion and an increase in the activity of the melanoform hormone of the pituitary gland. There may be a complete absence of pigment (albinism) or partial loss of pigment in certain areas of the skin in the form of white spots.

Skin moisture. Normally, the skin is moist, which depends on the constant release of microscopic drops of sweat on the skin surface.

Excessive skin moisture is observed with excessive sweating, for example, at high ambient temperatures; when using a large amount of liquid in a short period of time; in heavy muscle work; in a critical drop in body temperature in patients with pulmonary tuberculosis, especially at night; in severe inflammatory diseases (tuberculosis, endocarditis).

Dry skin is observed when the body loses fluid, if the patient has vomiting, diarrhea; in excessive excretion of fluid from the body by the kidneys, for example, in diabetes mellitus, as well as in suppressed function of the sweat glands, for example, in administration of atropine, in hypothyroidism.

Skin turgor, that is, its tension, elasticity. It is assessed mainly by palpation, for which two fingers take the skin into a fold. At the same time, in the case of normal tone, it is felt that the skin is dense, but elastic, has sufficient thickness, does not separate from the subcutaneous tissue and instantly straightens after removing the fingers. Skin turgor

depends on the degree of subcutaneous tissue development, the fluid content in the skin, the degree of blood supply and the condition of the skin colloids. A decrease in turgor is of diagnostic value, depending on thinning of the skin, which is associated with a decrease in its blood supply and changes in the colloidal properties of its elements, leading to a loss of elasticity.

Edema. Depend on the accumulation of fluid in tissues and tissue crevices. Edema can occupy individual parts of the body or capture the subcutaneous tissue of the entire body. Severe edema can be detected by pressing a finger on the swollen places of the skin covering the bone formations (in the area of the outer surface of the lower leg, ankle, lower back, etc.) in the presence of edema after removing the finger, a fold remains, which disappears after 1–2 minutes (Fig. 5.3).



Fig. 5.3. Edema in the lower extremities.

Skin rash and hemorrhage. Rash that can occur in internal diseases: erythema, roseola, urticaria, papule, pustule, vesicle, hemorrhages and petechiae, telangiectasia, scratching, «spider veins», «blood drops». In addition, attention should be paid to scars and their origin (postoperative or after injury), as well as trophic changes in the skin (bedsores, ulcers).

A rash on the skin can occur with some acute or chronic diseases of the body. According to morphological signs, skin rashes have different manifestations: erythema is limited redness; petechiae are punctate capillary cutaneous hemorrhages; macula is limited spot; papule is a nodular formation that does not have a cavity, somewhat rising above the surface of the skin; roseola is a rash on the skin in the form

of small red spots that do not protrude above its surface; vesicle is a small thin-walled formation on the skin, filled with serous fluid; abscess is a bubble-like formation on the skin filled with pus; blister is a bubble-like formation of a large size on the skin; hives are itchy plaques that look like a nettle burn (blisters); erosion is a skin defect within the epidermis; excoriation is an abrasion resulting from mechanical damage to the skin due to scratching, characterized by the formation of erosion; crack is a linear defect that occurs due to loss of elasticity and infiltration of certain areas of the skin; an ulcer is a deep defect in the skin that affects the subcutaneous tissue and deep tissues.

The presence of rash and its features are of great diagnostic value and different semiological significance, especially for various infectious, skin and childhood diseases (e.g. rash fevers as measles, rubella, scarlet fever, smallpox, as well as red and typhus, syphilis, etc.).

Hair-covering. The type of hair growth, hair loss, graying, hypertrichosis should be assessed.

Nails. Their shape is assessed (for example, in the form of an «hour glass» in lung diseases), as well as fragility, color, outlines of nails.

Subcutaneous tissue. When evaluating the subcutaneous tissue, attention is paid to the degree of its development and the uniformity of deposition in various parts of the body. The development of subcutaneous tissue is assessed by the thickness of the subcutaneous fold. The greatest diagnostic value is its assessment in the hypochondrium (right or left) at the level of the navel. Normally, the thickness of this fold is about 2 cm. A thickness of less than 1.5 cm indicates a reduced degree of fatness, and more than 2 cm – an increased one. Accurate data on the state of nutritional status can be obtained by determining the body mass index (BMI).

➤ **Lymph nodes examination.** Examination and palpation of the lymph nodes is important.

Normally, the lymph nodes are not visible or palpable. When palpating the nodes, attention is paid to their size, consistency, clarity of separation from the surrounding tissues, soreness, mobility, the color of the skin above them and the nature of their location (one at a time or crowding from several nodes). Most often, the cervical, supraclavicular, subclavian, axillary, elbow and inguinal lymph nodes are enlarged. Examination

of the lymph nodes is carried out in the following sequence: occipital, posterior cervical, parotid, auricular, submaxillary, submandibular, mental, anterior cervical, supraclavicular, subclavian, axillary, ulnar, inguinal, popliteal.

➤ **Skeletal muscles.** The degree of development of skeletal muscles should be assessed: good, moderate, weak, local hypertrophy, atrophy.

The condition of the muscles is assessed visually, by palpation and their strength is checked. Palpation reveals muscle tone, which can be maintained, decreased or increased. The presence of cramps is of diagnostic value. Altered consistency of the muscle and its sharp soreness occurs in acute inflammation of the muscle or hemorrhage in the muscle tissue.

➤ **Bones/Bone apparatus.** The condition of the spine is assessed (curvature, limitation of mobility). Subsequently, examination of the extremities is carried out. The proportionality of their sizes, distortion, the condition of the terminal phalanges of the fingers and toes is assessed. The condition of the joints, their configuration, mobility, swelling, soreness, the presence of a crunch during movement is assessed.

The concept of physique consists of data on: the height, fatness, body shape, degree of development and muscle tone, and skeletal structure. Anthropometric studies of the parameters of a person's physical development must be carried out, which include measurements of height, body weight, chest and abdominal circumference, which are described in details in Section 3 (3.1).

➤ **Statical types.** Data on the physique of the patient, his/her fatness, muscle development, the results of measuring the height and circumference of the chest, weighing the body make it possible to assign him/her to one or another statical type.

The physical build is understood as the sum of partially inherited, partially acquired morphological and functional characteristics of a person. Three constitutional types are distinguished: *normosthenic*, *asthenic* and *hypersthenic* (Fig. 5.4).

The average normosthenic type occurs most often. People belonging to the asthenic type are distinguished by the following morphological features: they have significantly enlarged longitudinal body dimensions; the chest is narrow and flat; the neck is narrow and long, the extremities

are long and thin; the skull is elongated, the face is narrow; plentiful hair-covering; the muscles are flabby and thin; soft, thin, dry skin with veins that are slightly translucent, the subcutaneous fat layer is poorly expressed; the shoulders are narrow and sloping. People belonging to the hypersthenic type have transverse dimensions that are much larger than those of asthenics, therefore they are stocky; the chest is wide and deep; neck, extremities are short and wide; the skull is wide and low, the face is round and wide; the muscles are developed, but not always elastic; the subcutaneous fat layer is well developed; shoulders are straight and wide; there is a tendency to early baldness; the diaphragm, unlike asthenics, stands high.

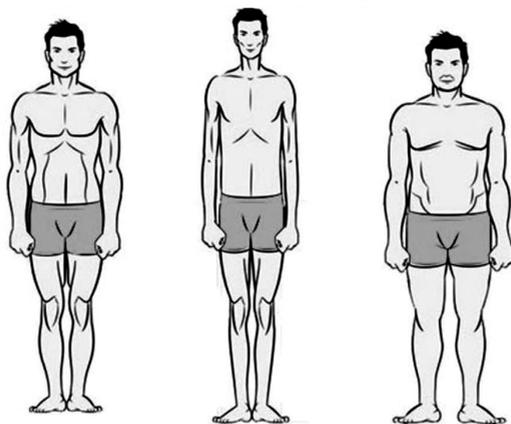


Fig. 5.4. Statical types: normosthenic, asthenic and hypersthenic.

➤ **Body mass index** is a value that allows to assess the correspondence of a person's body mass and height, and thereby indirectly assesses whether the body mass is insufficient, normal or overweight.

The correspondence between the weight, height of a person and his/her body mass index is usually assessed as follows (Table 2): Body mass index (BMI) is calculated using the formula:

$$I = \frac{m}{h^2},$$

where, m – body mass in kilograms; h – height in meters; I – is measured in kg/m^2 .

Table 2.

Clinical assessment of the body mass index.

Body mass index	Correspondence between the weight and height of a person
15 and lower	Acute underweight
15–18,5 (sometimes 15–20)	Underweight
18,5 – 25	Norm
25 – 30	Overweight
30 – 35	First degree obesity
35 – 40	Second degree obesity
40 and greater	Obesity of the third degree

The data of the performed anthropometric data during the examination of the patient is recorded in his/her medical history (*see Section 3 (3.1)*).

UNIT 6

Body temperature, rules of its measurement and registration. Care of patients with fever

When assessing the state of human homeostasis, a constant body temperature is normally recorded, which does not depend on the ambient temperature. Body temperature is the result of thermoregulation processes, which are ensured by the achievement of equilibrium between the processes of heat generation and heat transfer.

The normal body temperature of a healthy person in the groin fold is 36.4–36.9°C, in the oral cavity – 37.1–37.3°C, in the rectum and vagina – 37.3–37.5°C. The maximum body temperature that a person can tolerate is in the range of 42–43°C. The minimum body temperature that a person can tolerate is 28°C. During the day, the body temperature of a healthy person can fluctuate up to $\pm 1^\circ\text{C}$. The highest body temperature is at 16.00–18.00 hours, the lowest is at 3.00–6.00 hours.

The upper limit of the normal temperature, measured in the armpit, should be considered 36.9°C, in the vagina – 37.5°C.

The lower limit of normal body temperature in the armpit should be considered 36.0°C, in the rectum and vagina – 36.8°C.

Hyperthermia is an increase in body temperature above the specified maximum values. *Hypothermia* is a decrease in temperature below minimum values.

Body temperature indicators depend on the type of nutrition, physical activity, ambient temperature, the emotional state of a person, age, periods of the menstrual cycle in women (body temperature rises and can be 36.9–37.1°C). In the warm season, the body temperature can be 0.1–0.3°C higher than in winter.

An assessment of the relationship between body temperature and pulse rate is important. Usually, when the body temperature rises by 1°C,

the pulse rate accelerates by 8–10 beats per minute. The acceleration of the pulse that is inappropriate to high body temperature may indicate the presence of typhoid fever, meningitis, encephalitis.

In Ukraine, the temperature scale is Celsius. At the same time, in many countries, body temperature is measured in Fahrenheit.

6.1. Thermometers and body temperature measurement

Mercury thermometer (Fig. 6.1). Measurement of body temperature is carried out using a medical thermometer with a scale from 35 to 42 degrees Celsius with divisions of 0.1°C. To reduce the level of mercury in the capillary, the thermometer must be shaken several times.

Electronic thermometer (Fig. 6.2), like a mercury thermometer, is designed to measure body temperature by contact, that is, physical contact is needed between the patient's body and the temperature sensor.

Liquid crystal thermometer (Fig. 6.3). Its operation is to change the color of liquid crystals as the temperature changes. It is a polymer plate coated with a liquid crystal emulsion. To measure body temperature, the plate is applied to any part of the body. At a temperature of 36–37°C, the letter «N» («Norma») is highlighted on the plate in green, and at temperatures above 37°C – «F» («Febris» – fever).

Infrared ear thermometer (Fig. 6.4). A funnel-shaped tip is put on the thermometer and carefully inserted into the ear canal for 1–2 minutes. The thermometer works with an infrared sensor to assess the temperature of the tympanic membrane.



Fig. 6.1. Mercury thermometer.



Fig. 6.2. Electronic thermometer.



Fig. 6.3. Liquid crystal thermometer.



Fig. 6.4. Infrared ear thermometer.

➤ Measurement of body temperature.

The body temperature is measured twice a day – in the morning between 7.00–9.00 hours and in the evening between 17.00–19.00 hours. In some cases (if it is necessary to detect rheumatism, tuberculosis), the body temperature is measured every 2–4 hours. Usually body temperature is measured in the armpit.

Algorithm for assessing body temperature in the armpit:

- check the mercury level in the thermometer. If the mercury is above 34°C, shake the thermometer several times and check the mercury level again;
- the skin in the armpit should be dry. If the skin is damp, dry it off with a towel;
- place the end of the thermometer with a reservoir of mercury in the armpit and ask the patient to press the arm bent at the elbow to the body. Keep in this position for 8–10 minutes;
- record the temperature readings into the temperature sheet;
- disinfect the thermometer.

Algorithm for measuring the temperature in the rectum:

- place the patient on his/her side;
- lubricate the thermometer reservoir with petroleum jelly;
- insert the reservoir of the thermometer behind the rectal sphincter;
- after 5 min assess the reading of the thermometer;
- record the temperature readings into the temperature sheet;
- disinfect the thermometer.

➤ **Thermometer disinfection.**

1. **Individual thermometer.** After measuring the temperature in the mouth, wipe twice with a napkin moistened with 96% ethyl alcohol, disinfect in 3% solution of hydrogen peroxide.

2. **Medical thermometer.** After measuring the temperature in the mouth, soak completely in a horizontal position, after placing a layer of cotton wool so as not to break the reservoir with mercury, in a container with one of the disinfectants:

- 3% hydrogen peroxide solution – 80 min.
- 2.7% Deseffect solution – 30 min.
- 1% chloramine solution – 15 min.

3. Medical thermometers, after rectal temperature measurement, soak for 60 minutes in 3% chloramine solution, then wash with soap and water and rinse under running water.

4. After use in the infection ward at a hospital or in patients with tuberculosis, medical thermometers should be soaked in 5% chloramine solution for 60 minutes.

6.2. Evaluation of body temperature measurements

Registration of body temperature readings. After daily measurement of body temperature, the results are recorded in a temperature sheet, which is provided for each patient, graphically in the form of a curve. The date of registration of temperature, temperature readings in the morning and evening is recorded.

After each measurement, points connected by straight lines are marked at the corresponding level of the sheet of the temperature grid.

The resulting curve line displays fluctuations in body temperature over the period of observation of the patient.

The temperature curve is a graphical representation of the fluctuations in the patient's body temperature during daily measurements.

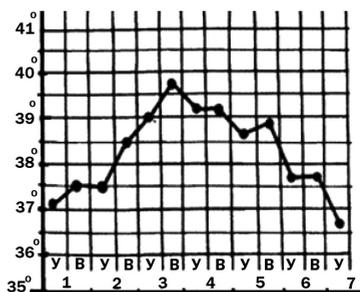


Fig. 6.5. Sample of the temperature curve.

The temperature curve is a valuable source of information, as it gives a visual representation of the course of the disease and has significant diagnostic and prognostic value in the course of treatment.

Depending on the degree of temperature rise, a distinction is made between:

- subnormal temperature: 35.0°C to 35.9°C;
- normal temperature: 36.0°C to 36.9°C;
- subfebrile temperature: 37°C to 38°C;
- moderately elevated (febrile) temperature: 38°C to 39°C;
- high (pyretic) temperature: 39°C to 41°C;
- extremely high (hyperpyretic) temperature – greater than 41°C (life threatening).

6.3. Fever. Care of patients with fever

Fever is a pathological process characterized by a violation of thermoregulation processes and an increase in body temperature. The reason for the increase in body temperature can be: infectious diseases; non-infectious agents in administration of serums, blood, blood-substituting protein preparations.

Depending on the duration of the temperature fever can be:

- ***fast-passing*** – lasts for several hours (occurs in flu, ARVI);
- ***acute*** – lasts up to 2 weeks (typical for acute bronchitis, pneumonia);
- ***subacute*** – lasts for 15–45 days (typical for rheumatism in the acute stage, chronic bronchitis);
- ***chronic*** – lasts more than 45 days (typical for tuberculosis, chronic tonsillitis, sepsis).

Temperature curves are a graphical representation of temperature fluctuations during daily measurements. Temperature curves give a clear idea of the nature of the fever; they often have significant diagnostic and prognostic value.

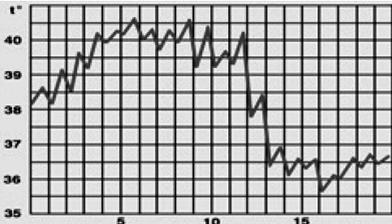
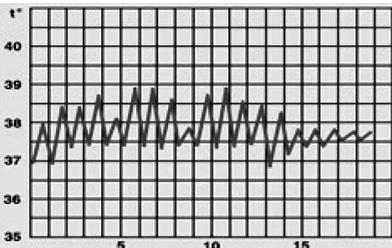
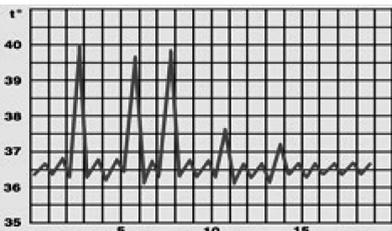
The nature of the temperature curve can be influenced by the characteristics of the pathogen, the cyclicity of its development in the blood, the state of the patient's body, the ability of the immune

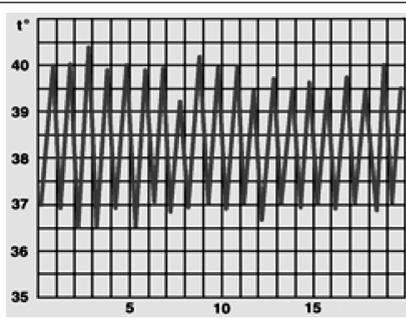
system to respond to foreign antigenic stimuli. Recently, as a result of the widespread use of antibiotics, the temperature curves have largely lost their typicality.

The types of temperature curves make it possible to distinguish the following types of fever (Table 3).

Table 3.

The types of temperature curves

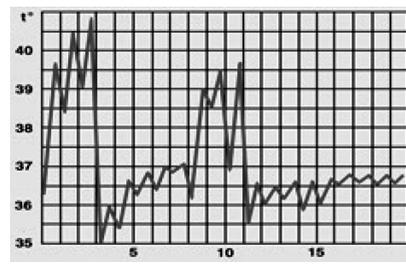
Characteristics of the temperature curves of patients with fever	
Types of temperature curves	Types of fever
	<p>Sustained fever. The body temperature is set at high numbers, its daily fluctuations are minor (no more than 1° C). It is observed in croupous pneumonia, typhoid fever.</p>
	<p>Remittent fever. It is characterized by the difference between morning and evening temperatures in the range of 1–2°C, sometimes more. It does not drop to normal in the morning. Typical for pustular diseases, focal pneumonia.</p>
	<p>Intermittent fever. There is a periodic (from 1 to 3 days) increase in temperature for several hours, followed by its decrease to a normal level. Typical for malaria.</p>



Hectic (exhaustive) fever.

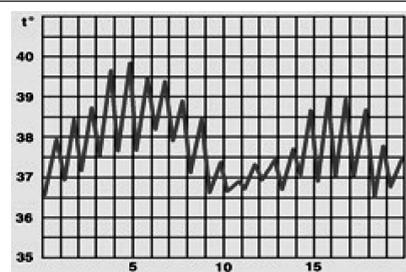
Prolonged fever with daily temperature fluctuations in the range of 4–5° C, with an increase to 40–41°C in the evening and at night, and a morning drop in temperature to subfebrile and normal values. It is observed in sepsis, pustular diseases, active tuberculosis with the decay of lung tissue.

Inverted fever. Similar to hectic one, but the maximum temperature is observed in the morning, and in the evening it drops to normal or subfebrile values.



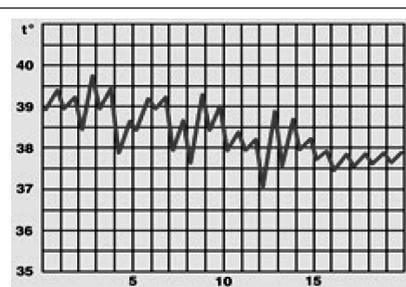
Relapsing fever.

The alternation of multi-day febrile periods with febrile ones is characteristic. Typical for recurrent fever.



Undulating fever.

A gradual increase in temperature is characteristic for a certain time, followed by a lytic drop and a more or less febrile period. It is characteristic for lymphogranulomatosis, brucellosis.



Rheumatic fever.

It is characterized by an indefinite duration with irregular and varied daily fluctuations in body temperature in the form of sustained, remittent, intermittent, relapsing and other fevers and their various combinations. It is observed in rheumatism, chronic bronchitis.

Care for patients with fever.

- In clinical practice, three main periods of fever are distinguished:
- rise;
- maximum rise;
- decrease in temperature.

Each of these periods has its own clinical picture; therefore, patient care during these periods is characterized by its own characteristics.

During the period of temperature rise, heat production prevails over heat transfer. The duration of this period can be several hours, several days or even weeks. With a rapid rise in temperature, the patient condition is the most severe; this is associated with chills, pains and aches throughout the body. The patient needs to be warmed: cover, overlay with heating pads and give hot drinks (tea, coffee). Due to a decrease in appetite in a seriously ill patient, food is often given to patients (6–7 times a day) during periods when the temperature is dropping.

During the period of the maximum temperature rise, it is important for the patient to intake as much liquid as possible, especially since patients during the period of fever are thirsty and willingly drink. Adequate consumption of liquid in large quantities promotes vigorous excretion of harmful substances not only through the kidneys, but also through the skin and mucous membranes (the patient sweats profusely). A nurse is obliged to be maximally attentive to the patient. It is especially important to take care of the patient's skin during the period of enhancement of its excretory function (timely change of linen, rubdown, prevention of bedsores).

Damage to the nervous system in fever is manifested by headache, insomnia, and increased fatigue. When caring for patients with fever, the increased attention of medical personnel is required. Cold is applied to the head to relieve headaches.

Caring for the oral hygiene of a patient with fever consists in wiping the teeth and moistening the oral cavity, after which the cracks in the lips and tongue are lubricated with Vaseline oil.

Disorders of bowel function may occur, manifesting by constipation, diarrhea.

Disorders of the cardiovascular system and respiration are possible: a decrease in blood pressure and an increase in pulse rate and respiration in accordance with the level of temperature rise. A nurse, according to the readings of pulse and respiration, should be able to assess the severity of the patient's condition and report all symptoms to the doctor.

With a rapid decrease in temperature below the normal level, there may be a sudden sharp deterioration of the patient's condition: weakness, thirst, a feeling of cold and chills. Skin pallor is noted, the skin becomes covered with cold sweat, the hands and feet become cold. There is a decrease in blood pressure, the pulse is fast, breathing also accelerates and becomes shallow, the pupils dilate. Acute vascular insufficiency (collapse) may develop.

A patient with the **development of a state of collapse** is provided with emergency medical care. Medical personnel must estimate the emergency by the patient's appearance, the results of a general examination, heart rate, respiratory rate, patient behavior, and report the emergency to the doctor. It is necessary to warm the patient with heating pads and give him/her a warm drink. When the patient's condition improves, he/she is wiped off with wet wipes and linen is changed.

UNIT 7

Assessment of basic hemodynamic and respiratory indices

7.1. Pulse assessment and characteristics

The pulse is assessed by fluctuations in the walls of the arteries due to the flow of blood in the vessels of the human body and changes in pressure in the vessels during the contraction of the heart. The main characteristics of the pulse depend on the work of the heart and the elasticity of the vascular walls. The characteristics of the pulse of a healthy person can change with psychoemotional arousal, physical exertion, changes in the temperature of the external environment, exposure to medications, alcohol intake.

Pulse is examined by palpation in the places of superficial placement of the arteries. The pulse is assessed on the arteries: carotid, temporal, femoral, subclavian, brachial, radial, popliteal, posterior tibia and arteries on the back of the foot. Usually, the pulse is assessed by palpation on the radial artery between the styloid process of the radial bone and the tendon of the internal radial muscle (Figure 7.1).



Fig. 7.1. Pulse examination by palpation.

The examination starts with an assessment of the symmetry of the pulse by assessing its characteristics simultaneously on both hands. During examination, the patient's hands are located at the level of the heart. The medical professional takes the patient's hands in the area

of the wrist joint with his/her thumb outside and below, and puts the ring, middle and index fingers on top. Feeling a pulsating artery, he/she moderately presses it against the inner surface of the radius. If the pulse is the same on both arms, the examination is continued on one arm. **Assess the rhythm, rate, tension and strength of the pulse, its magnitude and mode.** If a difference is detected in the strength of the pulse between the right and left arms (developmental anomalies, narrowing or squeezing of one of the arteries), the examination is carried out on the radial artery where the pulse waves are clearer.

The pulse rhythm is assessed by the regularity of the pulse waves that occur one after the other. If the pulse waves appear at regular intervals, this indicates the correct rhythm (rhythmic pulse); at different intervals between pulse waves means that the rhythm of the pulse is incorrect (not rhythmic, arrhythmic pulse). In a healthy person, the heart beats rhythmically, with equal intervals between pulse waves. Sometimes they find respiratory arrhythmia – an increase in the pulse during inhalation and a slowdown during exhalation, which disappears when the breath is held.

Pulse rate is the number of pulse fluctuations in 1 minute, which depend on the activity of the heart. In a healthy person, the number of pulse waves corresponds to the heart rate and is 60–80 per minute. The study of the pulse rate is usually carried out for 30 seconds and the resulting number is multiplied by 2. In the case when an arrhythmic pulse is recorded, it is counted within one minute. A pulse rate of more than 90 beats per minute is called tachycardia, and a pulse rate of less than 60 beats per minute is called bradycardia.

The pulse rate of a healthy person depends on many factors: age (the highest pulse rate is in the first years of life); gender (in women, the pulse per minute is 5–10 beats more often than in men); in physical exertion and mental states (fear, anger, pain) the pulse accelerates, and during sleep it slows down.

In pathological conditions, the cause of tachycardia may be an increase in body temperature (an increase in body temperature by 1°C accelerates the pulse by 8–10 beats per minute). Bradycardia is observed in patients who recover from severe infectious diseases, brain diseases with damage to the cardiac conduction system.

Pulse tension is the degree to which the artery wall resists finger pressure. Pulse tension depends on the blood pressure in the artery, due to the activity of the heart and the tone of the vascular wall. In diseases that are accompanied by an increase in the tone of the arteries, for example, hypertension, it is difficult to squeeze a vessel and such a pulse is called tense or hard. With a dramatic decrease in pressure in the vessels during collapse, the pulse is soft (a slight pressure on the artery is enough and the pulse disappears).

Pulse strength is the degree of artery filling with blood during the period of heart systole, and depends on the amount of cardiac output, that is, on the amount of blood that the heart throws into the vessels during its contraction. To assess the pulse filling, first press the proximally located finger on the artery wall so that the distally placed finger can determine the nature of the artery at the moment when it is not filled with blood, and then stop pressing with the proximal finger and get a palpation sensation at the moment of maximum filling of the artery with blood. According to the degree of filling of the artery, a full and empty pulse is distinguished. In the case of good filling, a high pulse wave is felt under the fingers, and in the case of poor filling, a low pulse.

Pulse magnitude. The magnitude of the pulse thrust combines the strength and the tension of the pulse. It depends on the degree of dilatation of the artery during systole and on its fall during diastole, which in turn depends on the strength of the pulse, the magnitude of the pressure fluctuations in the vessels and the elasticity of the vessels. With an increase in the stroke volume of blood, a significant fluctuation in pressure and a decrease in the tone of the artery wall, the magnitude of the pulse wave increases and the pulse becomes large or high. A decrease in the stroke volume of blood, low amplitude of pressure fluctuations, and an increase in the tone of the artery wall reduce the magnitude of pulse waves – a weak pulse. In acute heart failure, shock, significant blood loss, the pulse value becomes so insignificant that it can hardly be assessed – it is a thready pulse.

The mode (velocity) of the pulse is the rate of change in the volume of the artery, which is assessed by palpation. Rapid stretching of the

artery wall and the same rapid contraction determines a fast pulse, and a slow rise and slow decay of the pulse wave determines a slow pulse.

Pulse registration. The rate, rhythm, tension and strength of the pulse are recorded daily in the patient's medical record, and on the temperature sheet, the pulse rate is indicated in red followed by an image in the form of a curved line, as well as body temperature (see Section 6 (6.2)).

When assessing the pulse in patients with diseases of the heart muscle or the cardiac conduction system, extrasystole and atrial fibrillation are most often detected. Extrasystole is characterized by the occurrence of an additional systole (extrasystole) between two successive contractions of the heart. The pause between cardiac contractions, which occurs after extrasystole (compensatory pause), is much longer than usual.

Atrial fibrillation is characterized by the presence of an irregular rhythm and different strength of the pulse, when pulse waves arise chaotically. Often with atrial fibrillation, a pulse deficit develops, in which not all heartbeats push out a sufficient amount of blood into the artery, and some contractions are so weak that the pulse wave does not reach the peripheral arteries and is not detected palpatory. Therefore, in atrial fibrillation, it is mandatory to calculate first the heart rate, and then the pulse rate on the radial artery and the difference between these two indicators determines the pulse deficit.

7.2. Definition and characteristics of blood pressure.

First aid in critical changes in blood pressure

Blood pressure (BP) is the pressure of blood against the walls of a blood vessel or heart cavity. Blood pressure measurement is an important diagnostic method that displays the strength of the heart, blood flow in the arteries, resistance and elasticity of peripheral vessels. The level of blood pressure is influenced by the magnitude and rate of cardiac output, the rate and rhythm of heart contractions, and the peripheral resistance of the arteriole walls.

Blood pressure in the arteries during the period of ventricular systole and during the maximum increase in pulse waves is called systolic, and the pressure that is maintained in the arteries during diastole due

to a decrease in their tone is called diastolic. The difference between systolic and diastolic pressure is called pulse pressure.

Methods for measuring blood pressure are direct and indirect. Direct methods for measuring blood pressure are used in cardiac surgery. In clinical practice, the generally accepted auscultatory method is performed using a mercury, membrane, or electronic sphygmomanometer. The sphygmomanometer consists of a 14 cm wide cuff, which, when pumping air, squeezes the artery, a pressure gauge and a rubber bulb, with which air is pumped into the cuff. Cuffs are of standard size and special (for children, large for overweight patients). A phonendoscope is used to assess arterial tones (Fig. 7.2).

Conditions for the study of blood pressure:

- Within 30 minutes before measuring blood pressure, do not smoke, do not consume alcoholic beverages, strong tea, coffee, medications with caffeine, adrenostimulants.
- Do not play sports for 1 hour before measuring blood pressure.
- When treating with antihypertensive drugs, blood pressure should be measured after the end of their action before taking the next dose.
- During the first study of blood pressure, measurements should be taken on both hands, then on the arm where the pressure is higher.
- When registering the same blood pressure on both arms, measure it on the right arm.



Fig. 7.2. Blood pressure measuring

Blood pressure measurement technique (Fig. 7.2):

1. The measurement is carried out in a quiet room, after 5 minute-long rest.

2. The patient lies or sits in a comfortable relaxed position (tension in the muscles of the extremities, abdominal press leads to an increase in blood pressure).

3. Measurement is carried out first on the right hand, freeing the hand from tight clothing.

4. The hand, if possible, should be at the level of the heart.

5. If the diameter of the arm above the elbow is less than 42 cm, use a standard cuff, if more than 42 cm use a special one.

6. The cuff is attached 2–3 cm above the elbow bend; the cuff should fit snugly around the arm, but not press on.

7. The rubber tube connecting the cuff with the apparatus and the balloon should be placed laterally to the subject.

8. By pumping air into the cuff, the pulse is probed on the radial artery and the column of mercury or the arrow of the manometer is monitored; after the disappearance of the pulse, the pressure is increased by 20–30 mm Hg.

9. The rate of decrease in pressure in the cuff is 2 mm Hg per second (with arrhythmias, slow decompression is needed, since an auscultatory interval of 5–10 mm Hg is possible).

10. Systolic blood pressure is assessed during the period of onset of pulsation, diastolic – during the period of pulsation disappearance.

11. Assess the measurement result by the nearest paired reading with an accuracy of 2 mm Hg, which is one division of the scale.

12. Blood pressure is measured twice with an interval of 2–3 minutes; the level of blood pressure is considered the average reading of two measurements.

The results of measuring blood pressure are recorded daily in the medical history and in the temperature sheet («blood pressure» scale) in the form of bars: the systolic pressure is depicted in a red bar and the diastolic pressure – in blue (one division on the «blood pressure» scale is 5 mm Hg).

Normally, the blood pressure level is in the range from 100/60 to 139/89 mm Hg. Depending on various physiological processes (fatigue,

agitation, eating, etc.), the level of blood pressure may vary. Its daily fluctuations are in the range of 10–20 mm Hg. In the morning, the pressure is slightly lower than in the evening. Blood pressure rises slightly with age. An increase in blood pressure above the norm (above 140/90 mm Hg) called *arterial hypertension*, and the decrease is called *arterial hypotension*.

Arterial hypertension (AH) is a chronic disease in which the main diagnostic sign (symptom) is a persistent increase in hydraulic pressure in the arterial vessels of the systemic circulation. High blood pressure is said to be consistently 140/90 mm Hg or higher.

Table 4.

Classification of arterial hypertension by blood pressure

Categories	Systolic BP, mm Hg	Diastolic BP, mm Hg
Optimal	< 120	< 80
Normal	120–129	80–84
Elevated normal	130–139	85–89
Hypertension:		
1 degree	140–159	and /or 90–99
2 degree	160–179	and /or 100–109
3 degree	≥ 180	and /or ≥ 110
Isolated systolic hypertension	≥ 140	< 90

Arterial hypotension (hypotonic disease, hypotension) is a condition characterized by a decrease in systolic blood pressure below 100 mm Hg, diastolic – below 60 mm Hg. Sometimes this condition can be at the root of an independent disease or it can be a symptom of multiple diseases.

A decrease in blood pressure below normal is critical diagnostic sign of acute vascular insufficiency in the form of fainting, collapse, shock.

A sharp drop in blood pressure can cause the patient to faint. Fainting can be caused by anemia, heart defects, heart block, sudden changes in body position, standing for a long time, negative emotions, severe pain, fasting.

Fainting is a sudden short-term loss of consciousness caused by cerebral ischemia. Sometimes fainting is preceded by a semi-faint state – sudden weakness, dizziness, blurred vision, tinnitus, nausea.

The main clinical symptoms are: loss of consciousness; pallor and moisture of the skin; rare shallow breathing; decrease in blood pressure; pulse of weak strength and tension; pupils are moderately dilated, react vividly to light.

Collapse is an acute vascular insufficiency caused by a pronounced and prolonged decrease in vascular tone and a decrease in the general blood circulation. Collapse is a direct threat to the patient's life and requires immediate treatment.

The clinical picture of the collapse is sudden onset, complaints of severe weakness and chilliness; the patient has «Hippocratic face» (concavity of cheeks and temples, sunken eyes, leaden complexion, cyanotic, dry skin); the patient's passive position in bed, indifference to everything that surrounds him/her; cold cyanotic extremities (the sign of peripheral collapse); breathing is very frequent, shallow, the pulse is also of high rate, weak and threadlike, the veins are spasmodic, the blood pressure is sharply reduced.

The causes of collapse can be blood loss, diseases of the cardiovascular system, myocardial infarction, pulmonary embolism, infectious and acute inflammatory diseases, trauma, food poisoning, drug allergies.

During collapse and shock, a prolonged decrease in blood pressure, tachycardia, peripheral signs of circulatory disorders is observed.

First aid in critical changes in blood pressure.

First aid in high blood pressure:

- measure blood pressure and assess the basic parameters of the pulse;
- call a physician;
- put the patient in bed with a raised headrest and provide him/her with complete physical and mental rest;
- provide access to fresh air (oxygen can be inhaled);
- put mustard plasters on the occiput and calf muscles;
- make hot or mustard foot baths, warm hand baths;
- put a cold compress to the head;
- prepare necessary medications.

After a crisis, change the patient's underwear; explain that after the use of antihypertensive therapy, one should be in the supine position for 2–3 hours to prevent collapse.

First aid in blood pressure lowering.

First aid in fainting:

- place the patient in a horizontal position with legs raised at the angle of 45°;
- provide access to fresh air;
- free the neck and chest from tight clothing;
- spray the face with cold water;
- sniff a cotton swab moistened with ammonia;
- slap on the cheeks.

First aid in collapse:

- eliminate the causes of collapse (arrest the hemorrhage, remove poison from the body);
- warm the patient;
- give oxygen to breathe;
- in a horizontal position, the patient is quickly transported to the appropriate unit of the hospital;
- administer medications that increase blood pressure (adrenaline, mesatone, glucocorticoids) as prescribed by a physician.

The technique for stopping bleeding from arterial and venous vessels, applying a hemostatic tourniquet is described in Section 14.

7.3. Definition and characteristics of breathing.

Pre-hospital care for respiratory illnesses

Breathing is characterized by rapidness, rhythm, depth, periodicity. Normally, breathing is silent and invisible to others. Usually, a person breathes through their nose with their mouth closed. In an adult at rest, the respiratory rate (RR) is 16–20 per minute, and the inhalation is twice as short as the exhalation. In case of diseases of the respiratory system, it is necessary to monitor the rate, depth and rhythm of breathing of patients.

Respiratory rate. RR depends on the age, gender, position of the patient. In an adult at rest, the RR is 16–20 per minute; in women the RR is slightly higher than in men. In newborns, the RR reaches 40–45 per minute, decreases with age and reaches the RR of an adult by the age of 20. In the standing position, the RR is more frequent (18–20), than in the prone position (12–14). Athletes have a respiratory rate

of 8–10 per minute. Change in the respiratory rate: rapid breathing is called tachypnea; slow breathing is called bradypnea.

Assess the RR by counting the movements of the chest or abdominal wall for 1 min. This is done unnoticed by the patient, holding his/her hand, as if to count the pulse. The results obtained are daily recorded to the temperature sheet with a blue pencil in the form of a RR graph.

Tachypnea is rapid breathing caused by dysfunction of the respiratory center in physiological conditions (excitation, physical activity, food intake). It is short-term and quickly passes after the termination of the provoking factor.

The causes of pathological tachypnea can be:

- damage to the lungs, accompanied by a decrease in their respiratory surface, a decrease in the excursion of the lungs due to a decrease in the elasticity of the lung tissue, disruption of gas exchange in the alveoli (accumulation of carbon dioxide in the blood);

- damage to the bronchi, which is accompanied by obstruction of air access to the alveoli and partial or complete blockage of their lumen;

- damage to the respiratory muscles and pleura, accompanied by difficult contraction of the intercostal muscles and diaphragm due to sharp pain, paralysis of the diaphragm, increased intra-abdominal pressure, which is one of the reasons for the decrease in respiratory excursion of the lungs;

- damage to the central nervous system due to intoxication and disruption of the respiratory center;

- pathology of the cardiovascular system and hematopoietic organs, accompanied by the development of hypoxemia.

Most often, rapid breathing is caused by combination of several reasons.

Bradypnea is slow breathing due to a decrease in the excitability of the respiratory center. Physiological bradypnea can be observed during sleep, hypnosis. Pathologically slow breathing is observed in the case of depression of the respiratory center and a decrease in its excitability.

Bradypnea is caused by a number of reasons, primarily damage to the central nervous system:

- increased intracranial pressure (brain tumor, hernia);
- hemodynamic disturbances and the development of hypoxia (stroke, cerebral edema, agony);

- exo- and endointoxication (meningitis, uremia, hepatic and diabetic coma);

- the use of anesthetics and other medications (morphine poisoning).

Bradypnoe is less commonly observed in chronic obstructive pulmonary diseases (chronic obstructive bronchitis, pulmonary emphysema, bronchial asthma).

A type of slow breathing is **stridorous**, which is a slow noisy breathing caused by a sharp compression of the larynx (tumor, goiter, laryngeal edema, less often, aortic aneurysm).

Breathing depth. The depth of breathing is assessed by the volume of inhaled and exhaled air in the state of rest. In a healthy person under physiological conditions, the volume of respiratory air is 500 ml. Depending on the change in the depth of respiratory movements, shallow and deep breathing are distinguished.

Shallow breathing (hypopnea) is observed in pathological increase in breathing due to the reduction of both phases of breathing (inhalation and exhalation).

Deep breathing (hyperpnea) is often combined with pathologically slow breathing. For example, «Kussmaul breathing» or «air hunger», a rare, deep, noisy breathing caused by the development of metabolic acidosis with subsequent irritation of the respiratory center with acidic products, is observed in patients with diabetic, uremic and hepatic coma

Breathing rhythm. The breathing of a healthy person is rhythmic, of the same depth, duration and alternation of the phases of inhalation and exhalation. In damage to the central nervous system, breathing becomes arrhythmic: individual respiratory movements of different depths are sometimes more often, sometimes less often. Sometimes, during arrhythmic breathing, after a certain number of respiratory movements, an extended pause or short-term breath holding (apnea) appears. This breathing is called periodic. It includes the following pathological types of respiration: Cheyne-Stokes, Grokko undulating respiration and Biot's respiration.

Cheyne-Stokes respiration is periodic pathological breathing, characterized by a long (from several seconds to 1 min) respiratory pause (apnea), after which, silent shallow breathing rapidly increases in depth, becomes loud and reaches a maximum on the 5–7th inhalation, then in

the same sequence decreases and ends with the next short pause – apnea. During a pause, the patient is poorly oriented in the surrounding space or completely loses consciousness; after the restoration of respiratory movements, he/she comes to senses.

Cheyne-Stokes respiration is caused by a decrease in the excitability of the respiratory center, acute or chronic insufficiency of cerebral circulation, cerebral hypoxia, increased intoxication. It often occurs during sleep in the elderly with severe cerebral atherosclerosis, in patients with chronic cerebral circulation insufficiency, chronic renal failure (uremia), in the use of drugs (morphine) or alcohol dependence.

Grokko undulating respiration or dissociated breathing is characterized by an undulating change in the depth of breathing and differs from Cheyne-Stokes respiration in the absence of periods of apnea. Grokko respiration is caused by damage to the coordination center of breathing, caused by chronic cerebrovascular accident. It is more often observed in brain abscess, meningitis, brain tumor.

Biot's respiration is periodic pathological breathing, characterized by rhythmic, but deep breathing movements, which alternate at regular intervals with a long (from several seconds to half a minute) respiratory pause. Biot's respiration is caused by a deep disorder of cerebral circulation and is observed in patients with meningitis and in a state of agony.

Thus, the identified disturbances in the rate, rhythm, depth of breathing and the emergence of pathological forms (Cheyne-Stokes, Biot's, Grokko, Kussmaul respirations) are characteristic symptoms of respiratory system disorder.

Shortness of breath (dyspnea) is a feeling of lack of air, accompanied by disturbances of the rate, rhythm and depth of breathing, based on the development of tissue hypoxia. Therefore, in case of respiratory failure, the development of respiratory failure, saturation is to be assessed (SpO₂ – blood oxygen saturation) using a pulse oximeter (Fig. 7.3).

Physiological and *pathological* shortness of breath should be distinguished.

Physiological dyspnea is a compensatory reaction of the body on the part of the respiratory system in response to significant physical or emotional stress, manifests itself by frequent and deep breathing, has

a short-term nature, goes away on its own at rest for 3–5 minutes and does not cause discomfort.

Pathological dyspnea is a more persistent disruption of the rate, rhythm and depth of breathing, which is accompanied by unpleasant sensations (compression in the chest, feeling of lack of air), caused by damage to various organs and systems, primarily the respiratory and cardiovascular ones.

Pathological dyspnea is distinguished as:

- subjective, objective, mixed in relation to the patient;
- persistent, prolonged, paroxysmal by the time of emergence;
- inspiratory, expiratory, mixed by the structure of the respiratory cycle.

Clinically, shortness of breath can be manifested by subjective and objective signs, therefore, subjective, objective and mixed dyspnea are distinguished. Subjective dyspnea is respiratory disorder, manifested by a subjective feeling of compression in the chest, lack of air, difficulty breathing in or out is characteristic of hysteria, neurasthenia. Objective dyspnea is respiratory disorder, which manifests itself in intermittent speech (the patient catches air with the mouth during a conversation), tachypnea (respiratory rate more than 30 per minute), respiratory rhythm disturbance, participation of auxiliary muscles in breathing (tension of the cervical and trapezius muscles), the emergence of cyanosis is observed for diseases of the lungs, heart, central nervous system, muscular system.

Asthma (suffocation) is an acute attack of shortness of breath, caused by a sharp disorder of the respiratory center. This is an objective sign of acute respiratory failure due to a sudden spasm, edema of the bronchial mucosa or the ingress of a foreign body into the respiratory tract. The main and characteristic clinical manifestation of asthma is its sudden onset, intensity, feeling of lack of air; a rapid increase in objective signs of respiratory failure – diffuse cyanosis, edema of the cervical veins, tachypnea more than 30 per minute; forced position –



Fig. 7.3. Assessment of saturation.

orthopnea with support of the hands (bronchial asthma) and without support of the hands (cardiac asthma).

First aid in asthma attacks:

- to seat the patient or help him/her to take a semi-sitting position;
- release the chest from squeezing clothing;
- provide an influx of fresh air and oxygen;
- put a heating pad at the feet;
- inform a physician and fulfill all his/her prescriptions for the first aid.

Cough is a reflex-protective act in the form of a jerky forced expiration in response to irritation of the receptors of the respiratory tract and pleura. Cough is an important symptom of respiratory damage. Depending on the rhythm, constant, periodic and paroxysmal cough is distinguished. By the tone, a cough is distinguished as cautious, barking, hoarse and soundless. Unproductive cough (dry without phlegm) and productive (wet with phlegm) should also be distinguished. By the time of emergence, a cough is distinguished as morning, evening and night.

First aid in coughing:

- provide the patient with a comfortable position (sitting or reclining), in which the cough decreases;
- give a warm drink (milk with sodium bicarbonate or mineral water such as Borjomi);
- cover up warmly to prevent hypothermia;
- ensure the supply of fresh air;
- if the cough is accompanied by the release of a significant amount of sputum, give the patient a drainage position for several hours a day, which contributes to better sputum discharge;
- provide the patient with the awareness how properly handle sputum: collect only in a spittoon or a jar with a tight lid.

UNIT 8

The use of the main types of medications. External and internal use of medications

One of the most important methods of treating human diseases is the use of medications – drugs or pharmaceuticals.

Medications are administered by various methods:

1. External (rubbing, lubrication, applications, dusting).
2. Internal or enteral (through the mouth, through the rectum, under the tongue, through the gastric fistula).
3. Inhalation.
4. Through the mucous membranes (administration of drugs into the conjunctival sac, nose and external auditory canal).
5. Parenterally, that is, by injection (subcutaneous, intradermal, intramuscular, intravenous, intraarterial, intrapleural, intraarticular, intraspinal).

8.1. External use of medications

Rubbing in of medicinal substances is a method of administration of drugs through the skin without violating its integrity. Under the influence of kneading, the skin heats up, blood and lymph circulation increases in it, the excretory ducts of the sebaceous and sweat glands expand, through which the substance is easily absorbed.

Indications for use: disorders of blood and lymph flow, dysfunction of peripheral nerve ramifications in the skin, trophic processes, parasitic skin diseases (scabies), alopecia areata ; to influence the surrounding tissues; acute and chronic lesions of muscles, peripheral nerve trunks, lymphadenitis, prolonged and chronic inflammation of the joints.

Drug formulation: liquids (salicylates), ointments (mercury, sulfuric, various balms).

Rubbing is usually carried out on the areas where the skin is the thinnest (flexor surface of the forearm, back of the thighs, lateral surfaces of the chest, abdomen, temples), hairless places (if the hair present, then it is shaved off). This procedure is usually performed at night. The skin in the area where the medicinal substance is rubbed is thoroughly washed with warm water and soap. The required amount of a medicinal substance is applied to the skin, it is evenly distributed over the surface; with circular movements of the fingers, the substance is rubbed into the skin until the latter becomes dry. Then a loose bandage is applied to this place.

Contraindications: severe skin lesions (bedsores, eczema, maceration, boils, carbuncles, rash).

Greasing is the application of various ointments, pastes to the affected areas of the skin. Ointment or paste is applied to the affected skin with a spatula or gauze pad, spreading it in an even layer. If a suspension is used, it must be shaken before use. If it is necessary to grease the scalp, the hair is clipped or shaved off. If this cannot be done, then grease the skin in the direction of hair growth. With pustular rashes, the skin is greased around the lesions in the direction from the periphery to the center.

Ointment dressings are used if long-term exposure of the medication to the skin is necessary. A small amount of ointment is applied to a gauze pad or directly to the affected area. Cover the gauze napkin with compress paper and then cotton wool. The bandage is tightly bandaged or fixed with an adhesive plaster. The bandage can be kept for 12–24 hours.

Wet-drying dressings. A sterile gauze napkin of 8–10 layers is moistened with a medicinal substance, wrung out and applied to the affected area of the skin. Put compress paper on top and bandage it. You need to know that cotton wool is not recommended to be applied, as it slows down drying. If the dressing is dry and does not come off on its own, it is soaked with the same medicinal substance. Indications: acute inflammatory skin lesions accompanied by maceration, eczema.

Poudrage and dusting powders. Various indifferent dusts and powders are used: rice powder, zinc oxide powder, boric acid, talc (silicon-magnesium salt), starch. A clean cotton swab is immersed in dust or powder, sprinkle or dust the affected area, lightly touching it with a cotton swab. The treated area is covered with a thin layer of gauze and bandaged. Indications: to reduce skin irritation, diaper rash, excessive sweating, especially in closed areas; drying and disinfection of affected skin areas.

8.2. Enteral administration of medications

Enteral route is administration of drugs through the gastrointestinal tract (*enteron* – an intestine); the ways of administration are «sub lingua – under the tongue», «per os – through the mouth», «per rectum – through the rectum». These methods are listed according to the rate of action of the drugs in the body. The drugs act faster when administered under the tongue.

Sublingual (*sub lingua* – under the tongue) administration of drugs ensures their rapid and complete absorption due to the active absorption properties of the oral mucosa. Rapid-acting drugs are taken sublingually, for example: nitroglycerin, validol.

Oral (*per os* – through the mouth) administration of drugs is the most common method, as it has significant advantages, namely: it is the most physiological, convenient to use, allows the use of various dosage forms. In some cases, for a direct effect on the digestive tract, it becomes irreplaceable. This method is convenient and easy to use, does not require the creation of additional conditions, complex apparatus or devices.

For oral administration of drugs into the body, the following features should be taken into account:

- in case of impaired swallowing, drugs are administered into the stomach in liquid form through a probe;
- in the inflammatory diseases of the stomach, drugs are taken after meals;
- drugs that stimulate the secretion of the digestive glands of action are taken with meals;
- drugs that suppress the secretion of digestive juices, it is advisable to use immediately before eating.

Disadvantages of this method:

- a long period from the moment of taking the drug until it enters the bloodstream and directly to the pathological focus, due to the slow absorption of the drug in the digestive tract;
- a significant likelihood of the disintegration of drugs by enzymes of the digestive glands;
- difficulties in ensuring the required concentration of the drug in the blood;
- the likelihood of irritation of the digestive tract by certain medications;
- difficulties or inability to administer drugs by this method to patients with impaired swallowing, after operations in the oral cavity, esophagus, stomach, or rectum;
- complications in the administration of drugs to mental patients, or patients in a state of excitation;
- a limited number of drugs that can be introduced into the body by the enteral route, in particular by the rectal route.

Rectal (*per rectum* – through the rectum) administration of drugs is used for diseases of the rectum (hemorrhoids, proctitis), obstruction of the esophagus, in disrupted act of swallowing, indomitable vomiting, with physical and mental agitation. For the purpose of rectal administration of drugs, microclysters, drip enemas and medicinal suppositories are used. The disadvantage of this method is the limitation of the amount of drugs that are absorbed by the rectal mucosa.

Administration through a fistula (*per fistulae*) – drugs are administered through an artificial fistula of the stomach with obstruction of the esophagus, after operations on it or on the stomach. In this case, all medicinal substances are administered in a liquid state or in the form of suspensions, oil solutions, after nutrition the patient through a fistula.

8.3. Administration of medications through the respiratory tract

Inhalation is one of the methods of administration of drugs into the body through the respiratory system by inhalation. Gaseous substances are injected by inhalation: oxygen (oxygen cushion (Fig. 8.1)), carbon dioxide, nitrous oxide, as well as some medications in the form of an aerosol. For the use of the latter, special devices are used, called inhalers (Fig. 8.2).



Fig. 8.1. Oxygen cushion.



Fig. 8.2. Inhalers.

The oxygen treatment method has played an important role in the total volume of inhalation therapy. Indications for oxygen therapy are extreme conditions of the body, in which severe respiratory disorders suddenly develop (asphyxia, pulmonary edema); chronic diseases, in particular, of the cardiovascular system (myocardial infarction, heart defects), respiratory organs (pneumonia, bronchial asthma), digestive organs (chronic inflammatory diseases of the liver and biliary tract).

An effective method of inhalation oxygen therapy is administration of oxygen into the airways using a catheter that is placed in the nasal passage. Before insertion, the catheter is sterilized by boiling, and then lubricated with sterile Vaseline oil. The catheter is slowly inserted along the lower nasal passage to a depth of 15 cm. At this distance it reaches the posterior wall of the larynx, which can be determined visually when opening the mouth. In order to stabilize the catheter, it is fixed with an adhesive plaster to the skin of the face. Every hour, a catheter is moved from one nostril to another to prevent trophic changes in the nasal mucosa.

The method of mask oxygen therapy is carried out using an individual oxygen inhaler equipped with a regulator of the oxygen supply rate and a container for its humidification. In the absence of a special humidifier, for this purpose, the Bobrov's apparatus can be used, filled by one third with water. When oxygen is supplied through the mask, its share in the air mixture that the patient inhales should be between 40% and 60%. On the average, the oxygen supply rate when using the mask reaches 4–5 liters per 1 minute. With the help of a special device of the inhaler, the gas flow can be regulated, in particular, to increase it to 10 liters per minute, but patients do not tolerate inhalation of

oxygen in a volume of more than 5 liters per minute. This is because high gas concentrations dry out the mucous membrane of the mouth and respiratory tract. In the absence of a speed regulator, the movement of oxygen can be controlled by the number and rate of formation of gas bubbles in the humidifiers.

8.4. Administration of medications through mucous membranes

Administration of drops into the conjunctival sac of the eye. Eye drops are administered into the conjunctival sac in various diseases of the conjunctiva, crystalline lens, cornea, retina. Boil a pipette, check the expiration date of the medicinal substance. Hands should be washed with soap, and the liquid is drawn into a pipette up to a third of its volume so that the liquid does not get into the rubber can. With the fingers of the left hand, pull the upper or lower eyelid, or both eyelids at the same time, especially when there is blepharospasm. If this cannot be done in a patient in an excited state, then the drops are instilled into the fossa of the inner corner of the palpebral fissure; in this case, the liquid enters the conjunctival sac on its own. The filled pipette is held vertically to the eye. Without affecting the eyelashes, 1–2 drops of the drug are injected into the conjunctival sac. The patient must sit with his/her eyes closed for 5–10 minutes. If after that the liquid flows out of the eyes, it is removed with a cotton swab (separate for each eye).

Putting the ointment into the conjunctival sac. This procedure requires a glass rod with an expanded and flattened end, which should be boiled before the procedure. A small amount (the size of a small pea) of the ointment is collected with the flattened end of a glass rod. The lower eyelid is pulled down with the index finger of the left hand; the ointment is applied to the outer corner of the conjunctiva. The patient is advised to close his/her eyes, after which the eyelids are lightly massaged.

Administration of drops into the nose. The patient's nose is freed from mucus by blowing out and from crusts, using a cotton turunda or a plait. The patient is placed on a couch or seated with his/her head thrown back. A medicinal substance, warmed to body temperature, is drawn into a pipette by a third of its volume. The tip of the patient's nose is raised with the left hand; the head is tilted to the side opposite

to the one where the drops will be injected. Without affecting the nasal mucosa, 5–8 drops of an aqueous solution, or 15–20 drops of an oily solution of a medicinal substance, are injected into each nostril.

Administration of drops into the external auditory canal is made in inflammation of the middle ear. Before administration of drops, the ear is cleaned. The medicinal substance in the form of an aqueous or oily solution is heated to body temperature. The patient's head is tilted towards the healthy ear. With the left hand, the auricle is pulled up and back, while the external auditory canal is straightened and the drops fall into its depth. With the right hand, 5–8 drops are dripped into the ear. The drops are kept in the ear for 10–15 minutes. After that, they tilt the patient's head towards the sore ear so that the drops flow out of it, or dry them with a cotton turunda.

8.5. Parenteral method of drug administration

Parenteral is the method of administration of drugs into the body bypassing the digestive tract, that is, directly into the blood, lymphatic vessels, in the pleural cavity, pericardium, joints, spinal canal. The advantages of this method are the precise dosage and speed of administration of the drug, and a relatively short period of manifestation of the therapeutic effect.

Parenteral methods are contraindicated in case of significant skin lesions (burns, eczema, psoriasis), in seizure, certain mental states, and excitation of the patient.

Parenteral administration of drugs is carried out by infusion or injection. Injection methods are: intradermal, subcutaneous, intramuscular, intravenous, intraarterial, intraosseous, intraarticular, intracavitary administration of drugs (into the pleural cavity, bladder). The injection technique (intradermal, subcutaneous, intramuscular, intravenous, intravenous jet injection) is presented in Section 13 (13.4).

Negative aspects of parenteral methods of drug administration: strict asepsis is required, the participation of medical personnel, the availability of instruments (syringes); the impossibility of introducing oil solutions, suspensions, drugs into the vein that cause hemolysis, thrombosis, the transition of hemoglobin to methemoglobin, containing air; risk of infection; the administration of drugs is often accompanied by pain.

8.6. The procedure for providing a patient with medications

The procedure for providing the patient with medications is clearly regulated:

1) only the physician should prescribe the necessary medications to the patient;

2) only the physician makes records in the medical history and in the list of medical prescriptions of drugs with the definition of doses and methods of their use;

3) the on-duty (ward) nurse makes an order for the necessary medications, prescribing them from the list of medical prescriptions and transferring it to the head nurse of the unit;

4) the general order for the unit, sending it to the pharmacy and receiving the appropriate medications is carried out by the head nurse;

5) the on-duty nurse receives medications from the head nurse;

6) the ward nurse delivers medications to the patient in the ward.

Rules for the distribution of medications for oral administration:

1) when fulfilling the doctor's prescriptions, the nurse is guided by the journal that is at the post or the doctor's prescription sheets;

2) the nurse writes out one-time appointments (sleeping pills, drugs for headache) from the medical history;

3) the intake of most medications is associated with the timing of the meal, namely:

- laxatives, mineral waters, choleric herbs are taken on an empty stomach;

- drugs that irritate the mucous membrane of the digestive tract are taken after meals;

- juice, alkaline drugs, drugs acting on the pathogenic intestinal flora are taken before meals;

- enzymes, choleric drugs, iron preparations are taken during meals;

- all medications that are indifferent to the function of the digestive tract are taken in the intervals between meals;

- sleeping pills are given at a certain time before bedtime;

4) before dispensing medicines, the nurse must check the labels on the packaging with the prescriptions, check the expiration date of the

medicines, and once a day decompose the medications according to their intake. Medications are placed in a special box on a mobile table;

5) patients take medications only in the presence of a nurse or physician;

6) patients who move independently come to the nurse's post themselves and receive medications there; for seriously ill patients, a nurse brings medications to the ward and helps them to take in, gives them to drink boiled water from a drinking bowl;

7) water solutions of drugs and decoctions are given to patients in graduated beakers with marks of 5, 10, 15 and 20 ml;

8) alcohol solutions (for example, Corvalol) are measured in drops into a beaker, adding 10–15 ml of water, mix, give the patient a drink. These drugs must be taken with water.

Storage and accounting of medications.

Medications are stored in special cabinets with a system of boxes that are labeled and closed. Separately, there are 2 boxes: group "A" for poisonous and narcotic substances (narcotic drugs, atropine, etc.); group "B" for potent substances (adrenaline, caffeine, etc.). The boxes are closed with a key, which is constantly at the nurse's post. On the inside of the door, a list of drugs that are in the cabinet is attached. The cabinet has separate shelves for drugs that are administered intravenously, for external use, sterile solutions, substances with a strong odor, flammable substances (alcohol, ether), dressings.

It is necessary to monitor the expiration date of drugs and the rules for their storage. Potions are stored in the refrigerator for 5 days, decoctions for 3 days, penicillin solution for up to 1 day, eye drops for up to 3 days, sterile solutions in closed bottles for up to 10 days.

The head nurse keeps a record of medications in a medicine register with the signature of the chief physician. When dispensing drugs to the ward nurse, the head nurse registers the amount of drugs, indicates the patient's surname and the number of the medical history. Drug registration book is kept at the post of a nurse; it is stitched, numbered, signed by the chief physician and sealed. The nurse on duty keeps the record of the drugs used, notes in the book the number of the medical history, the name of the patient, the number of drugs spent.

UNIT 9

Physical application of medications: external application of medications and physical therapy procedures

The use of means of physical influence on the pathological process by means of a delaying action or irritation of the receptors of the skin and mucous membranes plays an important role in the complex treatment of patients. For this purpose, mustard plasters, cupping-glasses, compresses, hot-water bags, ice packs are often used. By reflex action on the blood and lymphatic vessels, the peripheral nervous system, the above applications activate metabolic processes, increase the body's adaptive reactions, enhance its host defense in the fight against diseases. Irritation of the terminal nerve endings (receptors), which causes the action of the above applications, reaches the pathological focus directly through the central nervous system, causing favorable changes and transformations in it. Various irritants, thermal or cold procedures through the skin can affect the metabolic processes of the whole body, activate the functional activity of various organs and systems. As a result of exposure to the skin of such revulsive irritating factors as heat, cold, vacuum, as a result of increased blood circulation, reflexively, active blood filling of the capillaries (hyperemia) of not only the skin, but also deeply located organs develops, which contributes to the resorption of inflammatory processes, reduction of spastic phenomena, painful sensations.

Cupping-glasses are used for the purpose of physical effect on the circulatory system. Cupping has a beneficial effect not only on superficial but also on deeply located organs. This feature of the action of cupping-glasses contributes to a more effective resorption of inflammatory processes and alleviation of pain (Figure 9.1).



Fig. 9.1. Medical cupping-glasses.



Fig. 9.2. Mustard plasters.

The physical effect of cupping on the body occurs due to the formation of low pressure in the medium under the cupping-glass, which entails a reflex dilatation of blood and lymphatic vessels, drawing blood from deeply located organs and tissues, and enhances the activity of blood and lymph flow. Also, cupping can reflexively affect the state of the cardiovascular system, slowing down the pulse and lowering blood pressure.

The use of cupping-glasses in clinical practice is limited due to the emergence of new effective methods of exposure. They are actively used in cosmetology (rubber, latex) for the treatment of subcutaneous tissue, soft tissues of the trunk.

Mustard plasters. One of the methods of reflex action on blood circulation is application of mustard plasters.

A mustard plaster is a sheet of thick rectangular paper (8 by 12.5 cm), on one side of which a thin layer of dry mustard seed powder is applied. Mustard plasters can be in the form of sachets filled with dry mustard powder (Figure 9.2).

Mustard plasters are stored wrapped in wax paper in a cool dry place. On the average, the effect of the mustard plaster lasts 8–11 months. The principle of action of mustard plasters is based on irritation of the skin receptors with essential mustard oil, which is located in a layer of mustard applied to one of the sides of the mustard plasters. The therapeutic effect of mustard plasters is primarily due to increased local blood circulation.

Mustard plasters are used in acute and chronic inflammatory processes of the upper respiratory tract, pneumonia, hypertensive crisis,

angina pectoris, myositis, neuralgia, neuritis, polyarthritis, migraine. The most common areas for applying mustard plasters are the back of the head, upper chest, atrium, along the spine, between the shoulder blades, calves, and feet. The use of mustard plasters is contraindicated in bleeding, skin diseases, malignant tumors, diseases of the blood system (anemia, leukemia).

Before use, the mustard plaster is immersed for a few seconds in warm water (t 45–50°C), and then applied with the mustard side to the corresponding area of the skin. With increased skin sensitivity, gauze between the mustard plaster and the skin can be applied. A sheet or towel is placed on top of the mustard plaster. For several minutes, the patient feels a burning sensation in the area of application of the mustard plaster, which is accompanied by redness of the skin. The average duration of the use of mustard plasters is 10–15 minutes. Remove the mustard plaster with a vigorous movement, taking it away from the skin. The skin, at the site of the mustard plaster, should be red, which indicates the effectiveness of the procedure. To remove any mustard residue, gently wipe the skin with a damp and then dry cloth. After completing the procedure, the patient should be covered with a blanket. In prolonged use of mustard plasters, as well as in people with sensitive skin, burns may occur, therefore, mustard plasters are not often recommended to be applied to the same place.

Compress is a thermal or cold treatment procedure using a multi-layer dressing. Dry and wet compresses are distinguished. Wet compresses can be warming or cold. A dry compress differs from a wet one only in the first layer: in the first case it is dry gauze, in the second, it is moistened with a medicinal solution.

A *warming compress* is used as a procedure for prolonged heat exposure to the skin and underlying tissues. Mostly a wet compress is used. The mechanism of the therapeutic action of the compress is due to the prolonged dilatation of blood vessels and increased blood circulation in the area of application. This is a stable action of heat, which is formed in a closed moist chamber between the skin and the waterproof layer of the compress, where there is a constant intensive blood flow to the place of application of the compress, which causes resorption of the inflammatory process, improvement of venous outflow, lymph flow, and alleviation of pain.

Indications for the use of the warming compress are various inflammatory diseases of the skin and subcutaneous tissues, joints, muscles, tendons, nerves, pleura; in injection infiltrates, hematomas after trauma. The use of a warming compress is contraindicated for pustular or allergic skin diseases, sepsis, high temperature.

The compress consists of three layers and a fixing bandage. The first layer, which is applied to the body, is gauze or bandage moistened with water or water-alcohol solution, folded in several (6–8) layers; the second layer is waxed paper or oilcloth, which ensures the tightness of the compress; the third is cotton wool for its warmth-keeping. To apply a compress, gauze or bandage of the required size is moistened in water or alcohol solution, the remaining liquid is squeezed out and, in a straightened form, applied to the skin. For the next layer, use wax paper or plastic wrap, the edges of which should protrude 2–3 cm beyond the previous layer. To insulate the compress with a uniform thin layer on top of the paper or film, stir the cotton wool so that it also extends 2–3 cm beyond the previous layer. The compress is fixed with a bandage or gauze. The duration of the compress is 8–10 hours. After removing the compress, the skin is washed with warm water, dried and applied with a dry bandage. Repeated application of the compress is after 2–3 hours.

A *cold compress* is used in some pathological conditions (bruise, the initial stage of infiltration, palpitations, trauma, insect bites, nosebleed). Due to local cooling of tissues and inhibition of blood supply, the compress causes a decrease in the swelling of the affected area and pain, and also helps to stop bleeding.

For a cold compress (lotion), gauze folded in several layers is used, which is moistened with cold water, and in some cases with a medicinal solution, for example, cold tincture of chamomile or mint. To keep the temperature low, an ice pack is placed on top of the compress. The duration of the stay of the lotion on the human body cannot exceed one hour. When the compress is heated during the specified exposure, it is replaced with a new one.

Hot-water bag is used to warm the patient's body and for pain relief in cases of peptic ulcer, colic of the kidneys, radiculitis. Rubber hot-water bags or heating pads are used.



Fig.9.3. Medical hot-water bag.



Fig. 9.4. Ice pack.

The rubber hot-water bag is filled with about three-quarters of its volume with hot water. Then, by pressing the hot-water bag by hand, remove the remaining air from it, screw the plug tightly; check the tightness of the hot-water bag by turning it upside down; wrap it in a towel and put it on a certain place on the body. If you put the hot-water bag on the same place for a long time, pigmented spots may appear on the skin. To prevent their formation, it is recommended to lubricate the skin with petroleum jelly before each use of the hot-water bag. In order to prevent burns it is necessary to prevent contact of the hot-water bag directly to the skin and also to check periodically the temperature level between the hot-water bag and the patient's body.

When using the heating pad, adjust the degree of heating using the knob connected to the thermostat. Remember that the heating pad should not be used at maximum temperature for more than a few minutes, after which it should be switched to medium or minimum heating mode.

The use of the heating pad is contraindicated in bleeding, abdominal pain of unclear origin, acute inflammatory processes in the abdomen (cholecystitis, appendicitis, pancreatitis), malignant tumors, bleeding, thrombophlebitis, infected wounds, tuberculosis, septic conditions.

Ice pack is used to cool (hypothermia) certain areas of the body. It is used in bleeding, initial stages of acute inflammatory processes, reduction of tissue edema in case of injuries, bruises, stings of poisonous insects (wasps, bees, hornets) (Fig. 9.4).

To fill the pack, break the ice into small pieces, fill the pack up to half with it, remove the remaining air from it by hand and screw it tightly with a cork. To prevent overcooling of the skin, a towel should be placed under the ice pack. As the ice melts, the water is drained and the freed volume of the pack is filled with new pieces of ice. Staying on the skin with an ice pack should not exceed 2 hours, subject to short (10–15 minutes) breaks after every 20–30 minutes of its location on the body.

Disinfection of cupping-glasses, rubber hot-water bags, ice packs: twice wipe with gauze soaked in 3% chloramine solution at intervals of 15 minutes. After the second wipe, leave it for 60 minutes. Rinse with water for at least 3 minutes until the smell of disinfectant solution disappears. Allow to dry.

UNIT 10

Organization of patients' nutritional care

Nutrition prescribed as a therapeutic measure is called therapeutic or dietary (from the Greek *diaita* – way of life, dietary regimen). Dietetic nutrition is the use of specially formulated food rations and diets for therapeutic or preventive purposes. Regimen determines the time and number of meals, the intervals between them. Nutrition regimen regulates the requirements for food in terms of energy value, chemical composition, food intake by meal. Meals must be rational and balanced.

The chief physician (chief medical officer) is responsible for the overall management of dietary nutrition in the treatment and preventive care facility. A dietitian is responsible for the organization and adequate use of therapeutic nutrition in the units (Therapeutic, Surgical, Pediatric). He/she supervises the dietitian nurses (diet nurse) and supervises the work of the food service unit. If there is no dietitian, the dietitian nurse takes over the duties of the dietitian. The duties of the dietitian include preparing therapeutic diets and monitoring their implementation; advising physicians in prescribing diets; and monitoring the technology used to prepare dietary meals, their quality and chemical composition. The diet nurse is responsible for supervising the work of the canteen and compliance with sanitary and hygienic norms.

Basic principles of an individual diet:

1. The principle of protection;
2. The principle of correction;
3. The principle of substitution.

The organization of therapeutic nutrition in Ukraine is regulated by the Order № 931 «On improving the organization of therapeutic nutrition and the work of the dietetic system in Ukraine». The order was approved on December 26, 2013, No. 2206/24738.

The order approved: 1) the procedure for organizing the system of therapeutic nutrition of patients in health care facilities; 2) the instruction on the organization of therapeutic nutrition; 3) the nutritional standards in general units (therapeutic, surgical), in gastroenterological departments, in children's and maternity wards.

According to the requirements of MOH Order No. 931, patients receive therapeutic nutrition according to their nutritional status, which is calculated using a table based on the body mass index.

According to nutritional status, patients (except children) are divided into three groups:

1. patients with hypotrophy (BMI <18.5);
2. patients with normotrophy (BMI 18.5–25.0);
3. patients with hypertrophy (BMI >25.0).

The daily amount of basic foods according to nutritional status is defined in the nutritional standards for 1 patient for 1 day in health care institutions according to the profile.

Standard diets for adults are developed based on the patient's energy and nutrient requirements, depending on the initial normo-, hypo- or hypertrophic state.

The physician may also prescribe a special diet (table 1, 1a, 4, 9), depending on the underlying and concomitant diseases.

Order of the Ministry of Health No. 931 changed the **nutritional standards** per patient depending on nutritional status, namely:

- hypotrophics receive more caloric food due to an increase in fat of 1.5 g/kg mt, and hypertrophics receive 0.75 g/kg mt;
- hypotrophics need proteins 1.5 g/kg mt, and hypertrophics need 0.75 g/kg mt;
- 6.5 g/kg mt carbohydrates for hypotrophics, and 3.0 g/kg mt.

At the same time, the energy value of the diet is:

- hypotrophics – 2400–2700 kcal / day;
- normotrophics – 2400–2200 kcal / day;
- hypertrophics – 1900–2000 kcal/day.

Patients with hypertrophic status in comparison with hypotrophic status should receive increased amount of vegetables of 600 g/day, and hypotrophic – 400 g/day (except potatoes), increased amount

of protein food, namely 70 g/day of chicken meat, 70 g/day of fish meat, and 50 g/day each for hypertrophic and normotrophic patients.

Pasta was completely excluded from the diet of hypertrophics, reduced norm of bakery products, namely:

- wheat bread: 150 g/day for hypotrophics, 30 g/day for hypertrophics;
- cereals – 80 g/day and 50 g/day, respectively;
- potatoes – 200 and 100 g/day, respectively;
- butter – 10 and 5 g/day, respectively;
- the need for fruit per patient is 200 g/day.

The main difference between therapeutic nutrition in hospitals, according to this Order, is the reduction in the weight of food per day per patient.

The design and use of a food ration book. The physician prescribes the therapeutic diet by writing down the type of diet in the patient's medical history and in the prescription sheet. Then the ward nurse selects the information about the diet from the prescription sheet and prepares a food ration book in two copies.

In the food ration book the following information must be indicated: full name; ward number; type of diet (if necessary prescribe additional food); date of the food ration book. In the morning, the nurse gives one copy of the ration book to the head nurse of the department and the second copy to the nutrition unit attendant.

The head nurse prepares a portion request, which he/she signs and signs by the Head of the Unit, and delivers it to the nutrition unit. The request is filled out for patients, including those admitted at 12 noon, for 1–2 days in advance.

When performing the duties of the organization of dietary meals in the hospital, medical staff of the hospital is guided by the guidelines for dietetic nutrition of the Ministry of Health of Ukraine, according to which the hospitals set 4 meals for patients (more often for some categories of patients, for example, gastric ulcers – up to 5–6 times). It is worth knowing that the second half of the day should not account for more than 30% of the total daily caloric intake. The break between meals should not exceed 4 hours, and between the last evening meal and the first morning meal should not exceed 11 hours.

10.1. Feeding technique for patients. Types of diet

Techniques for feeding a seriously ill patient. Under strict bed rest for the weakened and seriously ill patients, and if necessary for elderly and senior patients, assistance in feeding is provided by a nurse. When feeding passively, one hand should raise the patient's head with a pillow, the other hand should bring to his/her mouth a drinker with liquid food or a spoon; the neck and chest are covered with oilcloth. Feed the patient in small portions, making sure to leave time for chewing and swallowing; provide drink with the help of a drinking cup or from a cup with a special tube. After a meal, help the patient rinse his/her mouth and wash (wipe) his/her hands.

Enteral and parenteral nutrition.

Enteral (probing) nutrition is used for disorders of chewing and swallowing (diseases, injuries, wounds, burns of the maxillofacial apparatus, pharynx, esophagus; during surgical interventions on them; neurological diseases, brain injury) in unconscious and comatose patients, as well as in severely asthenic patients.

For enteral feeding use food in liquid and semi-liquid form or special artificially created nutrient mixtures (mixtures «Infatrin», «Nutrizon», etc.), which help to restore digestive function, maintain homeostasis and saturate the body with vitamins and micronutrients. In the absence of special contraindications for the basis of the diet, diet 2 in combination with parenteral nutrition is used.

Contraindications: pronounced nausea and vomiting, intestinal paresis after surgical intervention on abdominal organs, presence of tracheostomy or tracheal incubation.

Parenteral nutrition is a peculiar form of therapeutic nutrition. It is used in severe metabolic disorders, when eating naturally is not possible or there is a metabolic disorder due to insufficient absorption of nutrients. Parenteral nutrition can be full or partial. One of the main indicators of the prescription of parenteral nutrition is a pronounced negative nitrogen balance. Nutrients are administered intravenously in the form of fat emulsions, protein hydrolysates, amino acid and glucose solutions, and vitamins.

Absolute indications include:

- preoperative preparation of patients with pathology of the pharynx, esophagus, stomach (constriction, burns, tumors);
- within 3–7 days after laryngeal extirpation, surgical interventions on the pharynx, digestive tract;
- severe complications of the postoperative period (peritonitis, fistulas, abscesses);
- severe purulent-septic processes and trauma;
- resuscitation measures in terminal states.

Contraindications to parenteral nutrition: liver failure, acute and chronic renal failure, thromboembolism, hyperhydration, circulatory failure.

A food enema is a form of artificial nutrition. A food enema is used in cases where the patient is deprived or limited in the ability to take food by mouth. The use of food enemas is limited due to the inability to absorb large amounts of nutrients in the rectum. Most often a food enema is used twice a day, less often three times a day. Food enemas can be used to administer 5% and 10% glucose solutions, water, sodium chloride isotonic solution, and amino acid solutions. The volume of one enema should not exceed 200 ml, and the temperature of the nutrient mixture should be between 38–40°C. Nutrients are administered very slowly. For food enema use a rubber balloon (bulb) with a soft tip, introduced into the rectum by screwing (rotating) movements. If a food enema is not possible (organic diseases of the rectum), nutrients are administered using a drip enema.

The fluid that is administered by means of an enema has a temperature and mechanical effect on the intestine, which can be regulated. The mechanical effect is increased or decreased by adjusting: the amount of liquid (on average 1–1.5 liters); pressure (the higher the Esmarch mug, the stronger the pressure of the liquid that is introduced); the speed of introduction; temperature (the lower the temperature of the liquid, the stronger the contraction of the intestines). Recommended temperature of water for enema is 37–39°C, but for atonic constipation cold enemas are used (up to 12°C), for spastic constipation – warm and hot (37–42°C) which reduces spasm.

UNIT 11

General and specialty care for the seriously ill and agonizing patients

Seriously ill patients include those suffering from diseases with a complicated course that do not respond to effective treatment or have an unfavorable prognosis. The condition of these patients is characterized by profound disorders of the most important functions of the body (nervous activity, respiration, circulation, digestion, excretion) and often leads to numerous exacerbations of the disease, even to death. The condition of a seriously ill person can change at any time. A sudden and intense disruption of the body's vital functions can occur, which can lead to an agonal state.

Agony is a terminal state of organism's vital functions on the verge of life and death, which can last from one or two minutes to several hours. It is accompanied by a dramatic decrease in the activity of the body's basic vital functions: blood circulation, respiration, nervous activity. It is characterized by loss of consciousness, facial changes, clouding of the cornea of the eye; the skin becomes earthy-gray in color, the lower jaw hangs down; often there is involuntary defecation of urine and feces. In agonizing patients, breathing becomes weak and shallow, body temperature and blood pressure decrease, pulse rate and tension decrease, pupils dilate and do not respond to light.

Seriously ill patients are organized for individual surveillance. A nurse must always be at the patient's bedside to monitor the patient's general condition, pulse rate, breathing, blood pressure, skin color and secretions. Individual post is provided with the necessary means for care and emergency assistance (drinker, bedpan, heating pad, bladder bag, vomiting tube, etc.). The nurse makes sure that the patient lies on dry, clean and straightened linen, is covered with a sheet and does not

overcool himself/herself. If necessary, the nurse moistens the patient's lips and, if there are no contraindications, gives him/her water to drink with a spoon or a drinking caddy. Skin care: periodically wipe the skin of the back and sacrum with camphor alcohol or warm water to prevent bedsores. Also wipe the eyelids and nasal passages with a cotton ball soaked in warm water. Monitor the flow of oxygen through a catheter or mask. The physician's prescription must be carried out clearly and in a timely manner and the changes in the patient's condition must be immediately reported to the physician for correction of therapeutic measures.

The patient's position in bed should be physiological, so that all muscle groups are relaxed. This limits the energy expenditure of the body and promotes optimal functioning of all organs and systems. The position on the back with the head slightly elevated and the legs stretched out meets these requirements. It is not necessary to put the patient's leg on the leg, as it promotes the development of vascular thrombosis of the lower leg. Since a seriously ill person is in bed most of the time, it is very important to ensure comfortable conditions for the patient. Therefore it is necessary to follow the sequence of bed care, bed and linen changes, personal hygiene of the seriously ill patient as described in Section 4(4.1). The hygiene of the bed-ridden patient also provides for the provision of special equipment for the timely performance of physiological acts. Patients are provided (on request) with a bedpan for emptying their bowels and a urinal for urination.

Using a bedpan and a urinal. Seriously ill patients are unable to use the toilet on their own, so they have to do all their physiological needs in bed, using a bedpan and a urinal. A nurse helps them with this.

Bedpans come in enamel, rubber and plastic. They have an elongated or rounded shape and are closed with lids (Fig. 11.1).

Rubber bedpans are used for asthenic patients, as well as for patients with bedsores, in incontinence of feces and urine. A compressor is used to inflate it. If the rubber bedpan is under the patient all the time, it is covered with a diaper and then placed under the patient. You must have 2–3 rubber bedpans per one seriously ill person.

Sequence of actions in giving the bedpan to a seriously ill person. First, rinse the bedpan with warm water to warm it up. The patient is



Fig. 11.1. Bedpans.

invited to lift the pelvis and put an oilcloth underneath. If the patient is very weak, one hand is placed under the sacrum, helping him/her raise the pelvis. With the other hand, the bedpan is placed under the buttocks so that the crotch is over the large opening and the tube of the bedpan is returned to the knees. The patient is covered with a blanket and left for some time. After the act of defecation, the bedpan is carefully removed from under the patient so as not to spill the contents, covered with a lid and taken to the toilet. The contents of the bedpan is poured into the toilet, the bedpan is rinsed with water. The patient is washed, the perineal area is dried, and the oilcloth is removed.

A *urinal* is usually an elongated glass vessel with a short tube and a hole at the end. Male and female urinals differ in the structure of the funnel: male urinals have a short tube on top, female urinals have a wider tube, arranged horizontally, with bent edges (Figure 11.2).



Fig.11.2. Urinals (male and female).

Procedure for giving urinals to the seriously ill person. Rinse the urinal with warm water and give it to the patient in bed. After urination, pour the urine bag into the toilet. Clean the perineal area: the patient is washed, wiped and the oilcloth is removed.

Disinfection of a bedpan and a urinal. Bedpan and urinal after use are soaked in 3% chloramine solution for 1 hour, then washed under running water and dried. To remove the pungent ammonia odor of urine the urinal is periodically washed with 2–3% solution of hydrochloric acid or powders that dissolve salts of uric acid.

Keep the bedpan in the toilet room in special cells. For seriously ill patients a clean bedpan can be kept permanently under the bed in a special cell painted with enamel paint and covered with a cloth for bedpans, which is wiped twice a day with 3% chloramine solution.

UNIT 12

The concept of clinical and biological death. The concept of resuscitation

Clinical death is a state of the body occurring within a few minutes (3 to 5 minutes) after respiratory and circulatory arrest, when all external manifestations of vital functions disappear, but irreversible changes have not yet occurred in the organs and tissues most sensitive to hypoxia. Clinical death is a repeated phase of dying. There are outward signs of death of the body, but there is still the potential possibility of restoring vital functions through resuscitation measures. The ECG in clinical death registers complete disappearance of complexes or fibrillary oscillations, mono- or bipolar complexes with no differentiation between the initial and final parts, gradually decreasing frequency of amplitude.

Signs of clinical death:

1. absence of consciousness;
2. absence of manifestation of respiration;
3. absence of pulse on the main vessels (femoral and carotid arteries);
4. disruption of cardiac activity;
5. dilated pupils, absence of their reaction to light.

In clinical practice, in sudden death in conditions of normal temperature, the duration of the state of clinical death lasts 3–5 minutes. The period of clinical death is considered to be the time between circulatory arrest and the beginning of resuscitation. The duration of clinical death determines the length of time from cardiac arrest to recovery of cardiac activity. During this period, resuscitation measures are carried out to maintain blood circulation in the body (if these measures were timely and effective), as judged by the restoration of the pulse on the carotid artery.

According to the up-to-date data, complete recovery of body function (including higher nervous activity) is also possible in longer periods of clinical death, provided a number of actions carried out simultaneously and for some time after the main measures.

These actions (measures to increase BP; improvement of rheological blood parameters; artificial lung ventilation; hormonal therapy; detoxification in the form of hemosorption, plasmapheresis, body lavage, replacement blood transfusion, especially donor artificial blood circulation, as well as some pharmacological action on the brain) neutralize a number of post-reanimation activities and really facilitate the course of the so-called post-reanimation diseases.

An important factor influencing the duration of clinical death is the ambient temperature. In sudden cardiac arrest, clinical death, in conditions of normothermia lasts up to 5 minutes, in subzero temperatures – up to 10 minutes or more.

In the long process of dying the following stages are noted:

1. ***Pre-agony***. Physiological mechanisms of body life activity are in a state of decompensation: central nervous system is depressed, coma is possible; heart activity is weakened, pulse is thready, blood pressure is below critical (70 mm); functions of external respiration and parenchymatous organs are impaired. Pre-agony lasts from several hours to several days. During this time, the patient's condition further deteriorates and ends in a terminal pause. The patient loses consciousness, blood pressure and pulse is not detected, breathing stops, reflexes are absent.

2. ***Terminal pause*** lasts up to a minute.

3. ***Agony (struggle)***. Due to the depletion of the higher order vital centers, the bulbar centers and reticular formation are out of control (activated). The patient's muscle tone and reflexes are restored; external respiration appears (disorderly, involving auxiliary musculature). Above the main arteries the pulse is palpated, vascular tone may be restored – systolic blood pressure increases to 50–70 mm. However, at this time, metabolic disorders in the body's cells become irreversible. The last energy reserves accumulated in macroergic bonds are quickly burned up and within 20–40 seconds clinical death occurs.

Reanimation (resuscitation) is a series of measures aimed at restoring the patient's life in case of sudden respiratory and cardiac arrest.

It is a set of emergency measures carried out to the patient in the state of clinical death, aimed at restoring the vital functions of the body and preventing irreversible damage to its organs and systems. The person performing resuscitation is called a resuscitator.

If the primary measures, namely, artificial respiration and indirect heart massage were not effective, heart defibrillation is performed (Fig. 12.1 and 12.2). The technique of cardiopulmonary resuscitation and cardiac defibrillation is consistently described in algorithms (see Appendix 1. «Cardiopulmonary resuscitation with the use of an AED» algorithm).



Fig. 12.1. Defibrillators.

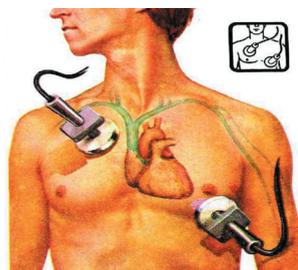


Fig. 12.2. Electrode placement during cardiac defibrillation.

If the methods of revival are not applied in time, clinical death is followed by biological death, which is characterized by an irreversible metabolic disorder.

Biological death occurs when, due to irreversible changes in the body, and primarily in the CNS, return to life is impossible: heart activity stops, breathing ceases, muscles relax, as a result of which the lower jaw sags, the body cools and acquires ambient temperature. Later, bluish-purple death spots appear on the lower parts of the body. The physician states the fact of death and records its day and hour in the medical history.

Rules for handling a corpse. The corpse is undressed, placed (without a pillow) on the back with the limbs unbent, the lower jaw is tied up, the eyelids are lowered, covered with a sheet and left in bed for 2 hours.

The nurse writes the name, first name, patronymic and case history number in ink on the thigh of the deceased. She/he also prepares an accompanying note indicating the surname, first name, patronymic of the deceased, the history number, diagnosis, and date of death.

A corpse may be taken to the pathology department for an autopsy only after there are undoubted signs of death (death spots, rigor mortis, and softening of the eyeball).

The deceased are subjected to an autopsy in the hospital and then given to the relatives. The head nurse gives the deceased's personal belongings list to the nurse against a receipt. The nurse gives the items to relatives after they present the death certificate and passport.

Valuables from the deceased removed from the unit in the presence of the physician on duty, draw up a statement and handed over for storage in the emergency department. The nurse of the admission unit in a special notebook records the name, address and passport number of the relative who received the valuables, and he/she signs in this notebook. If the valuables could not be removed, the ward nurse makes a note in the patient history that the body of the deceased has been sent to the morgue with such valuables.

UNIT 13

Methods of performing medical manipulations

13.1. Priority measures to restore vital functions of the body

Medical professionals must know how to perform the simplest methods of resuscitating the body in case of cardiac arrest and respiration, which may appear in agonizing patients, and sometimes in other extreme situations: drowning, sunstroke, electrical trauma, etc.

Artificial lung ventilation. An effective method of artificial ventilation is mouth-to-mouth or mouth-to-nose resuscitation (Fig. 13.1).

The mouth-to-mouth method. First check the victim's oral cavity and restore patency of his/her upper airways. The victim is placed on a hard flat surface on his/her back with the head sharply tilted back, for this purpose a roller or any bundle should be placed under the shoulders. To prevent hypothermia of the victim's body, it is advisable to put a bedding (blanket, coat) under the back. The rescuer presses the victim's nose with fingers, takes a deep breath, presses the lips to the victim's lips, quickly exhales sharply into the mouth and leans back. As he/she blows air into the victim's lungs, the chest expands. When the rescuer leans back, the victim's rib cage lowers, indicating that exhalation occurs. Blows are repeated with a frequency of 8–12 times per minute in adults and 20 breaths per minute in children. For hygienic purposes it is recommended to cover the victim's mouth with a piece of clean thin fabric (handkerchief, edge of shirt, bandage, kerchief, etc.).

The mouth-to-nose method is used if the mouth and jaws are damaged. Then the victim's head is tilted back with one hand and the mouth is closed with the other, blowing air through the nasal passages. When exhaling, the mouth is opened.

External (indirect) cardiac massage is performed immediately after cardiac arrest. The victim is laid on his/her back on a hard surface. The rescuer kneels on the left side of the victim, places both palms (one on top of the other) on the lower third of the chest and begins to massage – rhythmic compression of the heart between the sternum and the spine at a frequency of 60 times per minute. The arms must not be bent at the elbow joints during the push, they must be straight. The force of the pushes must be such that the sternum moves inward by 4–5 cm. After each push the hands are quickly relaxed without taking them away from the chest, so that the chest expands and blood flows to the heart. When the heart is properly massaged during pressure on the sternum a slight push of the carotid artery is felt; the pupils narrow for a few seconds; the skin of the face and lips turns pink; and independent breaths appear. When performing cardiopulmonary resuscitation with one or two rescuers, the ratio of ALV to cardiac massage is 2:30. Massage is not performed at the moment of air aspiration.

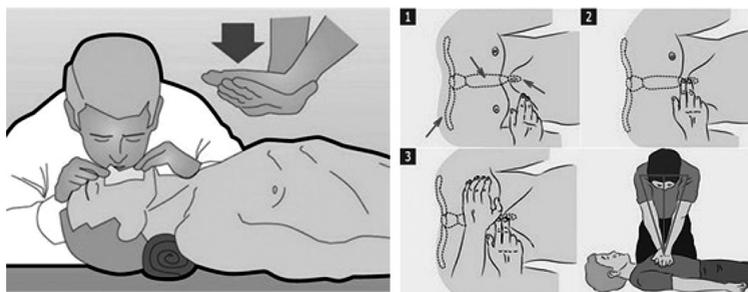


Fig. 13.1. «Mouth-to-mouth» resuscitation and external cardiac massage .

13.2. Hemorrhage and methods of arresting hemorrhage

Hemorrhage is the discharge of blood outside the vascular system or heart into the environment (external hemorrhage), or into the body cavity or lumen of a hollow organ (internal hemorrhage). It is a pathological process resulting from the loss of part of the blood, which is characterized by a number of pathological reactions and causes disruption of the normal course of life processes.

The basis of the syndrome of blood loss is *hypovolemia* (instant, acute or chronic forms), the severity of which depends on the type of

vessel damage, the amount of blood lost, the rate of bleeding, age, sex, state of the victim, the presence of concomitant diseases, compensatory capabilities of the cardiovascular system.

➤ **External hemorrhage.** Hemorrhage is called external bleeding if blood is spilled into the external environment directly from the wound or through natural body orifices.

Hemorrhages can be:

1. Arterial, when blood is bright red, it comes out in a pulsating stream, in jerks (the most dangerous).

2. Venous, when blood is dark red in color, flows out of the wound in a steady stream, continuous and slow.

3. Capillary or superficial, when blood is released in drops or oozes from the whole surface of the wound.

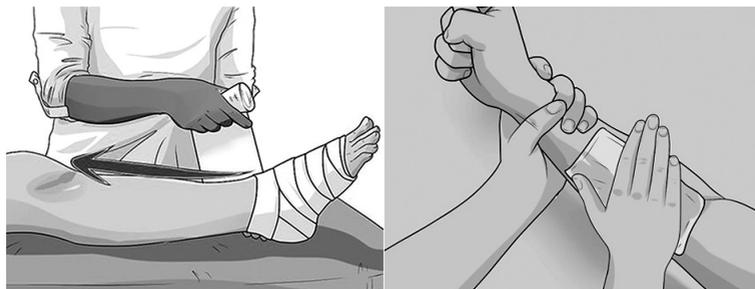
4. Arteriovenous or mixed.

When providing first aid to the victim, you should not waste time in hemorrhage arrest. Various methods of temporary hemorrhage arrest are used (final hemorrhage arrest is done in a medical facility).

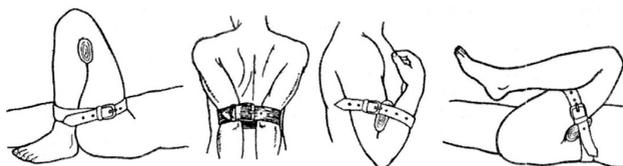
Ways to temporary hemorrhage arrest:

1) Applying a compressive sterile dressing to the wound.

If an arm or leg is wounded, after applying a bandage, the wounded extremity should be raised or given an elevated position. The skin around the wound is treated with an antiseptic solution (iodine, alcohol, vodka, cologne). If a foreign object protrudes from the wound, it must be localized and secured by making a hole in the dressing, otherwise the object may penetrate even deeper inside and cause complications. For small venous (a compressive dressing is applied below the injury site) and capillary hemorrhage, these measures are quite effective.



2) **Giving the extremities a certain position.** Bleeding from the blood vessels of the foot or shin can be stopped by bending the injured leg at the knee joint firmly. Bend the arm as much as possible to stop bleeding from wounds in the forearm and elbow joints. Bandage, kerchief, belt, etc. should be put on the bent extremities with a small roll of bandage or absorbent cotton in the popliteal fossa or elbow bend. Bleeding from wounds in the axillary area can be stopped by pulling both arms bent at the elbows behind the back and tying them together as much as possible. In doing so, the clavicles approach the first rib and compress the subclavian artery.



3) **Pressing the arteries to the bone above the injury.** Arteries are clamped where they are closer to the surface of the body. The temporal artery is pressed in front of the earlobe against the zygomatic bone. When bleeding from the main cervical (carotid) artery, if possible, the wound is clamped with a finger and then packed with more gauze, i.e. tamponized. This is done with the thumb or the other four fingers. Clamping the arteries with the fingers requires some effort, and during the transportation of the victim to squeeze the arteries is quite uncomfortable. Therefore, if possible, a tourniquet or a compression bandage is applied.

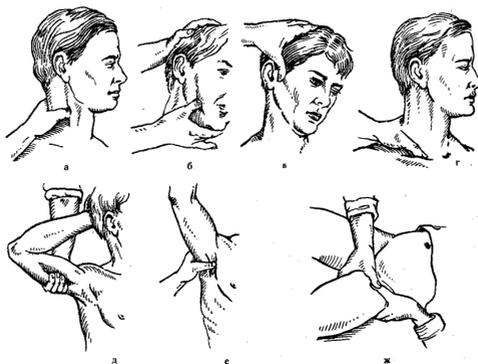




Fig. 13.3a. Rubber elastic tourniquet.

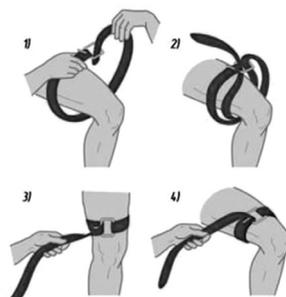


Fig. 13.3b. Cloth tourniquet.

4) **Tourniquet application.** In case of damage of large blood vessels of extremities the most reliable way to stop bleeding is application of rubber elastic or pneumatic tourniquet, as well as made cloth tourniquet (Fig. 13.3a, 13.3b).

A tourniquet is applied:

- on the shin;
- on the thigh;
- on the forearms;
- on the shoulder;
- on the shoulder (high) with attachment to the torso;
- on the thigh (high) with attachment to torso.



The elevated positioning of the extremity leads to a decrease in blood flow in it, which helps reduce bleeding. It is usually combined with the application of a tourniquet. Signs of a properly applied tourniquet include hemorrhage arrest and pulse at the arteries below the tourniquet; waxy pallor of the skin of the extremity. A loosely applied tourniquet does not compress the arteries, but only prevents the outflow of venous blood. This does not stop bleeding, sometimes even intensifies, the extremity becomes cyanotic. In this case, the tourniquet is replaced by another or the same tourniquet is applied again, but slightly above or below the previous place. Excessive tightening of the extremity with a tourniquet can damage soft tissues and nerve trunks. You can tourniquet an extremity no longer than 1.5–2 hours, and in children

no longer than 40 minutes (in winter the time is half as long), as prolonged bleeding leads to permanent functional impairment and even necrosis of the extremity tissues. When transporting an injured person with a tourniquet to a medical facility, a note is attached to the clothes or bandage in which the time of tourniquet application is noted. Prolonged compression of an extremity with a tourniquet often causes significant pain. Therefore, every 30–40 minutes the tourniquet should be loosened for 2–3 minutes by pressing the artery against the bone with the fingers. Then the tourniquet is tightened again or reattached, slightly departing from the previous place.

If there is no standard tourniquet in the first aid kit, a *cloth tourniquet* can be used. A rubber hose, headscarf, towel, scarf and the like are used for this purpose. The ends of the hand-made cloth tourniquet are tied firmly, a wooden or other stick is inserted under it and the loop is twisted until the bleeding stops. To prevent the cloth tourniquet from untwisting, the stick is fixed to the extremity.



Injuries to cervical veins, particularly subclavian veins, can result in air embolism, a severe and fatal complication due to air entering the venous system: *the subclavian vein must be pressed against the clavicle*.

Nosebleed. The victim should be seated, head tilted down, collar unbuttoned. On the bridge of the nose, forehead and occiput lay a handkerchief (towel) soaked in cold water, and press the wings of the nose with thumb and forefinger to the septum. A cotton or gauze swab soaked in 3% hydrogen peroxide solution can be inserted into the nose.

Bleeding from the mouth (ears). The victim should be placed horizontally and a physician should be called quickly, as bleeding from the mouth or ears is a sign of intracranial pressure disturbance in a skull injury.

➤ **Internal hemorrhage.** Victims of internal organ damage (e.g., lung, liver, spleen) have internal bleeding, when blood collects in body cavities, impregnates tissues.

Internal hemorrhage is not easy to detect. Both external and internal bleeding show certain signs of great blood loss: pallor of face and mucous membranes of lips; rapid, hurried breathing; pulse 100 beats per minute or more; formation of black spots on hips and abdomen in form of rash; coldness of extremities, dizziness, yawning, weakness, momentary loss of consciousness.

The patient should be in a half-sitting position (place a pillow under the back) with the legs bent at the knees (cold compresses). It is strictly forbidden to give the victim to drink.

13.3. Methods of immobilization and evacuation of the injured with different types of injuries

Fractures. Care for fractures of various bones has a number of features.

If the *clavicle* is fractured, the clavicle is visually shorter, there is pain at the fracture site, the shoulder and entire arm are flattened downward, and arm movement is restricted.

To provide medical aid, a small soft roll (tightly twisted absorbent cotton or bandage) is placed in the axillary fossa, the arm is bent at the elbow at right angles and tightly bandaged to the torso, and the forearm is suspended on a scarf to the neck (Fig. 13.4).

In fractures of the *humerus*, a transport wire splint is applied, gripping the shoulder, upper arm and forearm bent at the elbow joint and securing it to the shoulder and forearm with a bandage or a scarf, strapping it to the chest in the area of the upper arm. The splints are tied and the arm is suspended around the neck. If there is no transport splint at the scene, the arm bent at the elbow is bandaged to the torso (Fig. 13.5).

Bones of the forearm with fractures in the upper and middle third are immobilized with a splint placed on the outer surface of the arm bent at the elbow, taking the shoulder, forearm and wrist or two splints from improvised materials are applied: one on the inside of the arm so that its upper end reaches the axilla, and the second splint is applied on the outside of the arm (the upper end should protrude above the shoulder joint). The splints are tied and the arm is suspended from the neck.



Fig. 13.4. Immobilization of the clavicle.



Fig. 13.5. Immobilization of the humerus.



Fig. 13.6. Immobilization of the forearm bone.

In fractures of the forearm bones in the lower third, one splint is placed on the inner side (palm surface), the other on the outer side. Both splints should protrude beyond the elbow and reach the fingers. The arm is bent at the elbow and suspended at the neck (Fig. 13.6).

To immobilize the **bones of the hand and fingers** a pneumatic, plywood or cardboard splint is used, which is applied to the palm surface of the forearm, hand and fingers, giving them a half-bent position (wool or bandage roll is placed).

The characteristic signs of the **femur fracture** are sharp pain, inability to lift the leg, curvature of the leg, and turning the foot to the outside. Victims are put on special transport splints – wire or wooden: one – on the inner surface of the leg from groin to foot, and the second – on the outer surface of the leg and torso from inguinal fossa to foot. Both splints are lined with absorbent cotton and bandaged in circular rounds on the lower leg, thigh, abdomen, and chest. If the splints are short, one of the two is made of the required size. The victims are transported in the supine position (Fig. 13.7).

In **tibia fractures**, a standard transport splint is applied to the posterior surface of the extremity, covering the knee and ankle joints as well as the foot. If necessary, two plywood or wooden splints are used (they are applied to the inner and outer surface of the leg from the foot to the middle of the thigh), the injured leg is belted to the healthy one (Fig.13.8). The injured person is transported to hospital on a stretcher.



Fig. 13.7. Immobilization of the femur.

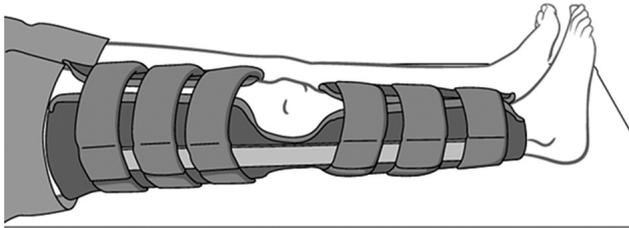


Fig. 13.8. Immobilization of the tibia.

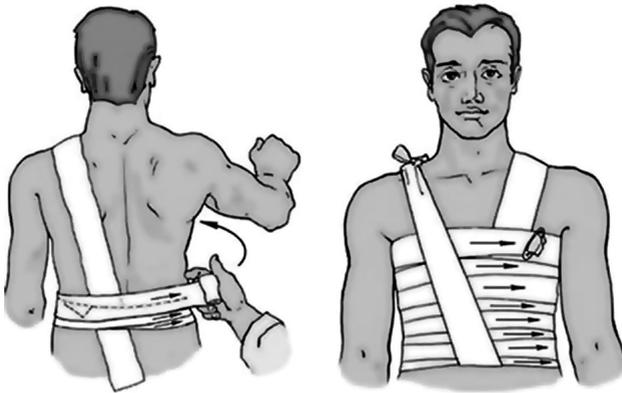


Fig. 13.9. Immobilization in fracture of the ribs.

In fractured **bones of the foot**, the splint should be slightly longer than the length of the foot. Fix the splint at right angles to the lower leg. If the foot is dangling, its position must not be changed.

If **ribs** are broken, the victim experiences severe pain at the site of the fracture, which increases with breathing, coughing, and chest movements. When the **pleura and lungs are injured** at the same time, air accumulates under the skin (subcutaneous emphysema). In such cases, when palpating the skin, you can feel crackling air bubbles (subcutaneous crepitation). In some cases blood spitting occurs.

A tight dressing should be applied around the lower thorax to restrict breathing flexibility (Fig. 13.9). Analgesics can be given to reduce pain. The victim should be transported sitting up.

Spinal fractures are extremely dangerous, especially if the spinal cord is injured. Characteristic signs are sharp pain in the area of the posterior processes and inability to move in the spinal region. When, as a result of a fracture, the **spinal cord is damaged**, paralysis of the extremities, loss of body sensitivity below the fracture site, disorders of pelvic organ function (retention of urine and feces) occurs. The victim must be lifted and carried very carefully. Do not bend the spine as this may damage the spinal cord. Do not lift by the arms and legs to avoid injury to the spinal cord, nerves and soft tissues due to broken bones. At least three people should lift and relocate the patient. The most important thing is to ensure immobility of the spine. To prevent traumatic shock give painkillers (analgin, valerian tincture, Corvalol, Valocordine).

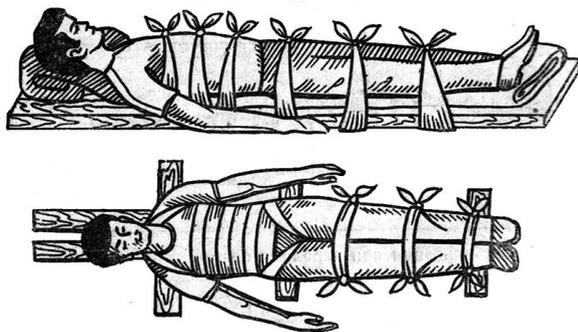


Fig. 13.10. Immobilization in spinal fracture.



Fig. 13.11. Immobilization of neck.

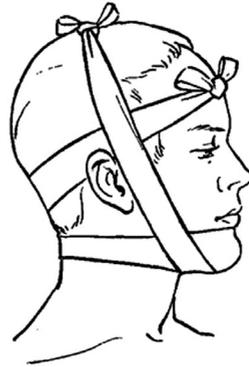


Fig. 13.12. Immobilization in jaw fracture.

The victim is placed on a stretcher with a hard surface in a prone position; a bolster is placed under the shoulders and head. In order to put the patient on the stretcher you first need to carefully turn the victim on the side, put the stretcher next to the victim and roll the patient on it, avoiding the bending of the spine. It is possible to put a plank under the patient before lifting him/her (Fig. 13.10).

When the cervical spine is fractured, the head of the injured person lying face down is immobilized with a cotton bandage in the form of a collar or a large horseshoe around the head. A thick layer of cotton wrap around the neck, chin, and occiput, and then a cardboard collar and bandage are applied (Fig. 13.11). Transport on a solid stretcher.

With a fracture of the pelvic bones the victim cannot stand, walk, and lying down, cannot lift the outstretched leg; swelling, severe pain, bleeding in the groin area and cavity appear at the site of the fracture. It is necessary to put the victim on a rigid stretcher face up, his/her legs should be given the «frog» position; for this purpose put thick rollers under the knees. Use a wide towel or sheet to cover the pelvis and upper thighs and take the victim immediately to a medical facility.

If the **skull bones** are fractured, the victim is laid on his/her back and the head is fixed in the same way as in the case of cervical spine injuries. Fainting of the victim is not an obstacle for transportation.

In nose bone fractures bleeding starts. The victim is transported in a half sitting position and ice is placed on the bridge of the nose.

If the **jaw and chin** are injured, a gauze bandage is applied, the contours of which go around the head and under the chin. If the **upper jaw** is fractured, a splint (plank) is placed between the upper and lower teeth, and then the jaws are fixed with a bandage over the chin (Fig. 13.12).

Transport the victim to the hospital in a sitting position with the head slightly tilted forward to prevent asphyxiation by blood, saliva, or swollen tongue.

13.4. Types of injections and methods of their performance

Depending on the treatment prescribed, the following types of injections are performed (Fig. 13.13):

- 1) Intramuscular (the needle is inserted at a 90° angle);
- 2) Subcutaneous (needle is inserted at a 45° angle);
- 3) Intravenous (needle inserted at 25° angle);
- 4) Intracutaneous (the needle is inserted at an angle of $10-15^\circ$).

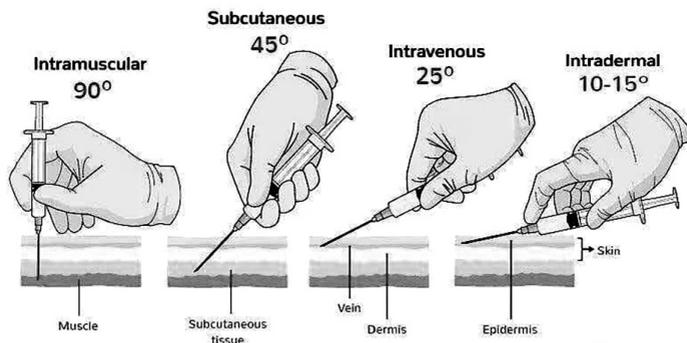


Fig.13.13. Types of injections.

Depending on the injection site, the method of performance has its own peculiarities (Fig. 13.14; 13.15; 13.16; 13.17):

Intramuscular injections. It is performed in the upper outer quadrant of the buttock, outer surface of the thigh, interscapular or subscapular area. Syringes with a capacity of 5 ml or 10 ml with a needle length of 7–10 cm are used.

Method of performance:

1) **Injections into the buttocks.** The patient lies on his/her stomach, the nurse mentally divides the patient's buttock vertically and horizontally into four parts, selects the outer upper quadrant of the buttock, where the large blood vessels and nerve trunks pass. The thumb and forefinger of the left hand press and tighten the skin at the injection site. The needle is quickly injected perpendicular to the surface of the buttock to a depth of 5–6 cm, and then the right thumb slowly squeezes the drug substance from the syringe into the muscle and quickly extracts the needle, put a cotton swab moistened with alcohol on the injection site.

2) **Injection into the thigh.** The patient lies on his/her back; the injection site is the outer or inner part of the upper or middle third of the thigh. The skin is grasped in a large fold. The direction of the needle should be oblique, and the syringe is held like a pen when writing. These conditions must be observed so that the needle does not hit the periosteum or the bone.

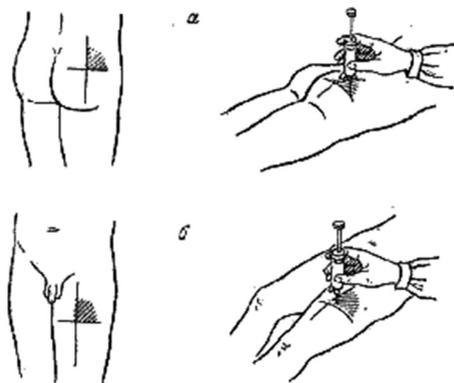


Fig. 13.14. Injection sites.

3) **Injections into the interscapular or subscapular area** (deltoid muscle). The patient sits in a chair with the back straight and the left or right side pressed against the chair. The arm on the side where the needle will be injected should be lowered and pulled back; the corresponding scapula will move away from the posterior surface of

the rib cage, forming a small depression. The needle is pierced to a depth of 5–6 cm parallel to the surface of the back, outside the spine.

Complications of intramuscular injections:

- formation of infiltrates;
- needle breakage;
- damage to nerve trunks due to incorrect choice of injection site.

This dangerous complication can lead to the development of paresis.

Subcutaneous injections. It is performed in the external surface of the upper arm, scapular areas, anterolateral surface of the thigh, and the peritoneal area (Fig. 13.15).

Method of performance (Fig. 13.16). After wiping the skin with ethyl alcohol, the left hand (thumb and forefinger) gather the skin into a fold, and the right hand holds the syringe so that the second finger supports the needle socket, the fifth finger supports the piston, and the remaining fingers support the cylinder. Vigorously pierce the skin at the base of the wrinkle, holding the needle at a 45° angle to the skin surface. After introducing the needle to a depth of 1.5–2 cm slowly inject the injection solution. After the injection the needle is extracted with a quick movement, the injection site is wiped with a cotton swab moistened with ethyl alcohol, which is pressed to the injection site for a few minutes. When oil solutions are injected subcutaneously, they are preheated in an unopened ampoule in order to prevent post-injection abscesses, which are much more likely to occur when injecting cold solutions.

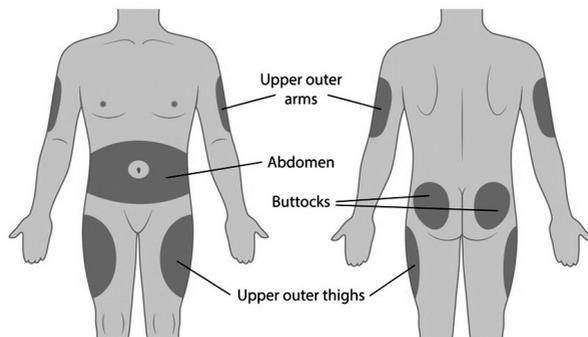


Fig. 13.15. Subcutaneous injections sites.

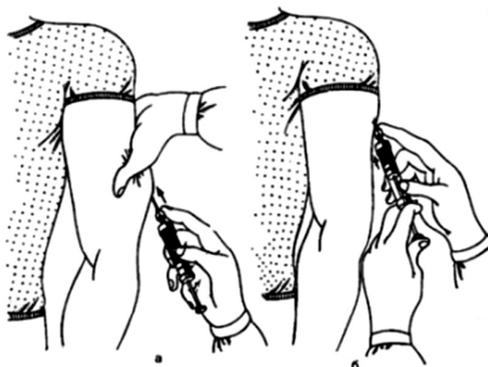


Fig. 13.16. Method of performance of the subcutaneous injections.

Complications of subcutaneous injections:

- formation of inflammatory and suppurative processes in the injection site (abscess, phlegmon);
 - formation of an infiltrate that is slowly resorbed (oil solutions);
 - fatty dystrophy of subcutaneous tissue (lipodystrophy in diabetes mellitus);
- bleeding from the injection site (as a consequence of trauma to a small blood vessel);
 - a very dangerous complication is the ingress of oil solutions or suspensions into the vessels.

Intradermal injections are used to determine sensitivity to antibiotics, external and internal allergens and other immunological tests, as well as for diagnostic purposes (to detect the activity of the tuberculosis process in the body – Mantoux test).

Method of performance. After wiping the skin with ethyl alcohol, pierce the skin with a thin needle 1.5–2 cm long holding the needle at an acute angle of 40° to the skin so that the tip gets under the stratum corneum. Then the needle movement is directed parallel to the skin surface and is advanced up to 0.5 cm, then 1–2 drops of medicine are slowly injected. For intradermal injections, use the inner surface of the forearm, skin of the back, lumbar, pre-cardiac area.

To test for antibiotic tolerance, 1,000 IU of the appropriate antibiotic diluted in 0.1 ml of sodium chloride isotonic solution is administered

to the flexor surface of the forearm. For control purposes, an isotonic sodium chloride solution is injected into the area of the opposite forearm. The sample is considered positive if after a few minutes redness and swelling appear at the site of antibiotic injection. This means that the injection of this antibiotic is strictly contraindicated for the patient.

Intravenous jet administration (injection). In order to quickly enter the medications into the body and their rapid action on the pathological process, the method of intravenous injection is used. Medications for intravenous injection should be sterile and apyrogenic. They are administered in the form of aqueous or alcohol solutions intravenously by jetting with a sterile syringe of 20 ml capacity and needles up to 0.5 mm in diameter and 5–6 cm long. Most often for intravenous infusions, a vein of the ulnar flexure is used. Veins of the back of the hand or foot, subclavian or femoral vein can also be used. If the injection needle cannot be inserted into the vein cavity, it is accessed by a surgical method – venesection.

Method of performance. When drugs are injected into the ulnar flexure vein, artificial blood stasis is created in it. A rubber tourniquet is used for this purpose by tying the middle third of the upper arm with such force that it stops the venous outflow of blood while maintaining the arterial inflow, which is indicated by the presence of a pulse on the radial artery. The tourniquet should be tied in an incomplete knot so that it can be easily untied. In order to increase the swelling of the vein, the patient is asked to clench and unclench the fist several times. During the procedure, the patient should sit or lie down. The skin is wiped with ethyl alcohol at the puncture point. For venipuncture, a sterile needle is used, which is taken by the sleeve with the fingers of the right hand and held over the vein. The skin over the peripheral segment of the vein is pulled away in the direction of the hand. The injection needle is placed over the vein at an angle of 30°-40° to the skin surface and gently pierced. The next vigorous, but smooth movement is made to pierce the wall of the vein, which can be felt tactilely, as well as determined by the flow of blood from the outer hole of the needle. After piercing, the needle is moved further in parallel and along the vessel. After that, the tourniquet is carefully removed, a syringe with medication is attached to the needle, a reverse movement of the piston

checks the presence of the needle in the vein, and then the solution is injected into the vein by smooth pressure on the piston. After the procedure the syringe with the needle is quickly removed from the vein, a cotton swab moistened with ethyl alcohol is placed on the injection site and the arm is bent at the elbow for 2–3 minutes to stop bleeding (Fig. 13.17).



Fig. 13.17. Intravenous injection performance.

Complications of intravenous injections:

- inflammation of the walls of the vein (phlebitis);
- fat embolism can occur when injecting oil solutions;
- dizziness, collapse, cardiac arrhythmia occurs in rapid injection of drugs.

Intravenous drip infusion. The medication is injected into a vein by drip using a sterile intravenous infusion system.

Method of performance. To perform a drip infusion, the infusion system is attached to a needle that connects the bottle with the medicine, which is placed on a special tripod. The system consists of a long plastic tube hermetically packed in a polyethylene bag with a dropper and needles for piercing the vein. The system is sterile and intended for single use. Its expiration date is marked on the bag. Before using the system it is necessary to remove the air from it, for which purpose the lower end of the system is lowered as much as possible, so that the solution that is in the bottle fills the entire lumen of the system tubes. After filling the system with the drug, squeeze the tube in the area closest

to the cannula. After compressing the vein with the tourniquet and piercing it, the injection needle is connected to the system, the clamp is opened and, using the drip device, the number of drops is adjusted. The needle is fixed on the skin with a band-aid. After the end of the infusion, further inflow of drugs is stopped with a clamp. Then the needle is removed and simultaneously a sterile cotton swab soaked in ethyl alcohol is applied to the injection site, and the arm is bent at the elbow until the bleeding stops.

The method of intravenous drug administration is also used for blood transfusion (hemotransfusion, from Latine haema, blood, transfusio, transfusing).

Complications. If the technique of intravenous drug administration is violated, air can get into the vascular bed with the formation of air embolism. Air embolism is a very serious complication that can lead to sudden death of the patient. To prevent it, care must be taken to ensure that all air is extruded from the syringe or system when administering the infusion. Care should be taken when using oily solutions, which can cause a fat embolism if they enter the venous stream.

13.5. Methods of blood pressure measuring

At the doctor's appointment, after taking the anamnesis and a 5-minute rest, start measuring the blood pressure. The patient takes a comfortable sitting or lying down in a calm, relaxed posture, the patient's hand lies in an unbent position (palm up) at the same level as the apparatus. The tonometer cuff is placed on the bare shoulder of the patient 2–3 cm above the elbow bend at the level of the heart so that one finger goes between them. Firmly, but without squeezing soft tissues, fasten the cuff to the shoulder with a clasp (hook, adhesive tape). Connect the manometer to the cuff, fixing it to the cuff, check the position of the arrow (mercury column) relative to the zero mark of the scale. Determine the pulse on the ulnar artery in the ulnar fossa, place the phonendoscope on this place (the pressure of the phonendoscope head must be moderate; otherwise the data will be distorted). Close the valve on the rubber bulb and pump air into the cuff with the balloon until the pulsation in the ulnar artery disappears and the manometer reads 20–30 mm higher than normal (for this patient). Then open the

valve and slowly bleed the air from the cuff, monitor the rate at which the column descends or the arrow moves (readings may change at a rate of 2 mm/sec); at the same time, listen carefully to the tones in the artery and monitor the manometer readings. Note the manometer readings at the moment the first sounds (tones) appear: this is the arterial pressure value at the moment of heart contraction (systolic BP) and at the moment the tones disappear: the arterial pressure at the moment of heart relaxation (diastolic BP); let air out of the cuff completely. Remove the tonometer cuff from the patient's hand and place it in a sheath. Record the data numerically on the observation sheet as a fraction (systolic pressure in the numerator, diastolic pressure in the denominator) and temperature sheet.

The methodology for measuring and characterizing blood pressure is described in more detail in Section 7 (7.2).

13.6. Methods and techniques for colon cleansing

To cleanse the intestines, enemas and a colonic tube are used. A colonic tube is used in seriously ill patients in case of increased gas exchange in the intestine. An accumulation of gas in the intestine (flatulence), which does not come out on its own, causes pain in the abdomen and is painfully tolerated by patients. Flatulence can lead to a deterioration of the patient's condition, cause disruption of cardiac and respiratory activity, disruption of many body functions. Cleansing enema reduces gas formation and diverts gas; however, it has a short-term effect.

A colonic tube is a soft, thick-walled, polished rubber tube 30–50 cm long, 3–5 mm in diameter. The outer end of the tube is slightly widened; the inner end (which is inserted into the anus) is rounded. At the rounded end of the tube there are two holes on the side wall (Fig. 13.18).

To perform the manipulation you need: sterile colonic tube, spatula, Vaseline, tray, vessel, oilcloth, diaper, napkins, rubber gloves (for the nurse), a container of disinfectant solution.

Technique of colonic tube insertion. Rubber gloves are put on, the patient is placed on the left side with the legs turned to the abdomen, and the patient's pelvis is covered with an oilcloth. If the patient



Fig. 13.18. A colonic tube.



Fig. 13.19. Esmarch mug.

cannot be turned on his/her side, the procedure is carried out in the patient's back with knees bent and legs slightly apart. The rounded end of the tube is lubricated with Vaseline, the buttocks are separated and the tube is inserted into the rectum through the anus at a depth of 20–30 cm with rotating movements. The tube is left in the intestine for no more than 2 hours, and then removed. The skin around the anus is wiped with a napkin, if necessary washed with warm water or powdered. The procedure can be repeated several times a day.

An enema is the insertion of various fluids into the intestines through the rectum for diagnostic or therapeutic purposes. A distinction is made between enemas: purgative, siphon, medicinal and drip enemas.

Purifying, stimulating, siphon, nourishing (for introducing nutrients into the body of asthenic patients) and therapeutic enemas are prescribed for therapeutic purposes; for diagnostic purposes enemas are intended for administration of contrasting substances into the intestines for radiological examination. Purgative and siphonic enemas are prescribed before instrumental studies, operations; therapeutic enemas are used for administration of drugs for general and local use. Cleansing and stimulating enemas are prescribed by a physician or experienced paramedic; medicinal and nutritional enemas are prescribed only by a physician.

Cleansing enema. Designed to liquefy and remove the contents of the descending colon.

To perform the manipulation you need: Esmarch mug (Fig. 13.19), tripod, 1–2 liters of water at room temperature, oilcloth, basin, Vaseline oil, rubber gloves.

The technique of performing a cleansing enema. Close the tap on the rubber tube of the Esmarch mug. Put a sterilized tip on the tube, check the integrity of the tip. Fill the Esmarch mug to one third of its volume with water. Open the tap on the rubber tube and fill the entire system with water. The tap on the tube is closed. The patient is laid on his/her left side on the edge of a bed or couch with his/her legs tucked into the stomach. Under the patient's buttocks an oilcloth is placed, which hangs down from the bed to the floor. A bedpan is placed in case the patient cannot hold water. Lubricate the tip with Vaseline oil, take it with the fingers of the right hand and with the left hand take the patient's right buttock upwards. Light rotating movements introduce the tip into the anus. For the first 3–4 cm insert the tip in the direction of the navel, and then another 5–8 cm parallel to the coccyx. Do not insert the tip with force, as this can cause injury to the intestinal wall. Lift the Esmarch mug 1 m above the couch and mount it on a tripod. Open the tap on the rubber tube. If water does not flow into the intestines, this may be due to the tip resting against the intestinal wall or solid feces. The tip should be pulled out 1–2 cm and pushed forward again. You should monitor the rate at which water enters the intestine by adjusting the height of the Esmarch mug. A rapid inflow of water may cause pain and urge to defecation. With constipation accompanied by sluggish intestinal peristalsis, a cool (20°C, less often 16–14°C) enema is given. In spastic constipation use warm (40°C) enemas. Empty the Esmarch mug not all the way, at the bottom of the mug leave a small amount of water to prevent the entry of air into the intestines. Once the liquid was inflowed, the tap on the rubber tube is closed and the tip is removed from the anus by rotating movements. Separate the tip from the system, immerse it in 1% chloramine solution, then boil for 15 minutes. Esmarch mug is washed and wiped.

After the fluid has been injected, the patient should retain it in the intestine for 5–10 minutes. This is achieved by lying quietly on the back and breathing deeply. If the enema has no effect, it is repeated after a few hours.

Siphon enema. Used for intestinal obstruction, poisoning, as well as to remove products of fermentation from the intestine and to remove gas.

To make a siphon enema it is necessary to have: a funnel of 0.5 l capacity, a rubber tube 1.5 m long and 1.5 cm in diameter, which is connected to a flexible rubber tip. In addition, you must have a pitcher, oilcloth, a basin for washing water, Vaseline oil, rubber gloves, gauze wipes, cotton swabs, 10–12 liters of clean water at a temperature of 37–38°C or a weak solution of potassium permanganate.

Technique of performing a siphon enema. The patient should be laid on the left side on the edge of the bed or couch with the legs tucked towards the abdomen and a piece of cotton wool put under the buttocks and hanging off the bed towards the floor. A bedpan is placed in case the patient cannot hold water. Lubricate the tip with Vaseline oil; take the tip with the fingers of the right hand. The left hand takes the patient's right buttock upwards. With light rotating movements the tip is inserted into the anus to a depth of 20–30 cm. A funnel is put on the free end of the tube and placed below the level of the patient's buttocks in an inclined position. Water is poured into the funnel, gradually raising it to 0.5 m above the patient's body. The water level decreases as it flows into the intestines. As soon as the water level reaches the narrowed point of the funnel, the latter is lowered over the basin without turning it over, waiting until it fills with intestinal contents and pours it into the basin. When the funnel is filled with water again, lift the tube over the patient's body and repeat this several times.

Oil enema. The action of the enema is based on a laxative effect, due to increased secretory function of the intestine and peristaltic activity of the intestinal muscles. The action of oil enema on the intestinal mucosa is much gentler than a purging enema, so it is appointed in cases where it is necessary to cleanse the intestines with minimal irritation, for example, in inflammatory processes in the anus, with inflammation of the hemorrhoidal nodes.

For an oil enema, 150–200 ml of lightly heated oil or liquid petroleum jelly is most commonly used. Oil (Vaseline) is injected into the rectum using a rubber bulb or Jeanne syringe with a rubber tip. The injection is carried out slowly, thus ensuring that the oil is spread evenly along the walls of the intestine. After the procedure, the patient should stay

in a horizontal position for 10–15 minutes. The enema is effective after 8–10 hours.

Hypertonic enema. Hypertonic enema is more often prescribed in atonic colitis accompanied by constipation, as well as in postoperative intestinal paresis. The mechanism of action of hypertonic enema is based on activation of fluid transudation through the intestinal wall and also on acceleration of peristalsis, which causes liquefaction of feces. For hypertonic enema hypertonic solutions are used, for example, 10% sodium chloride solution or 30% magnesium sulfate.

The technique of performing a hypertonic enema does not differ from an oil enema, but with a hypertonic enema the act of defecation comes much earlier – about half an hour after the procedure. In order to enhance the laxative effect of the purging enema, 1–2 tablespoons of crushed baby soap are sometimes added to the hypertonic solution.

Therapeutic enema. Therapeutic enemas can be general or local. General therapeutic enema is used when oral or parenteral administration of drugs is impossible or undesirable.

To conduct therapeutic enema use a rubber balloon or Jeanne syringe with a long rubber tip, a pitcher, oilcloth, Vaseline oil, rubber gloves, gauze wipes, cotton swabs.

Before the manipulation a cleansing enema is given 30–40 minutes prior to the manipulation and after the bowels are emptied the drugs are injected. The patient is laid on his/her left side on the edge of a bed or couch with his/her legs tucked towards the abdomen. Oilcloth is placed under the patient's buttocks, which hangs down from the bed to the floor. Lubricate the tip with petroleum jelly and take it with the fingers of the right hand. Take the patient's right buttock upwards by the left hand. With light rotating movements introduce the tip into the anus to a depth of 10–12 cm, then connect the rubber tube to the Jeanne syringe and slowly inject the medication. Clamp the outer opening of the tube to prevent fluid from leaking.

Drip enema. With this method of administering medications, they enter the rectum slowly for better absorption. They do not stretch the intestine, increase its peristalsis, or provoke the act of defecation.

For a drip enema the same system is used as for a cleansing enema, but a dropper with a clamp is placed in the rubber tube that connects

the tip to the Esmarch mug. It is screwed down so that the liquid flows into the rectum NOT in jets but in drops. The clamp regulates the frequency of the drops (40–80–120 drops per 1 minute). Up to 3 liters of liquid can be administered during the day. Instead of the Esmarch mug you can use a system for intravenous drug administration with a tip. The mug with the solution is suspended 1 m above the level of the bed. The nurse should make sure that the patient is well covered (so this procedure is carried out for a long time), that the tubes are not kinked and the flow of liquid is not stopped.

Nutrient enema. This type of enema is a form of artificial feeding. A nutrient enema is used in cases where the patient is deprived or limited in the ability to take food by mouth. The use of nutrient enemas is limited due to the inability to absorb large amounts of nutrients in the rectum. Most often a nutrient enema is used twice a day, less often three times a day.

Nutrient enemas can be used to administer 5% and 10% glucose solutions, water, sodium chloride isotonic solution, and amino acid solutions. The volume of one enema should not exceed 200 ml, and the temperature of the nutrient mixture should be between 38–40°C. Nutrients are administered very slowly. To make a nutrient enema use a rubber balloon (bulb) with a soft tip that should be introduced into the rectum by screwing (rotating) movements. If a nutrient enema is not possible (organic diseases of the rectum), nutrients are administered using a drip enema.

The fluid that is administered by means of an enema has a temperature and mechanical effect on the intestine, which can be regulated. The mechanical effect is increased or decreased by adjusting the amount of liquid (on average 1–1.5 liters), pressure (the higher the Esmarch mug the greater the pressure of the liquid that is introduced), the speed of introduction, temperature (the lower the temperature of the liquid the stronger the bowel contraction). The recommended temperature of water for enema is 37–39°C, but in case of atonic constipation cold enemas are used (up to 12°C), in case of spastic constipation – warm and hot (37–42°C) to decrease spasm.

Disinfection of the accessories for enema. After use, the tip, colonic tube, Jeanne syringe in disassembled form, rubber balloon filled with disinfectant solution, should be soaked in 3% chloramine solution

for 1 hour. Then thoroughly washed under hot water (degreased if necessary) and boiled in distilled water for 30 minutes. The mug and rubber tube are wiped twice soaked in 3% chloramine solution, rinsed with water and dried.

General contraindications to enemas. Absolute contraindications for all types of enemas: gastrointestinal bleeding, acute inflammatory processes in the colon, acute inflammatory or ulcerative processes in the anus, malignant neoplasms of the rectum, acute appendicitis, peritonitis, first days after operations on the digestive system, bleeding from hemorrhoids, rectal prolapse.

Gastric lavage. The procedure is used to clean the stomach from toxic products in cases of poisoning with bad quality food, poisons of synthetic or plant origin (in particular poisonous mushrooms, alcohol, some drugs, alkalis, acids), as well as in some diseases (cancer, kidney failure, severe forms of diabetes), in which toxic substances accumulate in the stomach.

For gastric lavage use a thick gastric tube connected to a glass watering can of 1–2 liters. The lavage is performed with room temperature water in which a small amount of sodium bicarbonate (1 tsp per 1 liter of water) or potassium permanganate (until pale pink) is dissolved.

The lavage is carried out in the following sequence. The patient is placed on a chair or stool with the head slightly tilted forward. A basin or a bucket should be placed between the patient's knees. Removable dentures should be removed before washing. The front part of the body (chest, abdomen) is covered with a cloth apron. The stomach is flushed with a sterilized (boiled) probe. The nurse performing the lavage stands on the right side of the patient. With three fingers of the right hand she/he holds the probe (like a pen) near the rounded end (4–5 cm), invites the patient to open his/her mouth wide and say the sound «ah-ah-ah». At the same time, the probe is inserted behind the root of the tongue with a rapid movement, after which the patient closes his/her mouth and makes several swallowing movements. It should be explained to the patient that the gag reflex can be reduced by swallowing and breathing deeply through the nose while the probe is being swallowed. The patient should not be allowed to pull the probe

out or to clench it with their teeth. If there is no marking on the probe (II), the depth can be determined as follows: the distance from the navel to the incisors is measured and the width of the palm is added to this distance. This is the distance the probe must be inserted to allow it to enter the stomach cavity. To ensure that the probe passes down the esophagus, after several swallowing motions, the probe should be pushed in vigorously for a short distance. If the probe enters the windpipe, which can be determined by coughing and asphyxiation of the patient, the probe should be pulled out urgently and a few minutes later tried again. When inserting the probe, the funnel is held at the level of the patient's knees to avoid air entering the stomach. When the probe has entered the stomach, a pre-prepared solution is poured into the funnel and it is gradually raised above the level of the patient's mouth. The liquid quickly passes from the funnel into the stomach. In order to prevent air from entering the stomach, the funnel should be filled with a new portion of the solution before it is completely emptied. When the water stops pouring out of the watering can, it is lowered to the level of the patient's knees and held over the bucket. The liquid, together with the contents of the stomach, according to the principle of communicating vessels, flows from the stomach into the funnel and pours into the bucket. The procedure is repeated until the rinse water is clear. Sometimes up to 10–12 liters of water are used for the procedure. For asthenic patients the lavage may be performed in the supine position (on the side) with the head low down. After the procedure, the probe is taken out with a quick movement, rinsed with water and the funnel is disconnected, then all parts are boiled.

When the patient cannot swallow the probe, gastric lavage is performed *without the probe*. The patient drinks up to the limit (on average it is 1.5–2 liters) of warm water or a low concentrated aqueous solution of potassium permanganate. If the gag reflex does not come on its own, it can be induced reflexively by irritation of the root of the tongue or the back of the throat with a finger, spoon, spatula, or by pressing on the epigastric area with the palm of the hand. The first portions of lavage water should be collected in a sterile glass jar with a wide neck and a tightly lapped stopper and sent to the laboratory for chemical and bacteriological analysis.

UNIT 14

Methodology for performing first aid measures in case of emergency in emergency situations

First pre-hospital aid is a set of urgent actions aimed at preserving the health and life of the victim, provided immediately on the site of the emergency and during the transportation to a medical facility. Timely provision of properly performed first aid prevents severe complications in the patient, the patient responds better to treatment.

14.1. First aid in poisoning

Poisoning is a group of diseases caused by exposure of the body to poisonous substances of various origins. When poisoning occurs, even before a physician arrives, it is necessary to immediately stop contact of the victim with the poisonous substance and remove it from the body. The poisonous substance can enter the human body through the gastrointestinal tract, respiratory organs, skin or mucous membranes, and depending on this the first aid is provided.

The primary actions of **emergency medical care** in acute poisoning:

- 1) prevention of absorption of toxic substances;
- 2) carrying out specific (antidote) and symptomatic therapy;
- 3) removal of toxic substances entered into the blood (artificial detoxification).

Typical clinical symptoms of poisoning by various substances (mushrooms, drugs, food, alcoholic and narcotic substances) due to entering the gastrointestinal tract: general malaise, repeated vomiting, nausea, abdominal pain, diarrhea, headache, thirst, paleness, temperature increase to 38–40°C, frequent weak pulse, decreased blood pressure, cramps.

If poison enters the gastrointestinal tract (with the exception of acids or alkalis), immediately perform the following actions:

1. The victim is immediately made gastric lavage several times until clear lavage water appears.

2. Make the patient drink 1.5–2.0 liters of water barely tinted with potassium permanganate or water with baking soda (1 teaspoon per 1 glass of water) and induce vomiting by irritation of the root of the tongue.

3. Use adsorbents (activated charcoal), an enveloping agent, to remove the poison from the intestine. As an enveloping agents, egg white (proteins precipitate heavy metals), protein water (2–3 egg whites per 0.5 liter of water), mucous decoctions, linseed decoction, milk, kissel, liquid starch paste, vegetable oil, etc. can be given.

4. After consuming adsorbent substances, give a salt laxative or do repeated lavage to flush out the adsorbent together with the bound poison (1 tablespoon of bitter salt (magnesium sulfate) per 1/2 cup of water).

5. Keep the victim warm and give plenty of water to drink.

If *poisonous gases (carbon monoxide) or fumes get into the airways*, the victim should be provided with fresh air and free from clothing that obstructs breathing. If dizziness or fainting occurs, sniff ammonia, and if breathing stops, conduct artificial respiration. Place a cold compress on the victim's head and chest (a cloth soaked in cold water) and let him/her breathe with humidified oxygen.

During poisoning by drugs, alcoholic and narcotic substances, the first aid is that the victim should never be left alone, since he or she may suffer central nervous system disorders (excitement or inhibition), fainting, respiratory paralysis, or clinical death.

In acid and alkali poisoning the clinical signs are: difficulty in swallowing, burning (swelling) of mucous membranes, sharp pain in the mouth, esophagus and stomach, vomiting blood. Victims are agitated, laryngeal edema with development of asphyxia, fainting is possible.

Treatment of acid and alkali poisoning. Immediately remove saliva and mucus from the victim's mouth by wrapping a teaspoon in gauze, tissue or handkerchief and wipe the mouth. The stomach should not be rinsed as this may cause vomiting and lead to the poison entering the

airways. You can only give the victim 2–3 glasses of water to dilute the acid or alkali and thus reduce their aggressive effects. You should also not neutralize acid in the stomach with alkali and vice versa, as this produces large amounts of carbon dioxide, which leads to distension of the stomach, increased pain and bleeding. If the victim of acid poisoning does not lose consciousness, it is advisable to give him/her a glass of milk, enveloping agents (oat or linseed broth, kissel, the white of raw eggs). If there are signs of suffocation, artificial respiration is performed preferably by «mouth -to- nose» method, since the mucous membrane of the mouth of the victim is burned.

14.2. First aid in drowning

Drowning is an acute pathological condition that develops during accidental or deliberate immersion in water, followed by the development of signs of acute respiratory and acute cardiac failure, the cause of which is the ingress of fluid into the airways.

3 types of drowning in water are distinguished:

1. true (wet);
2. asphyxic (dry);
3. death in water (syncopal type of drowning).

True drowning occurs when water enters the alveoli. The pathogenesis will differ depending on the type of water the drowning occurred in (freshwater or saltwater).

Fresh water rapidly leaves alveoli and penetrates into the vascular bed due to the difference of osmotic gradient with blood. This leads to increase of the CBV and hemodilution, pulmonary edema, erythrocyte hemolysis, reduction of plasma concentration of sodium, chloride and calcium ions, as well as plasma proteins.

In seawater drowning there will be an advantage of seawater gradient over blood, so part of the plasma goes out of the vascular bed, and a decrease in circulating blood mass (up to 45 ml/kg) occurs; hematocrit increases.

Asphyxial drowning occurs without aspiration of water, due to reflex laryngospasm, when the vocal cleft does not allow either water or air. Death comes from mechanical asphyxiation.

Syncopal drowning (death in water) occurs as a result of reflex arrest of cardiac activity and respiration. This type of drowning can occur when the victim is suddenly immersed in cold water.

Clinical signs. In the case of wet drowning, when the victim is rescued immediately after immersion under water, first there is an excited or lethargic state, the skin and lips are pale, breathing is accompanied by coughing; the pulse is rapid; freezing.

The upper abdomen is swollen, and vomiting is not uncommon. If the duration of the final submergence of the victim under water was not more than a few minutes, after pulling out the water the person is unconscious, the skin is cyanotic, foamy pink colored fluid flows from the mouth and nose, the pupils react weakly to light, the jaws are tightly clenched, breathing is intermittent or absent, the pulse is weak, nonrhythmic.

In cases where 2–3 minutes have passed since the victim was finally submerged under water, independent breathing and cardiac activity are usually absent; pupils are dilated and unresponsive to light; the skin is cyanotic. These signs indicate the onset of clinical death.

In *dry drowning*, the skin cyanosis is less pronounced than in wet drowning. Clinical death lasts 4–6 minutes.

Assistance. When rescuing a drowning person, he/she should be taken by the hair and turned face up and swim, not allowing to get caught. Then, as quickly as possible clean the mouth and throat of the drowned person from mucus, silt and sand.

If there is water in the victim's airway, it should be removed quickly by turning him/her over on the stomach, bending over his/her knee so that the head hangs down, and pressing on the back several times. After that, the victim is turned face up and resuscitation starts. If a drowned person is rescued at the initial stage of drowning, it is necessary to take immediate measures to eliminate emotional stress: remove wet clothes, wipe the body dry, calm him/her down.

If the victim is unconscious and has spontaneous breathing, he/she is laid horizontally with the legs lifted at 40–50°; give smelling salts. At the same time the victim should be warmed, provided with resuscitation, cardiac massage; hands and feet should be rubbed.

14.3. First aid in case of heat and/or sunstroke

Heat and/or sunstroke results from prolonged exposure to high temperatures and humidity; exposure to the sun without protective clothing; physical exertion in still, moist air.

Clinical signs that are characteristic of the mild degree: general weakness, malaise, dizziness, nausea, increased thirst, facial skin turns red, sweat, pulse and respiration accelerate; body temperature rises to 37.5–38.9°C.

Moderate degree: body temperature 39–40°C, a severe headache, severe muscle weakness, blurred vision, tinnitus, pain in the heart, marked redness of the skin, heavy sweating, cyanotic lips, pulse rate up to 120–130 beats / min, rapid and shallow breathing. Vomiting and diarrhea are also observed.

Severe degrees of body overheating are classified differently. If the air temperature is high and its humidity is high, then we are talking about heat stroke, if the sun rays acted for a long time – about the sunstroke. Sunstroke can be caused by direct sunlight: the body temperature rises above 40°C, the face reddens, a severe headache, shortness of breath. Then nausea, blurred vision, dizziness, and finally vomiting occur. The patient loses consciousness, convulsions occur, cardiac activity is disturbed, breathing stops.

Assistance. In mild cases, put the victim in the shade, give plenty of fluids. In severe cases, take the victim to a darkened, cool place, undress, wash the body with cool water, apply cold compresses on the head, neck and heart area; cool showers or baths are advisable. Give the victim a cold drink of water. Give to smell ammonia-soaked cotton. If cardiac activity is disturbed and breathing stops, initiate artificial respiration. After first aid, take victim to a medical facility.

To avoid heat stroke and sunstroke, you should cover your head in the heat (wear a hat, panama) and light clothing (preferably made of cotton fabric) that does not prevent the evaporation of sweat. It is important to observe the drinking regimen (preferably plain water). In the heat give preference to vegetable dishes and fermented dairy products.

14.4. First aid in electrical injuries

Electrical shock is damage to the body caused by electric current flowing through the body; an electric arc or lightning strike. Electrical shock, even if not fatal, can cause significant body impairment, which can manifest itself immediately after the shock or hours, days, or even months later.

Shock hazard. The subjective sensations of the victim when an electric current is passed through him/her are varied: a slight jolt, burning pain, convulsive muscle contractions, etc. As a consequence of electric shock, cardiovascular diseases (cardiac arrhythmia, angina pectoris, increased or decreased blood pressure), as well as nervous diseases (neurosis), endocrine disorders, etc. may occur or worsen. Cognitive disorders are possible. Electric shocks are believed to weaken the body's resistance to disease. The skin is pale and cyanotic.

Assistance. First of all, the current must be stopped immediately. In order to free the victim from the action of the electric current, it is necessary to quickly disconnect the section of the electrical network or electrical equipment to which the victim is adjacent. If disconnection is not possible, the victim shall be released from the wire, observing safety rules to prevent exposure to electric current, paying particular attention to the voltage.

If the voltage is up to 1000 V: the wire from the person can be thrown (knocked away) with a dry stick or board. You can pull the victim away from the current source with your hands, wearing dielectric gloves or wrapping them around with dry clothes. It is better to stand on a board, clothes or any other electrically conductive mat (rubber mat).

If the voltage exceeds 1000 V: only an insulated rod or insulated pliers may be used to free the victim, wearing dielectric gloves and dielectric boots.

It is absolutely necessary to remember about self-protection – keep safe distance: electric shock up to 30.000 V – minimum 1.5 m, up to 110.000 V – minimum 2.0 m, up to 220.000 V – minimum 3.0 m, up to 380.000 V – minimum 4.0 m!

Having released the victim from the action of electric current, it is necessary to determine the type and degree of electrical injury as quickly as possible and, depending on this, to provide first aid. The

victim, even with minor injuries, should be at rest. If necessary, mouth-to-mouth respiration and indirect cardiac massage shall be performed until independent breathing and cardiac activity are restored, at least until the arrival of medical personnel at the scene. The areas of electrical shock (burns) are covered with a dry sterile dressing.

Lightning stroke. When struck by lightning, if the victim has not lost consciousness, he/she should be moved indoors, put in bed and warmed, rub the skin of the arms, legs, body, give hot tea or coffee. After that, it is necessary to send him/her to a medical facility.

If the victim is unconscious, he/she is placed on the back, his/her clothes are underlay and the collar is unbuttoned, the belt is loosened. Rub his/her cheeks with alcohol, wipe the chest with a wet towel and sprinkle the face with cold water. Ammonia-soaked cotton is given to sniff. After the victim comes to consciousness, he/she is given strong tea, 15–20 drops of valerian diluted with water and sent to the hospital.

If the victim is not breathing or breathing is shallow, you need to do mouth-to-mouth respiration, and if the pulse is not audible to do chest compressions.

Safety precautions during a thunderstorm. When a thunderstorm approaches, hide indoors, get in your car and close the windows completely. Do not use your cell phone. Stay away from farm machinery and small vehicles (motorcycles, bicycles). If you are swimming or in a boat, get ashore quickly. Avoid telegraph poles or tall trees, and avoid tops of hills. Do not stand near iron fences, high-voltage lines, steel pipes and rails, or near other conductors of electricity. If you are not alone, keep your distance from each other and it is best to lie on the ground.

The list of main abbreviations

BP	– blood pressure;
DBP	– diastolic blood pressure;
BMI	– body mass index;
MPTF	– medical and preventive treatment facility;
MOH	– Ministry of Health;
AO	– abdominal organs;
SBP	– systolic blood pressure;
RR	– respiratory rate;
BI	– brain injury;
CBV	– circulation blood volume
CNS	– central nervous system.

Appendix 1

ALGORITHMS

1. «Blood pressure measuring» algorithm.

Purpose: arterial pressure measurement and evaluation of the resulting data, determination of functional features of the cardiovascular system.

Indications: observation of patient's condition.

Possible complications: painful sensations in the extremity with prolonged arterial compression.

What to be prepared: tonometer, phonendoscope, paper, pen, temperature sheet.

The algorithm of action:

1. Explain to the patient the purpose of the procedure; find out if the procedure has been done before, what the resulting data were; if the patient knows how to behave during the procedure, what the sensations might be.

2. Give the patient a comfortable sitting or lying position in a calm, relaxed pose; the patient's hand is in an unfolded position (palm up) at the same level as the device. The patient should rest and relax (be quiet) for 5 minutes. The blood pressure is usually measured 1–2 times at 2–4 minute intervals.

3. Place the cuff of the tonometer on the patient's bare shoulder 2–3 cm above the elbow at the level of his/her heart, so that one finger passes between them; fasten tightly the cuff on the patient's shoulder with the clasp (hook, adhesive tape), not squeezing the soft tissues.

4. Connect the manometer to the cuff, fixing it to the cuff, check the position of the arrow (mercury column) in relation to the zero mark of the scale.

5. Determine the ulnar artery pulse at the ulnar fossa by placing a phonendoscope at this location (the pressure of the phonendoscope head must be moderate, otherwise the data will be distorted).

6. Close the valve on the bulb and pump air into the cuff with the balloon until the pulsation in the ulnar artery disappears and the

manometer reading is 20–30 mm above normal (or for this patient individually).

7. Unscrew the valve and slowly bleed the air from the cuff, observing the rate of descent of the column or the movement of the arrow: readings may vary at a rate of 2 mm/sec; at the same time listen carefully to the tones in the artery and monitor the manometer readings.

8. Note the pressure gauge readings at the time of the first sounds (tones) (blood pressure at the time of heartbeat – systolic BP) and the time the tones disappear (blood pressure at the time of heart relaxation – diastolic BP), let the air out of the cuff completely.

9. Remove the tonometer cuff from the patient's hand and place it in a sheath.

10. Record the data as a numeric entry on the observation sheet as a fraction (systolic pressure in the numerator, diastolic pressure in the denominator) and on the temperature sheet.

11. Repeat the procedure and compare the data obtained.

12. Disinfect the head of the phonendoscope by wiping it 2 times with 70% alcohol.

13. Inform the patient of the result of the blood pressure measurement.

Important:

- blood pressure is measured on both hands, the values are compared;
- the blood pressure can be measured by the patient himself/herself, teach him/her the rules of blood pressure measurement and interpretation of the data obtained;
- normal BP 120/80 mm – 129/85 mmHg ;
- arterial hypotension 90/60 mm and below;
- arterial hypertension 140/90 mmHg or higher.

2. «Measurement of pulse on the radial artery» algorithm.

Purpose: to determine the basic properties of the pulse, assess the state of the cardiovascular system.

Indications: observation of patient's condition.

Sites for pulse examination: radial, ulnar, carotid, temporal, popliteal, femoral arteries; back side of the foot.

Pulse parameters: rhythm, rate, strength, tension, magnitude.

What to be prepared: clock (stopwatch), paper, red ink pen, temperature sheet.

Algorithm of action:

Explain the procedure to the patient, obtain his/her consent, and find the location sites of the pulse.

2. Give the patient a comfortable position: sitting or lying down in a relaxed comfortable position, in a calm state. The patient should rest (be quiet) for 5 minutes.

3. Perform antiseptic treatment of the hands.

4. Encircle the patient's wrist simultaneously with the fingers of your hands (in the wrist joint area) so that the pads of the 2nd, 3rd, 4th fingers are on the palmar (inner) surface of the forearm in the projection of the radial artery (at the base of the thumb), and place the thumb on the back of the forearm. The radial artery is palpated between the styloid process of the radius and the tendon of the radial muscle.

5. Encircle a section of the radial artery, pressing it lightly against the radial bone, locate the pulsation site, feel the elastic pulsating waves associated with blood movement through the vessel.

6. Compare the periodicity of arterial wall oscillations on the patient's right and left arms. Determine the symmetry of the pulse. Symmetry is the coincidence of pulse beats on both arms in terms of strength (if the pulse is symmetrical, further characterization is given on one arm).

7. Estimate the pulse rhythm.

8. Estimate the pulse rate.

9. Evaluate the strength of the pulse.

10. Estimate the tension of the pulse.

11. Record the pulse examination data on the temperature sheet graphically (in red) and numerically on the observation sheet.

12. Inform the patient the results of the examination.

13. Wash and dry your hands.

Important:

- normally the pulse is rhythmic, equally felt on both hands, its rate in an adult at rest is 60–80 beats per minute;
- pulse rhythm is determined by the intervals between pulse waves.

• If the pulse oscillations of the artery wall occur at the regular intervals, the pulse is rhythmic. With arrhythmias, abnormal alternation of pulse waves is called uneven heart rhythm.

Pulse rate estimation: if the pulse is rhythmic, count the number of pulse waves (beats) for 1 minute, following the time in hours with a stopwatch:

- heart rate is normal: 60–80 beats per minute;
- rapid pulse: > 80 beats per minute – tachycardia;
- low pulse: <60 beats per minute – bradycardia.

Evaluate the pulse strength by the degree of filling of the arteries with blood (depending on the systolic volume of the heart). Full, poorly palpable, thready pulse should be distinguished.

The pulse tension is determined by the force with which you want to press the radial artery to the radial bone until the pulse disappears. Normal tension pulse, high tension pulse (hard) and low tension (soft) pulse should be distinguished.

3. «Respiratory rate count» algorithm.

Purpose: evaluation of patient's condition.

Indications: assessment of the functional state of the respiratory organs.

What to be prepared: a clock with a second hand, temperature sheet, pen with blue rod.

Algorithm of action:

1. Explain the procedure to the patient and get his/her consent.
2. Conduct an antiseptic treatment of the hands.
3. Give the patient a comfortable position (lying down). You need to see the upper part of his/her chest and abdomen. The patient should rest and relax (be quiet) for 5 minutes.
4. With one hand, take the patient's hand in the way similar to the pulse measuring, on the radial artery, to distract his/her attention.
5. Place your hand and the patient's hand on his/her chest (for thoracic type of breathing) or on the epigastric area (for abdominal type of breathing) of the patient.

6. Count the number of breathing movements per minute using a stopwatch (one breathing movement is a breath in and one breathing movement out).

7. Estimate the rate of the breathing movements.

8. Explain to the patient that he/she has been counted the rate of breathing movements, report the results.

9. Wash and dry hands.

10. Record the data on the temperature sheet.

Important:

- respiratory rate count is carried out unnoticed by the patient;
- the number of respiratory movements in 1 minute is called the respiratory rate;
 - in a healthy adult, the respiratory rate at rest is 16–20 per minute;
 - respiratory rate refers to the heart rate as the average of 1: 4;
 - at an increase of body temperature by 1°C the respiratory rate becomes more frequent on 4 respiratory movements;
 - bradypnea is slow breathing with a rate of less than 16 in 1 minute;
 - tachypnea is rapid breathing with a rate of more than 20 in 1 minute.

4. «Measurement of body temperature in the armpit (thermometry)» algorithm.

Purpose: diagnostic – to determine the body temperature of an adult patient.

Indications: monitoring the functional state of the body, prevention of nosocomial infection.

Contraindications: diaper rash, inflammatory processes in the axillary area, hyperemia in the axillary area.

Sites to measure body temperature: armpit, oral cavity, inguinal folds (in children), rectum.

What to be prepared: medical thermometer, tray, tissues, temperature sheet, black ink pen, a watch, temperature log, container with disinfectant, container to store clean thermometers.

Algorithm of action:

1. Explain the purpose and sequence of the procedure to the patient and obtain his/her consent.
2. Perform an antiseptic treatment of the hands.
3. Sit or lay the patient down.
4. Take the thermometer, check it for integrity, look and shake it so that the mercury column falls below 35°C in the reservoir.
5. Examine the armpit area: if local inflammation is present, the temperature should not be measured (the thermometer reading will be higher than the body temperature).
6. Wipe the skin of the patient's armpit dry with an individual tissue (wet skin will distort the thermometer reading).
7. Place the thermometer with the mercury reservoir in the armpit so that it is in full contact with the body (ask the patient to press the shoulder against the chest).
8. Record the time of the body temperature measurement.
9. Remove the thermometer after 10 minutes and determine its reading from the height of the mercury column standing.
10. Record the thermometer reading in the temperature log as a digital record and in the temperature sheet as a graphical curve (in black).
11. Report the measurement results to the patient.
12. Shake the used thermometer and make sure the mercury has sunk into the reservoir.
13. Disinfect the used thermometer: rinse the thermometer under running water until the smell of disinfectant is gone, wipe dry with a tissue, place it in a tray or container on a tissue and store it dry.
14. Wash and dry hands.

5. «Cardiopulmonary resuscitation with the use of an AED» algorithm.

Basic resuscitation measures during cardiopulmonary resuscitation (CPR) with the use of an **AED (automatic external defibrillator)** have the following sequence:

1. Before assisting, make sure that the rescuer, the victim and other persons present are not in danger.

2. Determine the presence of consciousness: the rescuer gently shakes the victim by the shoulder and speaks loudly to him/her: "Are you all right? How are you feeling?" To determine consciousness it is forbidden: to press on the victim's eyes, to poke him/her with sharp objects.

3. If the victim is in consciousness:

- if the victim is not threatened, he/she is left in the same position;
- clarify the nature of the event that has occurred and call an ambulance;
- do not leave the victim unattended, periodically assess his or her condition.

4. If the victim is unconscious:

- the rescuer asks those around the victim for help;
- if necessary, the rescuer returns the victim to his or her back, restores his or her airway patency.

5. The rescuer, keeping the victim's airway open, determines the presence of breathing using the «hear, see, feel» triple technique. Determine the presence of breathing for 10 seconds. If breathing is normal, at least 2–3 breaths are usually determined during this time. For several minutes after cardiac arrest, the victim may still be breathing weakly or have single noisy breaths. It is not necessary to check the pulse to determine the victim's vital signs; the rescuer should be limited to determining the presence of breathing.

6. If the victim is breathing normally (16–18 breaths per minute), the victim is transferred to a stable position.

7. If breathing is absent or irregular, the rescuer asks someone to go get help and/or bring an AED.

8. If no one is around, the rescuer calls for an ambulance and/or brings an AED. The rescuer does not leave the victim unattended until medical assistance arrives and monitors his/her vital signs.

9. If the rescuer is alone, he/she immediately uses an AED:

- the defibrillator lid must be opened. Usually after this, the device turns on by itself, if not, the rescuer presses the button to turn it on;
- after the machine is turned on, it will immediately start giving voice commands. Strictly follow the commands of the machine;

- stick the electrodes on the victim's chest and wait for the machine to analyze the rhythm, then, if necessary, press the discharge button to defibrillate.

10. The rescuer never touches the victim when performing rhythm analysis with the machine or when performing defibrillation. The rescuer defibrillates only after he/she has made sure that no one touches the victim.

11. Immediately after performing defibrillation, the rescuer initiates CPR at 30 chest compressions: 2 breaths ratio.

- the rescuer kneels at the side of the victim;
- the rescuer determines the place of compression on the victim's chest and places the hands there;
- apply pressure with a depth of at least 5 (no more than 6 cm) at a frequency of 100 (no more than 120) per minute. Do not remove your hands from the thorax while compressing. With each subsequent compression, allow the thorax to return to its original position.

12. Rescuer performs two breaths (pre restores patency of the victim's airway):

- clasp the victim's nostrils with one hand;
- the rescuer exhales evenly (as in normal breathing) into the victim's mouth for one second (while observing the movement of his/her chest) and allows the victim's chest to return to its original position;
- after that, immediately performs a second breath. It should take no more than 5 seconds to take two breaths. The rescuer performs artificial respiration using protective equipment: valve mask, breathing mask, etc.

13. Immediately after performing two breaths, the rescuer continues chest compressions and performs CPR again according to the above recommendations (30:2).

14. After two minutes, the defibrillator will automatically reassess the victim's rhythm. The rescuer should act on its vocal prompts and, if necessary, perform defibrillation.

- if the defibrillator model does not provide automatic activation after 2 minutes (i.e. after 5–6 cycles of 30:2 CPR), the rescuer should turn it on himself/herself.

15. If CPR is performed by two rescuers: the first one starts CPR 30:2; the second one brings and prepares the automatic defibrillator for use:

- the first rescuer does not stop chest compression while the second rescuer attaches the electrodes. The chest compressions are only stopped when the defibrillator analyzes the heart rhythm, as instructed by the defibrillator, no matter how many presses are applied;
- rescuers use the time when the defibrillator is analyzing the rhythm (every 2 minutes of CPR) to replace each other (chest compression is physically exhausting manipulation).

16. AED is used during the whole time of CPR. There are no limitations in the number of defibrillations.

17. If the defibrillator does not recommend defibrillation after cardiac rhythm analysis, continue performing 30:2 CPR, in accordance with the above recommendations.

18. If the victim has resumed breathing and independent heart function, the rescuer moves him/her to a stable position without removing the electrodes and closely monitors the victim's condition. The rescuers, if necessary, are ready to continue performing CPR.

6. «Cardiopulmonary resuscitation without the use of an AED» algorithm.

Basic resuscitation measures during cardiopulmonary resuscitation (CPR) without the use of an AED have the following sequence:

1. Before assisting, make sure that the rescuer, the victim and other persons present are not in danger.

2. Determine the presence of consciousness: the rescuer gently shakes the victim by the shoulder and speaks loudly to him/her: "Are you all right? How are you feeling?" To determine consciousness it is forbidden: to press on the victim's eyes, to poke him/her with sharp objects.

3. If the victim is in consciousness:

- if the victim is not threatened, he/she is left in the same position;
 - clarify the nature of the event that has occurred and call an ambulance;
 - do not leave the victim unattended, periodically assess his or her condition.
4. If the victim is unconsciousness:
- the rescuer turns to those around him or her for help;
 - if necessary, the rescuer returns the victim to his or her back, restores his or her airway patency.
5. The rescuer, keeping the victim's airway open, determines the presence of breathing using the "hear, see, feel" triple technique. Determine the presence of breathing for 10 seconds. If breathing is normal, at least 2–3 breaths are usually determined during this time. For several minutes after cardiac arrest, the victim may still be breathing weakly or have single noisy breaths. It is not necessary to check the pulse to determine the victim's vital signs; the rescuer should be limited to determining the presence of breathing.
6. If the victim is breathing normally (16–18 breaths per minute), the victim is transferred to a stable position.
7. If breathing is absent or irregular, the rescuer asks someone to go get help.
8. If no one is around, the rescuer calls for an ambulance.
9. The rescuer does not leave the victim unattended until medical assistance arrives and monitors his/her vital signs.
10. If the rescuer assists himself/herself, he/she immediately begins CPR at a ratio of 30 chest compressions: 2 breaths (30:2) ration:
- the rescuer kneels at the side of the victim;
 - the rescuer determines the place of compression on the victim's chest and places the hands there;
 - compressions with a depth of at least 5 (no more than 6 cm) are performed with a frequency of 100 (no more than 120) per minute. Do not remove your hands from the thorax while compressing. With each subsequent compress allow the thorax to return to its original position.
11. The rescuer performs 2 breaths (first restoring the airway patency of the victim).

- clasp the victim's nostrils with one hand;
- the rescuer exhales evenly (as in normal breathing) into the victim's mouth for one second (while observing the movement of his/her chest) and allows the victim's chest to return to its original position;
- after that, immediately performs a second breath. It should take no more than 5 seconds to take two breaths. The rescuer performs artificial respiration using protective equipment: valve mask, breathing mask, etc.

12. Immediately after performing defibrillation, the rescuer initiates CPR at a ratio of 30 compressions: 2 breaths.

13. If CPR is performed by two rescuers: the first starts indirect cardiac massage, the second performs CPR, the ratio is 30:2.

14. If the victim has resumed breathing and independent heartbeat, the rescuer puts him/her in a stable position and closely monitors the victim's condition. Rescuers are ready to continue performing CPR, if necessary.

7. «First aid in drowning» algorithm.

Sequence:

1. Before assisting, make sure that the rescuer, the victim and other persons present are not endangered.

2. If the drowning person is in consciences, one should throw him/her a life-saving device (lifebuoy, ball, etc.).

3. If a lifeguard swims to help a drowning person, a lifejacket or other means should be used to keep him/her in the water (lifebelt, inflatable mattress, etc.). It is necessary to swim to the drowning person from the back. When approaching a drowning person, it is important to ask him/her to calm down and explain that you are able to help them.

4. If the drowning person is unconscious and in the water, turns him/her over to the back and check for breathing:

4.1 If the victim is breathing, transport him/her to the shore as quickly as possible. When pulling the victim out of the water, 2–3 people should be involved, if possible. On the shore, check breathing,

call 103 (112), move the victim to a stable position and cover him/her with a thermoblanket or a blanket.

4.2 If the victim is not breathing, artificial respiration can be performed directly in the water only if the airway of the victim is restored and the rescuer is safe.

4.3 If the victim in the water is not breathing after the restoration of airway patency, rescue breathing (10 breaths) must be performed within one minute. If the victim is not breathing on his/her own after this, the rescuer's next steps depend on the distance to shore. If it is possible, swim to shore in less than 5 minutes. If it is possible to reach the shore sooner than 5 minutes, CPR should be continued as the victim approaches the shore. If this time exceeds 5 min perform CPR for the next minute and then swim to shore without performing CPR. Chest compressions in water are ineffective.

5. There is no need to clear the airway of water: a small amount of water enters the lungs and quickly passes into the circulatory system. No pressure should be applied to the abdomen, nor should the victim be turned upside down to remove water from the lungs. If breathing is absent, CPR should be initiated immediately.

6. If AED is available, electrodes should be applied (dry the skin of the thorax before applying the electrodes) and the device should be turned on. Defibrillation should be performed according to the voice instructions of the AED. If the victim is hypothermic with a body temperature below 30°C, limit the number of defibrillations to three. The next attempts can be made after the victim's body temperature has risen above 30°C.

7. Drowning victims often vomit during CPR. It is necessary to tilt the victim's head sideways and remove vomit mass from the mouth cavity. If a cervical spine injury is suspected, the victim should be returned to the side, keeping the head, neck and torso aligned. Several rescuers are needed to perform this manipulation.

Appendix 2

CONTROL QUESTIONS TO SECTIONS

Control questions to Section 1.

1. Describe the main historical facts of the formation of medical care for a sick person.
2. Describe the main historical data on the organization of health care in Ukraine.
3. Give a definition of the role and place of the patient care in the treatment and diagnostic process.
4. Give a definition of the structure and conditions concept of patients care in a therapeutic department.
5. Describe the moral, ethical and deontological principles of the medical specialist formation.
6. Give the definitions of the main professional responsibilities of junior nursing staff in the polyclinics and departments of the hospital.
7. Describe the main deontological basics of the professional activity of a medical staff.
8. Describe the principles of professional subordination in the system: doctor -> nurse -> junior medical personnel.
9. Describe the professional relationship between the medical personnel and the patients.
10. Describe the professional relationship between the doctor and the nurse.

Control questions to Section 2.

1. What is the main purpose of the admission department?
2. What is a centralized and decentralized admissions department?
3. Determine the stages sequence of the admissions department work.

4. What documents does the admissions department nurse fill in?
5. How the hair should be treated when head lice are detected?
6. What does the definition of the patient's anthropometric data consist of?
7. How to correctly measure the circumference of the chest?
8. What technical equipment are used to transport the patients?
9. What does the concept of "medical protection regime" mean and what activities are used to comply with it?
10. What does the sanitary-hygienic regime of the department mean and what are the requirements for its implementation?

Control questions to Section 3.

1. What rooms does the therapy department have?
2. How is the ward nurse post equipped?
3. What does the hygienic care in the department include?
4. What modes of physical activity should be followed in hospitals?
5. What is the sanitary and epidemiological regime in the medical department?
6. What are the duties of a nurse in the internal medicine department?
7. What are the responsibilities of the junior nurse of the therapy department?
8. What does the concept of "personal hygiene of the patient" include?
9. What is the daily regimen of the patients in the therapeutic department?
10. How does the bed linen and underwear have to be changed?

Control questions to Section 4.

1. What does the questioning (interviewing) of the patient include?
2. Name the main complaints of a patient with cardiovascular disease.
3. Name the main complaints of a patient with respiratory system pathology.
4. Name the main complaints of a patient with a pathology of the digestive system.
5. Name the main complaints of a patient with a pathology of the urinary system.

6. What does the life history (Anamnesis vitae) include?
7. What does the medical history (Anamnesis morbi) include?
8. How to assess the general condition of the patient?
9. What are the deontological principles of interviewing a patient?
10. What is the name of the medical documentation that is filled out on the basis of the patient's questioning?

Control questions to Section 5.

1. What is a patient examination and to which group of diagnostic methods does it belong?
2. What should be the conditions for the general examination of the patient?
3. What should attention be paid to during the general examination of the patient (name it)?
4. What types of the general condition of the patient do you know? Give their characteristics.
5. What types of consciousness impairment do you know? Give a description of them.
6. How is the position of the patient in bed can be characterized? Give a description of the active, passive and forced position of the patient.
7. What are the constitutional types and their characteristics?
8. What should you look for when examining patient's skin?
9. In what cases does the moisture and skin turgor change?
10. What is body mass index?

Control questions to Section 6.

1. What processes in the organism does the body temperature reflects?
2. What physiological mechanisms provide the constancy of the human body temperature (temperature homeostasis)?
3. What are the normal values of body temperature in the axillary area, rectum, and mouth?
4. What is the role of body temperature measurement in patients on hospital treatment?

5. What are the main biorhythmic features of daily temperature fluctuations in a healthy person in physiological conditions?
6. What is the diagnostic value of daily temperature registration in patients?
7. What types of fever do you know?
8. What are the dietary features of a patient with high temperature?
9. What are the measures for caring for patients with fever?

Control questions to Section 7.

1. Give the definition of the pulse.
2. Name the characteristics of the pulse.
3. How to examine the pulse in the radial arteries? Normal pulse characteristics.
4. Give the definition of the blood pressure.
5. Technique for measuring blood pressure. Blood pressure norm.
6. What is the first first aid to the patients with a decreased and increased blood pressure?
7. What are the basic rules for stopping bleeding from arterial and venous vessels? How to apply a hemostatic tourniquet?
8. What are the basic rules for determining the frequency, depth, type, rhythm of breathing?
9. What are the normal indicators of respiratory rate?
10. What is the first aid for patients with coughing, shortness of breath and choking?

Control questions to Section 8.

1. How are medications classified according to the method of administration?
2. What forms of medicines are there?
3. What are the rules for the distribution of tablets and liquid medicines for oral administration?
4. What is the external way of using medication?
5. What is the enteral way of drug administration?
6. What is the inhalation method of drug administration and indications for use?

7. Describe the technique of intramuscular injection.
8. Describe the method of performing subcutaneous injections and show on a dummy.
9. What is the purpose of carrying out intradermal injections and describe the technique of it performing.
10. What is the sequence in which the IV infusion is prepared?

Control questions to Section 9.

1. What are the indications and contraindications for the use of mustard plasters?
2. What are the indications and contraindications for the use of cans?
3. What is the duration of the use of mustard plasters?
4. On what areas of the skin can mustard plasters be applied?
5. What complications can occur when using mustard plasters (cans)?
6. What is the purpose of using compresses?
7. What medicines are used for compresses?
8. What are the indications and contraindications for the use of a heating pad?
9. When is an ice pack used?
10. What is the mechanism of influence of cold and heat procedures on the body?

Control questions to Section 10.

1. What is «diet nutrition»?
2. What is a portioner, its compilation and use?
3. What treatment diets were used before 2013?
4. What groups are patients divided depending on their nutritional status according to the new protocol?
5. What are the nutritional norms for 1 patient, depending on the nutritional status?
6. Technique for performing enteral and parenteral nutrition.
7. Indications for enteral and parenteral nutrition.
8. Contraindications for enteral and parenteral nutrition.
9. Technique of feeding a seriously ill patient.
10. What is a food enema?

Control questions to Section 11.

1. How often should bed linen and underwear be changed?
2. How to ensure the physiological needs of the patient in the lying position?
3. What treatment needs to be done after using the urinal or bedpan?
4. How is sponging-down of the patient in a severe state can be performed?
5. How is nail and hair care performed in seriously ill patients?
6. How is eye care performed in seriously ill patients?
7. How is oral care performed in seriously ill patients?
8. How is nasal and ear canal care performed in seriously ill patients?
9. What are bedsores?
10. What activities for the prevention of bedsores do you know?

Control questions to Section 12.

1. Definition and characteristics of clinical death.
2. The concept of biological death.
3. What are the additional methods for diagnosing the clinical death?
4. What is the sequence of resuscitation activities in case of clinical death?
5. What are the methods of restoring and maintaining the passability of the upper respiratory tract?
6. What are the types and methods of artificial ventilation by expiratory methods?
7. What are the simplest devices for artificial ventilation of the lungs you know?
8. What is the technique of external heart massage?
9. How is the effectiveness of resuscitation measures can be monitored?
10. What are the possible complications during resuscitation and their prevention?

Control questions to Section 13.

1. What is resuscitation?
2. How is chest compressions performed?

3. Name the types of external bleeding and their signs.
4. What are the indications for gastric lavage?
5. What is the principle used when performing a siphon enema?
6. Give a definition to the concept of transport immobilization?
7. What is defined by the concept of "parenteral" method of drug administration?
8. What types of parenteral drug administration do you know?
9. Technique for performing of intravenous injections.
10. What is the method for measuring blood pressure?

Control questions to Section 14.

1. Types of poisoning. What treatment activities does emergency medical care include for acute poisoning?
2. The is the concept of heatstroke and what can cause it?
3. What is typical for a mild form of overheating of the body?
4. What is typical for a severe form of overheating of the body?
5. Give a definition of the term «sunstroke».
6. What does emergency care for sunstroke include?
7. Give a definition of the term "drowning". What are the types of drowning?
8. What types of drowning do you know and what is their basis?
9. Give a definition of the term "electrical burns".
10. What does emergency care for an electrical injury include?

Appendix 3

TEST TASKS

TEST TASKS TO SECTION 1.

- 1. Give a definition of the term «nursing»:**
 - A. This is a set of activities aimed at relieving the patient's condition and providing his successful treatment;
 - B. This is a set of activities aimed at provide a stable condition of the patient and a quick discharge from the hospital;
 - C. This is a set of activities aimed to provide urgent surgical treatment;
 - D. This is a complex of actions that is carried out by persons without medical education.

- 2. Determine what kind of activities the patient's care provide:**
 - A. Creation of proper hygienic conditions and providing the uncomplicated course of the disease and the acceleration of the patient's recovery;
 - B. Relief of the patient's suffering, detection and prevention of complications of the disease;
 - C. Implementation of medical appointments;
 - D. All of the above is true.

- 3. To provide the organization of patient care, medical personnel must:**
 - A. Have relevant knowledge and skills;
 - B. Be familiar with the methods of care;
 - C. Possess the basic principles of medical deontology;
 - D. All of the above is true.

4. Who is responsible for providing the patient care activities?

- A. Junior nurse;
- B. Senior nurse;
- C. Doctor and head of the department;
- D. The patient himself is responsible for the implementation of the care measures.

5. The following are involved in providing the organization of patient care:

- A. Medical professionals;
- B. Only nursing staff who are familiar with the methods of care;
- C. Only junior medical personnel with appropriate training;
- D. Only a physician with relevant knowledge and basic principles of medical deontology.

6. Patient care is divided into:

- A. Specialized and generalized;
- B. General and Special;
- C. Necessary and on demand;
- D. All answers are correct.

7. Indicate the main characteristics of general patient care.

- A. General care provides activities of patient care, applied to any patient, regardless of the type and nature of his illness;
- B. This is the sum of such measures that all patients require, regardless of the nature of their disease (pathology), age, gender;
- C. These are the actions of medical personnel related to the specifics of the disease or the nature of the injury and their treatment;
- D. The correct answers are A and B.

8. The main directions of general activities of patient care are:

- A. Hygienic regimen maintenance of the room, bed and furniture, the patient himself, his clothes, dishes, toilet items;
- B. Strict fulfillment of all doctor's prescriptions (adherence to the technique of performing procedures and the scheme of drug administration);

- C. Monitoring the course of the disease, the patient's condition and informing the doctor about changes in his condition, feeding the patient;
- D. All answers are correct.

9. What measures involves general patient care:

- A. Creation of a hygienic environment around the patient and his service;
- B. Observing patients and carrying out preventive activities;
- C. Implementation of medical appointments and medical records;
- D. All answers are correct.

10. Special care is the actions of medical personnel, what:

- A. Associated with the specifics of the actual disease or injury and their treatment, apply only to patients with certain diseases (surgical, infectious, urological, gynecological, mental, etc.);
- B. Assumes care measures that can be applied to any patient, regardless of the type and nature of his illness;
- C. Ensure the fulfillment of medical appointments and medical records;
- D. All answers are correct.

TEST TASKS TO SECTION 2.

1. Which of the solutions is used for disinfection of the bath after the patient's sanitization?

- A. 0.5% clarified bleach solution;
- B. 0.5% solution of hexachlorane;
- C. 2% chloramine solution;
- D. 0.5% chloramine solution.

2. What are the functions of the admissions department?

- A. Reception, registration, sanitization and hygienic processing, transportation of patients to the specialized department;
- B. Sanitization and hygienic processing, carrying out instrumental methods of examination, carrying out manipulations;

- C. Reception, registration, ECG recording, feeding seriously ill patients;
- D. Reception, registration, examination by a doctor, gastric lavage.

3. What is included in the admission department?

- A. Doctor's office, laboratory, ECG room, treatment room;
- B. Rooms for the reception and registration of patients, a doctor's office, an isolation ward, a sanitary checkpoint, a treatment room;
- C. Offices of reception and registration of patients, isolation ward, office of the head;
- D. Sanitary checkpoint, pulmonologist's office, ECG-room, treatment room.

4. What kind of documentation is filled out in the registration room?

- A. Case history, discharge epicrisis, register of material values, what was taken to storage from the patient;
- B. Medical history, exchange card, prescription letter, statistical coupon;
- C. Medical history, patient admission log and hospitalization refusals, exchange card, inventory log of material values, what was taken to storage from the patient;
- D. Journal of patient admission and hospitalization refusals, register of material values, what was taken for storage from the patient, for radiography of the OGK, observation diary.

5. What are the indicators for anthropometric data?

- A. Height, body weight, chest x-ray;
- B. Body weight, blood pressure, ECG;
- C. Height, body temperature, pulse;
- D. Height, body weight, chest and head circumference.

6. A patient with the pediculosis of the scalp was revealed in the admission department. Which pest control agent should be used to treat hair:

- A. 0.5% solution of karbofos;

- B. 0.5% solution of dikresil;
- C. 5% methylacetophos ointment, then cover the head with a cellophane scarf for 15 minutes. Then wash the hair with warm water and rinse with 6% vinegar solution;
- D. 10% camphor solution, a mixture of 70% ethyl alcohol solution, 1% alcohol solution of salicylic acid.

7. The patient was admitted to the emergency department in a state of severe cardiovascular insufficiency. How much sanitization is shown to the patient?

- A. Partial sanitization by wiping the face and exposed parts of the body with a towel moistened with an water solution of vinegar. In case of exacerbation of cardiovascular insufficiency, the patient is urgently, without sanitization, sent to the intensive care unit;
- B. Complete sanitization using a hygienic bath;
- C. Complete sanitization of use with a contrast shower;
- D. Partial sanitization with head lice prophylaxis.

8. What should be the temperature of the hygienic bath?

- A. 31–32°C;
- B. 33–34°C;
- C. 35–36°C;
- D. 37–38°C;

9. What thermometer is used to measure the temperature of the water in a hygienic bath?

- A. Mercury medical thermometer;
- B. Liquid crystal thermometer;
- C. Alcohol thermometer in a case;
- D. Electrothermometer.

10. A patient was admitted to the emergency department with suspected gastrointestinal bleeding (3 hours ago there was vomiting of «coffee grounds»). The patient feels satisfactory, can move independently. How to transport a patient to the department?

- A. On foot, accompanied by a nurse;

- B. In a wheelchair;
- C. Only on a gurney in a lying position;
- D. Independently.

TEST TASKS TO SECTION 3.

1. The patient is in bed. He cannot turn over on his own, raise his head, arms, legs. What is the name of this position?

- A. Active;
- B. Passive;
- C. Forced active;
- D. Forced passive.

2. Which of the following is used to reduce bad smell from the mouth?

- A. 0.1% solution of carbolic acid;
- B. 2% sodium bicarbonate solution;
- C. 5% solution of vinegar;
- D. 1% solution of lapis (silver nitrate).

3. What is the first sign of bedsores:

- A. Bruises on the body;
- B. Redness of the skin on protruding places;
- C. Very significant pallor of the skin;
- D. Decrease in skin temperature in places of formation of bedsores.

4. Why can't the backing rubber circle be inflated too much?

- A. It will break soon;
- B. The circle will lose its equilibrium position in bed;
- C. The circle should change its shape when the patient moves;
- D. The patient will not be comfortable.

5. How many times a day should hygienic cleaning of rooms and household items be carry out:

- A. Once in a day;
- B. Twice;

- C. Three times;
- D. Every other day.

6. What device is used to instill drops in the ear?

- A. Syringe with a capacity of 1 ml;
- B. Pipette;
- C. Syringe Janet;
- D. Dropper.

7. The patient's condition is severe, he is not allowed to move. How many times a day does the patient need to change bed linen and underwear?

- A. 1 time;
- B. 2 times;
- C. 3 times;
- D. If necessary.

8. What products are used for hygienic nose care?

- A. Dry cotton ball;
- B. Dry cotton-gauze turunda;
- C. Turunda, moistened with vaseline oil;
- D. Turunda moistened with 3% boric alcohol.

9. What is the purpose of the bedside tables?

- A. For storage of medicines;
- B. For storing the patient's outerwear;
- C. For storage of personal hygiene items of the patient;
- D. For storage of outer clothing and personal hygiene items of the patient.

10. For how many beds is the nursing post designed for?

- A. 25–30;
- B. 50–60;
- C. 8–10;
- D. 16–20;

TEST TASKS TO SECTION 4.

1. When interviewing a patient, the past diseases are described in the section:

- A. In the history of life;
- B. In the history of the development of the disease;
- C. When questioning the patient by systems;
- D. In the patient's complaints.

2. To which section of the patient's interview does the complaint of suffocation belong:

- A. Complaints of the patient;
- B. Detailing of complaints;
- C. Surveys by system;
- D. History of the development of the disease.

3. What section of the anamnesis is called a medical biography?

- A. The main complaints of the patient;
- B. Secondary complaints of the patient;
- C. Life history (Anamnesis vite);
- D. Medical history (Anamnesis morbi).

4. To which section of the anamnesis does the complaint about significant weight loss belong?

- A. Inquiries on general state of the patient;
- B. Complaints of the patient;
- C. Life history (Anamnesis vite);
- D. Medical history (Anamnesis morbi);

5. A detailed description of the study of each complaint of the patient is recorded in the next chapter of the medical history:

- A. Surveys by system;
- B. Detailing of complaints;
- C. History of the development of the disease;
- D. Complaints of the patient.

6. In which section of the anamnesis, when interviewing a patient, the bad habits should be described?

- A. In complaints;
- B. History of illness (Anamnesis morbi);
- C. History of life (Anamnesis vite);
- D. When studying secondary complaints of the patient.

7. In what sequence is the questioning of the patient carried out?

- A. Complaints, medical history (Anamnesis morbi), life history (Anamnesis vite);
- B. Allergic, family, hereditary, gynecological history;
- C. All diseases transferred in chronological order;
- D. Passport part, complaints, inquiries on systems, medical history (Anamnesis morbi) and life history (Anamnesis vite).

8. With what system should you start inquiries about organs and systems?

- A. Doesn't matter;
- B. With the cardiovascular system;
- C. With the one to which the patient complains;
- D. With the respiratory system, especially in winter;

9. What is the definition of main complaints?

- A. Complaints which characterizes of the main pathology;
- B. Complaints accompanying concomitant disease;
- C. General complaints (weakness, decreased appetite, poor sleep);
- D. Shortness of breath, cough, hemoptysis, chest pain, fever.

10. What are general complaints?

- A. Complaints which characterize the main disease;
- B. Complaints related to dysfunction of the nervous system;
- C. Complaints which characterizes the concomitant disease;
- D. Complaints, which characterizes the most diseases (for example, weakness, feeling unwell, nervous lability, etc.).

TEST TASKS TO SECTION 5.

1. Under what type of lighting the general examination of the patient is carried out:

- A. Diffuse solar or intense diffused artificial lighting;
- B. Direct sunlight or yellow artificial lighting;
- C. In the darkness;
- D. In any light.

2. The satisfactory condition of the patient is characterized by:

- A. Moderate painful manifestations of the disease, inexpressive deterioration in well-being, active position in bed;
- B. Expressive manifestations of the pathological process, forced or passive position of the patient in bed;
- C. Signs of clinical death;
- D. Expressive disorders of the functional activity of various organs and systems, a significant decrease in working capacity, unfavorable dynamics of the disease.

3. A seriously ill patient is examined in the position:

- A. Standing;
- B. Sitting;
- C. Lying;
- D. At the request of the patient.

4. Stupor is:

- A. Collapse;
- B. Impaired consciousness;
- C. Short height;
- D. Change in mood.

5. Which of the following is not a type of pathological walking?

- A. Ataxic;
- B. Paretic;
- C. Cerebellar;
- D. Peripheral.

- 6. What types of patient's position in bed are determined:**
- A. Active, good, negative;
 - B. Sitting, lying;
 - C. Such types do not exist;
 - D. Active, passive, forced.
- 7. Which of the following is considered as a constitutional type?**
- A. Asthenic;
 - B. Systolic;
 - C. Melancholic;
 - D. Classic.
- 8. Height is measured by using:**
- A. Weights;
 - B. Centimeter;
 - C. Stadiometer;
 - D. Rulers.
- 9. The data of the general examination of the patient are recorded in:**
- A. Patient register;
 - B. Temperature sheet;
 - C. Medical history;
 - D. Statistical coupon.
- 10. Select the correct BMI formula from the following:**
- A. $\text{Height (m)}^2 / \text{body weight (kg)}$;
 - B. $\text{Body weight (kg)} + \text{height (m)}^2$;
 - C. $\text{Body weight (kg)} - \text{height (m)}^2$;
 - D. $\text{Body weight (kg)} / \text{height (m)}^2$.

TEST TASKS TO SECTION 6.

- 1. For how many beats the pulse accelerates when the body temperature rises by 1°C:**
- A. For 5 beats;
 - B. For 8–10 beats;

- C. For 1 beat;
- D. For 12 beats.

2. Where does the nurse record the daily body temperature of the patients?

- A. In the temperature sheet;
- B. In the history of the disease (title page);
- C. In the card of a retired from the hospital;
- D. In the list of directions.

3. Select indicators of subfebrile temperature:

- A. Temperature 36.6–37.6°C;
- B. Temperature 37.0–38.0°C;
- C. Temperature 38.0–38.5°C;
- D. Temperature 39.0–40.0°C.

4. For what purpose the axillary area should be dried and cleaned of sweat before measuring the temperature with a mercury thermometer?

- A. Ensuring hygienic conditions for the procedure;
- B. Prevent the patient's body from hypothermia;
- C. Ensuring the highest measurement accuracy;
- D. In order to better fix the thermometer.

5. What temperature drop is called lytic?

- A. Cascade-like;
- B. Undulating;
- C. Gradual;
- D. Sudden.

6. How long does it take to measure the temperature in the axillary area with a medical thermometer?

- A. By 5 minutes;
- B. By 10 minutes;
- C. By 15 minutes;
- D. By 20 minutes.

7. Daily temperature fluctuations in a patient are 4–5°C. What type of fever is characterized by such fluctuations?

- A. Fever of the hectic type;
- B. Wave-like fever;
- B. Fever of a persistent type;
- D. Fever of irregular type;

8. What system, first of all, suffers during a crisis decrease in body temperature?

- A. Nervous;
- B. Digestive;
- C. Respiratory;
- D. Cardiovascular.

9. How does the body temperature change after eating?

- A. Rises;
- B. Decreases;
- C. Decreases in a specific area;
- D. Does not change.

10. Select from the suggested range the normal body temperature:

- A. 35.5–36.6°C;
- B. 36.4–36.9°C;
- C. 36.6°C;
- D. 36.0–37.0°C;

TEST TASKS TO SECTION 7.

1. A patient with circulatory insufficiency suddenly has an attack of suffocation. What measures should the nurse take?

- A. Give the patient a half-sitting position;
- B. Provide oxygen inhalation;
- C. Urgently inform the doctor;
- D. All of the above.

2. On what arteries the patient's pulse is most often examined?

- A. Elbow;
- B. Radial;
- C. Inguinal;
- D. Femoral.

3. From the following list of conditions, select those in which blood pressure rises (normaly):

- A. Physical activity;
- B. Emotional stress;
- C. Eating;
- D. All of the above.

4. When measuring blood pressure in a patient, an increasement of it up to 180/90 mm.Hg. was recorded. What is the normal systolic pressure?

- A. 120–140 mm Hg.;
- B. 100–139 mm Hg.;
- C. 90–110 mm Hg.;
- D. 80–90 mm Hg.

5. When examining the pulse on the patient's radial arteries, a heart rate of 100 beats per minute was found. What is the normal heart rate?

- A. 60–80 in 1 min.;
- B. 50–59 in 1 min.;
- V. 70–100 in 1 min.;
- G. 100 in 1 min.

6. The frequency of respiratory movements in a healthy person ranges:

- A. 8–12 in 1 min.;
- B. 12–16 in 1 min.;
- C. 16–20 in 1 min.;
- D. 20–25 in 1 min.

7. What type of breathing do women have?

- A. Thoracic;
- B. Abdominal;
- C. Mixed;
- D. Orthopnea.

8. A 80-year-old patient after a traumatic brain injury developed convulsions, short stops of breathing sometimes were replaced by several deep breaths. What type of breathing did the patient have?

- A. Cheyne-Stokes';
- B. Grokk's;
- C. Biot's;
- D. Kussmaul's.

9. In the laying position, what is the normal number of respiratory movements:

- A. Decreases to 10–11 in 1 min;
- B. Decreases to 14–16 in 1 min;
- C. Increases to 25 in 1 min;
- D. Decreases to 10 in 1 min.

10. The patient's blood pressure is measured for the first time in his life. Which hand should you choose to measure?

- A. Left;
- B. Right;
- C. Both;
- D. The one that is closer.

TEST TASKS TO SECTION 8.

1. What method of drug administration is called parenteral:

- A. The use of drugs by injection;
- B. Introduction of drugs into the body bypassing the gastrointestinal tract;
- C. External use of drugs;
- D. Administration of drugs through the mucous membranes.

2. In what cases the medications are prescribed after a meal:

- A. If they irritate the stomach mucouse membrane;
- B. If they take part in digestion;
- C. If they are destroyed by the action of hydrochloric acid of gastric juice and enzymes;
- D. In patients with swallowing disorders.

3. What complications are associated with violation of the rules of aseptics and antiseptics during injections:

- A. Air and fat embolism;
- B. Allergic reactions;
- C. Development of post-infection infiltrates and abscesses;
- D. Disease with viral hepatitis.

4. Intramuscular injections are performed:

- A. In the subscapularis;
- B. In the upper outer square of the buttocks;
- C. In the middle of the outer surface of the shoulder;
- D. In the middle of the inner surface of the forearm.

5. How to check if the needle is in the vein when giving intravenous injections:

- A. Check the pulse;
- B. Ask the patient about the state of well-being;
- C. Pull the piston towards yourself;
- D. Remove the needle from the syringe;

6. What is the frequency of use of a sterile system for intravenous infusion:

- A. Double entry;
- B. Disposable;
- C. Three times;
- D. Multiple;

7. To what depth has the injection needle to be inserted during the intradermal injection:

- A. 0.1–0.2 cm;
- B. 0.9–1 cm;
- C. 0.6–0.8 cm;
- D. 0.3–0.5 cm.

8. What speed should be used to deliver the oxygen through an individual inhaler:

- A. 2–3 liters in 1 minute;
- B. 8–9 liters in 1 minute;
- C. 6–7 liters in 1 minute;
- D. 4–5 liters in 1 minute.

9. The parenteral route of drug administration is:

- A. The use of drugs by injection;
- B. Introduction of drugs into the body bypassing the gastrointestinal tract;
- C. External use of drugs;
- D. Administration of drugs through the rectum.

10. Where should be kept the medicines of groups «A» and «B»:

- A. In the safe;
- B. At the nursing post;
- C. In the treatment room;
- D. In the closet.

TEST TASKS TO SECTION 9.

1. Under what pathological conditions the use of mustard plasters is contraindicated:

- A. Inflammation of the bronchi;
- B. Inflammation of the lungs;
- C. Lung tumor;
- D. Muscle inflammation;

2. Applying of an ice pack is indicated:

- A. With pneumonia;
- B. With bleeding;
- C. After the introduction of the oil solution;
- D. With chronic cholecystitis;

3. Indications for the use of a warming compress are:

- A. Joint inflammation;
- B. Allergic skin diseases;
- C. Bruise;
- D. Insect bites;

4. The average duration of the use of mustard plasters is:

- A. 15–20 minutes;
- B. 20–25 minutes;
- C. 10–15 minutes;
- D. 5–10 minutes.

5. What should be applied in case of nose bleeding:

- A. Warming compress;
- B. Cold compress;
- C. Hot water bottle;
- D. Mustard plasters.

6. At what distance from each other the medical glass cups should be placed on the patient's body:

- A. 2–3 cm;
- B. 3–4 cm;
- C. 4–5 cm;
- D. 5–6 cm.

7. What is the duration of the cold compress application:

- A. 15–20 minutes;
- B. No more than 30 minutes;
- C. Not more than 1 hour;
- D. Not more than 2 hours.

8. What remedy with physical influence can be applied to patients with renal colic:

- A. Medical glass cups;
- B. Hot water bottle;
- C. Ice pack;
- D. Cold compress.

9. The indications for the use of a cold compress include everything except:

- A. Inflammatory diseases of the joints;
- B. Nosebleeds;
- C. Bruise;
- D. Insect bites.

10. Contraindications to the use of medical glass cups are:

- A. Myositis;
- B. Bleeding predisposition;
- C. Bronchitis;
- D. Neuritis.

TEST TASKS TO SECTION 10.

1. The volume of the food enema should not exceed:

- A. 200 ml of a nutrient mixture;
- B. 100 ml of nutrient mixture;
- C. 50 ml of a nutrient mixture;
- D. 500 ml of nutrient mixture.

2. The energy value of food for hypertrophy is:

- A. 2400 – 2700 kcal / day;
- B. 2400 – 2200 kcal / day;
- C. 1900 – 2000 kcal / day;
- D. 1900 – 2200 kcal / day.

3. What is the number of the Order «On the improvement of the organization of medical nutrition and the work of the dietary system in Ukraine».

- A. No. 228;
- B. No. 931;
- C. No. 552;
- D. No. 798.

4. According to the classification of nutritional status, hypotrophic has:

- A. BMI 15–18.5;
 - B. BMI 18.5–25.0;
 - C. BMI 25–30;
 - D. BMI <30.
- *BMI – Body Mass Index

5. Where are the instructions posted with the list of products that are allowed/not allowed to be handed over to the patient in the hospital:

- A. In the ward;
- B. In the corridor;
- C. At the post of a nurse;
- D. In the reception area and waiting room.

6. According to the classification of nutritional status, the normotrophic has:

- A. BMI 15–18.5;
 - B. BMI 18.5 – 25.0;
 - C. BMI 25 – 30;
 - D. BMI <30.
- *BMI – Body Mass Index

7. According to the classification of nutritional status, hypertrophy has:

- A. BMI 15–18.5;
- B. BMI 18.5 – 25.0;

- C. BMI 25 – 30;
 - D. BMI > 30.
- *BMI – Body Mass Index

8. The energy value of food for normotrophy is:

- A. 2400 – 2700 kcal / day;
- B. 2400 – 2200 kcal / day;
- C. 1900 – 2000 kcal / day;
- D. 1900 – 2200 kcal / day.

9. The energy value of food for hypotrophy is:

- A. 2400 – 2700 kcal / day;
- B. 2400 – 2200 kcal / day;
- C. 1900 – 2000 kcal / day;
- D. 1900 – 2200 kcal / day.

10. Whose responsibilities include the preparation of the portions in the department:

- A. Nutritionist;
- B. Post nurse;
- C. Senior nurse;
- D. Head of the department.

TEST TASKS TO SECTION 11.

1. Care of the oral cavity in severely ill patients includes:

- A. Washing with 0.5% sodium bicarbonate solution or 0.9% sodium chloride solution or a weak solution of potassium permanganate;
- B. Cleaning teeth and gums with toothpastes according to the dentist's recommendations;
- C. Rinsing the mouth with clean boiled water, if necessary with the addition of 2–3 ml of 40% ethyl alcohol;
- D. Cleaning the teeth and gums with a gauze pad with the toothpaste, followed by rinsing;

2. Eye care for seriously ill patients includes:

- A. Washing of the eyelids with a cotton pad, moistened with soapy water, followed by rinsing the eyes with boiled water;
- B. Washing of eyelids with a cotton pad, dipped in a 2% solution of boric acid, followed by rinsing with boiled water or 0.9% sodium chloride solution;
- C. Washing of the eyelids with a cotton pad, moistened with soapy water, followed by rinsing the eyes with boiled water with the addition of a weak solution of potassium permanganate;
- D. Washing of eyelids with a cotton swab dipped in a 2% solution of boric acid, followed by rinsing with boiled water or a weak solution of potassium permanganate.

3. It is advisable to trim nails for a seriously ill patient:

- A. once every two weeks;
- B. At least once a week;
- C. 1 time in three weeks;
- D. If necessary;

4. For wiping the skin of seriously ill patients, use the following antiseptic agents:

- A. 10% camphor solution, a mixture of 70% ethyl alcohol solution, 1% alcohol solution of salicylic acid;
- B. Soap solution, 10% camphor solution, mixture of 70% ethyl alcohol solution, 1% alcohol solution of salicylic acid;
- C. 10% camphor solution, a mixture of 70% ethyl alcohol solution, 1% alcoholic salicylic acid solution, 1% chloramine solution;
- D. Soap solution, a mixture of 70% ethyl alcohol solution, 1% alcohol solution of salicylic acid, solutions with the addition of vegetable oils.

5. For what longest period of time the underwear may stay on the body of a seriously ill patient in the absence of contamination?

- A. 1 day;
- B. 3 days;
- C. 7 days;
- D. 10 days.

6. The hygiene of a bed of a seriously ill patient should include:

- A. Perform daily cleaning with moist clean rags and periodically – with 3% chloramine solution or lysol;
- B. Daily cleaning with moist, clean rags;
- C. Daily treatment with 3% chloramine solution or lysol;
- D. Treatment with a 3% solution of chloramine or lysol 1 time in two days;

7. The concept of "bed comfort" is:

- A. Providing preparation of a bed for a seriously ill patient and monitoring the condition of bed linen;
- B. Using methods to smooth the sheets on the patient's bed in order to prevent wrinkles as a cause of bedsores;
- C. Timely change of bed linen and underwear;
- D. Providing a comfortable position of the patient in bed;

8. In the process of development of bedsores has:

- A. Three stages;
- B. Four stages;
- C. Five stages;
- D. Two stages.

9. How is it necessary to clean the urinals, bed pans after the excretions of bedridden patients?

- A. Wash with hot water, no specific cleaning is required;
- B. Wash with hot water daily, from time to time rinse with a disinfectant solution: 3–5% chloramine, 5% carbolic acid, lysol or 20% bleach;
- C. Wash with hot water and rinse with a disinfectant solution: 3–5% chloramine, 5% carbolic acid, lysol or 20% bleach;
- D. Wash with hot water daily, once a week, soak in a disinfectant solution: 3–5% chloramine, 5% carbolic acid, lysol or 20% bleach.

10. The junior nurse should be at the bedside of a seriously ill person who is dying:

- A. Almost constantly;
- B. Approach every 30 minutes;
- C. Approach every 15 minutes;
- D. Use only as directed by your doctor.

TEST TASKS TO SECTION 12.

1. Clinical death is characterized by:

- A. Stop of breathing, the presence of pulse and pupillary reflex, anaerobic glycolysis;
- B. Stop of the activity of the heart, respiration, lack of reflexes and metabolism;
- C. Stop of heart activity, gasping respiration, pupillary reflex, aerobic glycolysis;
- D. Stop of activity of the heart, respiration, lack of reflexes, anaerobic glycolysis.

2. Additional signs of clinical death do not include:

- A. Change in skin color (gray or bluish);
- B. Lack of consciousness;
- C. Lack of reflexes and loss of muscle tone;
- D. The time between the stop of blood circulation and the beginning of resuscitation is more than 3 minutes.

3. Conducting artificial respiration according to the «mouth-to-mouth» or «mouth-to-nose» method by the resuscitator provides for:

- A. For 2 breaths for 30 heart compressions;
- B. 2–3 breaths for 2–6 heart compressions;
- C. 2–3 breaths for 4–8 cardiac compressions;
- D. 1 exhalation for 5 heart compressions.

4. Time should be spent on the statement of clinical death:

- A. No more than 7–8 seconds;

- B. No more than 10 seconds;
- C. Not more than 5 seconds;
- D. No more than 30 seconds.

5. The activities to ensure airway passability do not include the following actions of the resuscitator:

- A. Opens the victim's mouth and insert a finger, wrapped in a handkerchief or a gauze napkin, frees the mouth from existing foreign bodies and liquids (vomit, sputum, algae, dentures, blood clots, etc.);
- B. Displays the lower jaw anteriorly. The passability of the upper respiratory tract is restored in other cases;
- C. Tilts his head back as much as possible, placing a bolster under the victim's neck (for example, your own forearm). Moreover, in most of the victims, the upper respiratory tract is freed from the tongue and its root, with restoring of its the passability;
- D. The victim is placed on the back on a hard surface, preferably with the upper body lowered.

6. The first stage of cardiopulmonary resuscitation can be carried out by:

- A. A trained person, not necessarily a medical professional;
- B. Resuscitation physician;
- C. Nurse;
- D. All answers are correct.

7. You have started the implementation of the measures of the first stage of cardiopulmonary resuscitation. Every 2 minutes you evaluate its effectiveness in terms of parameters. What of the parameters, it is not appropriate for the assessment:

- A. The reaction of the pupils to light in the form of constriction;
- B. Normalization of skin color;
- C. Feeling under the fingers of arterial pulsation, synchronous with a closed heart massage;
- D. Determination of blood pressure.

8. How long does it take for cadaveric spots to appear on the body during biological death?

- A. After 1 hour;
- B. After 2 hours;
- C. After 3 hours;
- D. After 4 hours.

9. On the street, an unconscious man lies, who looks 57–60 years old. On examination, you discover the presence of irregular external respiration with the participation of the auxiliary muscles, a weak pulse is palpable on the carotid artery. Witnesses claim that the man fell a few minutes ago. Algorithm of action?

- A. Call the ambulance team and wait for her arrival;
- B. Loosen the collar of the victim's shirt, free the neck, sprinkle water on the face, inhale ammonia (if there any);
- C. Lay the patient on a firm horizontal surface, prepare the upper respiratory tract, start artificial respiration and closed heart massage;
- D. Do not carry out resuscitation measures, since the cause and time of death are unknown;

10. After a long-term serious illness, the patient's blood pressure decreased (60/40 mm Hg), tachycardia, shortness of breath, shallow breathing are observed, consciousness is unclear. This condition can be viewed as:

- A. Peredagonal;
- B. Agony;
- C. Shock;
- D. Clinical death.

TEST TASKS TO SECTION 13.

1. Which of these symptoms are characteristic of the state of clinical death?

- A. Consciousness is not lost;
- B. Lack of consciousness;

- C. There is no consciousness;
- D. None of the above;

2. Signs of the correct conduct of resuscitation activities are all, EXCEPT:

- A. Constriction of the pupils;
- B. Normalization of skin color;
- C. Feeling under the fingers of arterial pulsation, synchronous with indirect cardiac massage;
- D. Pupil dilation.

3. What is the optimal position of the patient for resuscitation – mouth-to-mouth breathing and chest compressions?

- A. On the right side with the head laid back;
- B. Half-sitting in a wheelchair;
- C. Horizontal on the back;
- D. Doesn't matter;

4. To stop venous bleeding, you must:

- A. Apply a pressure bandage;
- B. Apply a tourniquet;
- C. Press the artery along;
- D. Bend the limb at the joint.

5. For what period of time can a tourniquet be applied to stop arterial bleeding in winter?

- A. No more than 30 minutes;
- B. Not more than 1 hour;
- B. Not more than 2 hours;
- D. Not more than 3 hours.

6. For what period of time can a tourniquet be applied to stop arterial bleeding in the summer?

- A. No more than 30 minutes;
- B. Not more than 1 hour;
- C. Not more than 2 hours;
- D. Not more than 3 hours.

7. Transport immobilization is used for:

- A. Reducing pain;
- B. Convenient transportation of the patient;
- C. Stopping bleeding;
- D. Restrictions of movement.

8. For a siphon enema use:

- A. 10–15 l. of boiled water;
- B. Hypertonic solution 1–2 l.;
- C. 3–4 l. of boiled water;
- D. 1 – 2 l. of boiled water.

9. If there is a signs for vomit during the insertion of a probe for gastric lavage, it is needed to:

- A. Remove the probe immediately;
- B. Introduce antiemetic drugs to the patient through a probe;
- C. Continue sounding no matter what;
- D. Recommend to breathe through the nose.

10. Complications of subcutaneous injections can be:

- A. Formation of inflammatory and suppurative processes at the injection site (abscess, phlegmon);
- B. Damage of the nerve trunks;
- C. Fatty degeneration of the subcutaneous tissue;
- D. Inflammation of the walls of the vein.

TEST TASKS TO SECTION 14.

1. If a poison enters the gastrointestinal tract, immediately perform the following actions:

- A. Immediately remove saliva and mucus from the victim's mouth;
- B. Immediately wash the stomach of the victim for several times until the clean wash water appear;
- C. Give the victim 2–3 glasses of water;

D. Artificial respiration is performed, preferably by mouth-to-nose method.

2. Asphyxial drowning is based on:

- A. Bronchospasm;
- B. Acute cardiovascular failure;
- C. Reflex laryngospasm;
- D. Alveolar pulmonary edema.

3. There are the following types of drowning:

- A. Asphyxia (dry), true (wet);
- B. True (wet), asphyxial (dry), syncope type (death in water);
- C. True (wet), asphyxial (dry), arrhythmic;
- D. Asphyxia (dry), syncope, anaphylactic type.

4. True drowning is based on:

- A. Reflex laryngospasm;
- B. Reflex cardiac arrest;
- C. Ingress of water into the alveoli;
- D. Reflex bronchospasm.

5. Syncope type of drowning occurs as a result of:

- A. Ingress of water into the alveoli;
- B. Reflex cardiac arrest;
- C. Reflex laryngospasm;
- D. Increased intracranial pressure.

6. Early signs of heatstroke are:

- A. General weakness, headache, nausea;
- B. Hallucinations, loss of consciousness;
- C. Increase in body temperature to 39–40 ° C;
- D. The appearance of erythema.

7. The simplest and most effective way to restore blood circulation is:

- A. Closed heart massage with compulsory mechanical ventilation;
- B. Closed heart massage without mechanical ventilation;

- C. Direct cardiac massage;
- D. Defibrillation.

8. First aid for sunstroke includes:

- A. Artificial respiration;
- B. Transfer the victim to a cool, protected from sunlight place and apply a cold compress or container with ice to the head;
- C. Indirect cardiac massage;
- D. Prescribing painkillers.

9. What lesions of the cardiovascular system occur during the electrical trauma:

- A. Violation of heart rhythm and conduction, asystole;
- B. Pulmonary edema;
- C. Myocardial infarction;
- D. Acute cardiovascular failure associated with weakening of the left ventricular myocardium.

10. What is meant by the term "emergency":

- A. The state of clinical death;
- B. Period of agony;
- C. Borderline state between life and death;
- D. Period of dying.

Answers to the tests

Tests answers to Section 1.

1-A; 2-B; 3-D; 4-C; 5-A; 6-B; 7-D; 8-D; 9-D; 10-A.

Tests answers to Section 2.

1-A; 2-A; 3-C; 4-C; 5-D; 6-C; 7-A; 8-C; 9-C; 10-B.

Tests answers to Section 3.

1-D; 2-B; 3-B; 4-C; 5-C; 6-B; 7-D; 8-C; 9-C; 10-A.

Tests answers to Section 4.

1-A; 2-A; 3-D; 4-A; 5-B; 6-C; 7-C; 8-C; 9-A; 10-B.

Tests answers to Section 5.

1-A; 2-A; 3-C; 4-B; 5-D; 6-D; 7-A; 8-C; 9-C; 10-D.

Tests answers to Section 6.

1-B; 2-C; 3-B; 4-C; 5-C; 6-B; 7-A; 8-D; 9-A; 10-B.

Tests answers to Section 7.

1-D; 2-B; 3-D; 4-B; 5-A; 6-C; 7-A; 8-A; 9-B; 10-C.

Tests answers to Section 8.

1-B; 2-A; 3-C; 4-B; 5-C; 6-B; 7-D; 8-D; 9-B; 10-A.

Tests answers to Section 9.

1-C; 2-B; 3-A; 4-C; 5-B; 6-A; 7-C; 8-B; 9-A; 10-B.

Tests answers to Section 10.

1-A; 2-C; 3-B; 4-A; 5-D; 6-B; 7-C; 8-B; 9-A; 10-B.

Tests answers to Section 11.

1-A; 2-B; 3-B; 4-A; 5-D; 6-A; 7-D; 8-B; 9-C; 10-A.

Tests answers to Section 12.

1-D; 2-D; 3-A; 4-A; 5-D; 6-D; 7-D; 8-B; 9-C; 10-A.

Tests answers to Section 13.

1-C; 2-D; 3-C; 4-A; 5-B; 6-C; 7-A; 8-A; 9-D; 10-A.

Tests answers to Section 14.

1-A; 2-C; 3-B; 4-C; 5-B; 6-A; 7-A; 8-B; 9-A; 10-C.

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Навчальне видання

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ДОГЛЯД ЗА ХВОРИМИ

Практика

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Свідоцтво про внесення суб'єкта видавничої справи
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У підручнику викладено основні аспекти терапевтичного догляду за хворими на сучасному теоретичному та практичному рівні; викладена техніка медичних маніпуляцій. Розглянуто принципи організації терапевтичного режиму та догляду за хворими, навички виконання необхідних медичних маніпуляцій.