MINISTRY OF PUBLIC HEALTH OF UKRAINE
ZAPOROZHE STATE MEDICAL UNIVERSITY
DEPARTMENT OF GENERAL PRACTICE – FAMILY MEDICINE

ORGANIZATIONAL ASPECTS OF PRIMARY HEALTH CARE IN UKRAINE

STUDY GUIDE

Zaporizhzhia
2018

Recommended for publication by Academic Council
of Zaporizhzhia State Medical University as a study guide
(Protocol № 8 of .20.03.2018)

Authors:

N. S. Mykhailovska - Doctor of Medical Sciences, Professor, head of General practice – family medicine department, Zaporozhye State Medical University;

A. V. Grytsay - PhD, associated professor of General practice – family medicine department, Zaporozhye State Medical University.

L. E. Miniailenko - assistant, department of general practice – family medicine, Zaporozhye State Medical University.

Readers:

I. M. Fushtey – prorector for scientific work, department of therapy, clinical pharmacology and endocrinology, Zaporozhye medical academy of postgraduate education MRH of Ukraine, Doctor of Medical Sciences, Professor;

Koval O. A. - Doctor of Medical Sciences, Professor of Hospital therapy № 3 department, Dnepropetrovsk State Medical Academy MoH of Ukraine.

Mykhailovska N. S.

M99 Organizational aspects of primary health care system in Ukraine: study guide for the practical classes and individual work for 6th-years students of international faculty (speciality «General medicine») Discipline «General practice – family medicine» / N. S. Mykhailovska, A. V. Grytsay, L. E. Miniailenko – Zaporizhzhia : ZSMU, 2018. – 175 p.

Study guide compiled in accordance with the program of «General practice - family medicine». Guidelines are intended to help students prepare for practical classes and learn the material. Can be used for training of 6th-years students of international faculty, discipline «General practice - family medicine».

Михайловська Н. С.

Організаційні аспекти первинної медико-санітарної допомоги в Украіні: навчально-методичний посібник до практичних занять та самостійної роботи студентів VI курсу міжнародного факультету (спеціальність «Лікувальна справа») з дисципліни «Загальна практика - сімейна медицина» / Н. С. Михайловська, А. В. Грицай. Л. Є. Міняйленко - Запоріжжя: ЗДМУ, 2018. – 175 с.

Навчальний посібник складений відповідно до програми «Загальна практика - сімейна медицина». Видання має на меті сприяти кращому засвоєнню теоретичних знань студентами під час підготовки до практичних занять. Посібник рекомендований для використання студентами VI курсу міжнародного факультету з дисципліни «Загальна практика - сімейна медицина».

CONTENT

PREFACE

Primary healthcare refers to essential health care that is easily accessible to all members of the community and, at the same time, uses socially acceptable methods and scientifically sound technology, which makes it universal. Primary healthcare is an approach to health beyond the traditional health care system that focuses on health equity-producing social policy. It includes all areas that play a role in health, such as access to health services, environment and lifestyle. Thus, primary healthcare and public health measures, taken together, may be considered as the cornerstones of universal health systems. The primary health care approach has seen significant gains in health were applied even when adverse economic and political conditions prevail.

The mastering of principles of general practice is important for doctors of all specialities.

This textbook was developed by department of General practice – family medicine, Zaporozhye State Medical University for the training of specialists in the educational qualification level "Specialist" qualification "Doctor" in higher educational institutions of III - IV levels of accreditation of Ukraine in the specialties 7.12010001 «General medicine», 7.12010002 «Pediatrics», approved by the order of the Ministry of Health of Ukraine dated 08.07.2010 № 539 with changes in accordance with the model plan from April 20, 2015 and in accordance with the academic program on discipline "General practice (family medicine)" training of specialists of educational qualification level specialist (approved by the CMC MOH of December 26, 2014). This textbook includes educational material for academic discipline «General practice – family medicine».

Materials appearing in this textbook covered the general information, work program for academic discipline «General practice – family medicine», training manuals, tests collection, and methodical recommendations.

The textbook is descriptive and well-conceived. It is designed for getting the basic knowledge about the main principles of general practice - family medicine. The textbook consider basic sections of academic discipline.

THE THEMATIC PLAN OF PRACTICAL CLASSES

Module 1. «Organizational aspects of primary health care system in ukraine, priority role of family medicine in the public health system».

№	Topic	Number of hours
1	The structure of a Public health system and the place of the family medicine in it, basic principles of the family medical care. The organization of work of the family doctor. Information support of FD ambulatories and centers. General principles of information processing of family doctor's outpatient clinic. Electronic patient registration systems. The telemedicine in the practice of FD.	4
2	The principles and types of medical insurance, the activity of FD. The conception and features of palliative care. The principles and methods of palliative care. The palliative care in out-patient settings. The care of patients with uncurable diseases in the practice of FD, co-work with spetialists.	4
3	Medico-social aspects of the population’s health. The immunoprophylaxis. The preventive activity of FD. Screening program of medical examination. The stratification of risk, risk factors control for main non-epidemic diseases. The principles of rehabilitation according K. Gutenbrunner.	4
4	The chronic non-epidemic diseases. The alhorhytm of FD in the case of cardio-vascular diseases. The method and assessment of ECG.	4
5	The alhorhytm of FD in the case of pulmonary and urogenital diseases. The pickflowmetry.	4
6	The alhorhytm of FD in the case of endocrinological and gastrointestinal diseases.	4
7	The organization of emergency in the practice of FD. The emergency in the case of sudden death, seizures, loss of consciousness on the pre-admission stage.	4
8	Final module control. Defence of the individual works.	2
	Total	30

THE THEMATIC PLAN OF INDEPENDENT WORK OF STUDENT
On-line course «The principles of therapy of out-patients with widespread internal diseases»

№	*The topic*	*hours*	*Control*
Content module 1. The management plan of out-patients widespread internal diseases			
1	The risk factors and screening of main chronic non-epidemic diseases. The prevention in the practice of family doctor.	5	Current control during practical classes
2	The expertise of disability in the case of main chronic non-epidemic diseases.	12	-„-
3	The prophylactic medical check-up, rehabilitation and resort treatment	4,5	-„-
4	The principles of dentist care during pregnancy	3,5	-„-
5	The ethical and deontological aspects of family doctors activity	3	-„-
	Total	28	-„-
Content module 2. The preventive program and curing of widespread diseases of children under 5 years old			
6	The risk factors and screening of main chronic non-epidemic diseases in children.	4	-„-
7	The preventive program of epidemic diseases and vaccination plan for children under 5 years old.	4	-„-
8	Syndromological curing approach for children under 5 years old.	4	-„-
	Total	12	-„-
Content module 3. Organization and provision of urgent medical care at the hospital stage in the practice of a family doctor			
9	Emergency in the case of pain syndrome in the practice of family doctor	5	-„-
10	Emergency in the case of stings and bites in the practice of family doctor.	4	-„-
11	Emergency in the case of electrical injury and drowning in the practice of family doctor	5	-„-
12	Emergency in the case of frostbite and thermal injury in the practice of family doctor	4	-„-
	Total	18	
13	**The preparation for final module control**	**2**	
	Total	**60**	

TOPIC 1
THE STRUCTURE OF A PUBLIC HEALTH SYSTEM AND THE PLACE OF THE FAMILY MEDICINE IN IT, BASIC PRINCIPLES OF THE FAMILY MEDICAL CARE. THE ORGANIZATION OF WORK OF THE FAMILY DOCTOR. INFORMATION SUPPORT OF FD AMBULATORIES AND CENTERS. GENERAL PRINCIPLES OF INFORMATION PROCESSING OF FAMILY DOCTOR'S OUTPATIENT CLINIC. ELECTRONIC PATIENT REGISTRATION SYSTEMS. THE TELEMEDICINE IN THE PRACTICE OF FD

I. Theme actuality. According WHO, the family medicine is the system of Public health which has to provide personal, complex and life-long care for the individual as a part of a the family and the community. This is economically feasible system. The family doctor has particular skills in treating people with multiple health issues.

The primary medical care is reforming according to world standards of Public health. The aim of State program of primary health care (PHC) development is to lower the morbidity rate, to lower the number of disabled among the population and to decrease the mortality by effective work of family doctors [5].

The family medicine is a provision for continuing care of patients of any age and sex. A set of skills of family doctor may define a basic diagnosis and treatment of common illnesses and medical conditions, referral to specialists, formulates a plan for further testing, treatment and life style changes, patient education including self-care skills, use of the screening tests and immunization programs.

The family doctor is specialized in family medicine after the medical degree. He is needs to provide life-long and complex health care for the individual, his family, his community not depending on age, gender, diseases, he is able to manage a wide number of acute, chronic and preventive medical care services and also a preventive care and health promotion, knows how to coordinate care provided by other subspecialists [5].

II. Study purposes: take up questions of place of family medicine in the general structure of Public health, the principles of family maintenance of population, have a notion about organization of work of family doctor.

III. Concrete purposes of the module:

- The main principles, the advantages and disadvantages of the PHC.
- The organizational forms of PHC.
- The principles of the family medical care.
- The recording medical documentation in the setting of PHC.
- The main functions and content of work of the FD.
- The specifics of work of the FD.
- The specifics of the communication between the FD and the patient, his family.
- The psychogeny, the deontological aspects of the FD's work.
- Solving of the medico-social problems of the family.
- Epidemiological and biostatistical aspects of GP-FM.
- The automatization in the GP-FM guide.
- The automatization in the prophylactic medical check-up and rehabilitation of patients.
- The automatization in the analysis of functional examinations.
- The telemedicine in the practice of FD.
- The evidence-based medicine as a methodology of FD's work

IV. A student must be able to use basis of legislation of Ukraine about a Public health and normative documents which regulate activity of bodies and establishments of Public health, to estimate the basic indexes of health of population, to organize work of out-patient and hospital establishments, to organize work of emergency.

V. Task for initial independent training

1. What is the definition if the Health protection?

A. A system of measures, sent to provision, maintenance and development of physiology and its functions,optimal physical capacity and social activity of individual.

B. A system of establishments which provide a health protection of population.

C. A control system by the guard of health of population.

D. A system of the medical provision.

E. A system of primary medical help.

2. What are the main targets of a medical help?

A. Help to the persons with acute diseases, opening of new Public health establishments of, rehabilitation work.

B. Help to the persons with chronic diseases and increase of sanitary culture

C. Provision of spa treatment, improvement of sanitary culture

D. Decreasing of morbidity and disability, increase of sanitary culture, rehabilitation patients and invalids, help to the persons with chronic diseases, opening of new Public health establishments

E. Opening of new institutions of Public health, help to the persons with chronic diseases, rehabilitation patients and invalids.

3. Public health Establishments are the following:

A. Establishments which provide the management of health a guard

B. Enterprise, establishments and organizations of Public health and medical provision which provide the different requirements of population in industry

C. Establishments of medical care for population

D. Social establishments for be single and elderly people.

E. All of the above mentioned

4. The body of Public health is:

A. Establishments which provide the management of health a guard

B. Enterprise, establishments and organizations of Public health and medical provision which provide the different requirements of population in industry

C. Establishments of medical care for population

D. Social establishments for be single and elderly people.

E. All of the above mentioned

5. Principles of Public health include all of the below listed, except:

A. Freedom of charge for all types of medical care;

B. Freedom of charge for medical care which is conducted within the framework of the government program;

C. Priority role of prophylactic care;

D. easy access to medical help;

E. Social security of citizens in case of healthimpairment.

6. The disclosure of information which makes a medical secret is shut out:

A. On-request the bodies of social security and public welfare;

B. The threat of distribution of infectious diseases;

C. At presence of signs, which allow thinking that it is sorry to the health caused during realization of socially dangerous actions;

D. On-request descendants;

E. On-request the office of public prosecutor.

7. The basic principles of Public health include all, except:

A. Freedom of charge for all types of medical care;

B. Freedom of charge for medical care which is conducted within the framework of the government program;

C. Priority role of prophylactic care;

D. easy access to medical help;

E. Social security of citizens in case of loss of health.

8. How many forms of compounding function there are today in the practice of family doctor:

A. 2

B. 4

C. 3

D. 1

E. no correct answer.

9. Who has right to give consent to medical intervention?

A. Attending doctor;

B. Head of the department;

C. Patient or his legal representative;

D. Administration of institution, where a patient works;

E. Paramedical worker.

10. The disclosure of information which makes a medical secret is shut out:

A. On-request the bodies of social security and public welfare;

B. The threat of distribution of infectious diseases;

C. At presence of signs, which allow thinking that it is sorry to the health caused during realization of socially dangerous actions;

D. On-request descendants;

E. On-request the office of public prosecutor.

Answers:

1	2	3	4	5	6	7	8	9	10
A	**C**	**B**	**A**	**E**	**A**	**E**	**C**	**C**	**A**

VI. Basic questions after a theme

1. The main principles, the advantages and disadvantages of the PHC.
2. The organizational forms of PHC.
3. The principles of the family medical care.
4. The recording medical documentation in the setting of PHC.
5. The main functions and content of work of the FD.
6. The specifics of work of the FD.
7. The specifics of the communication between the FD and the patient, his family.
8. The psychogeny, the deontological aspects of the FD’s work.
9. Solving of the medico-social problems of the family.
10. Epidemiological and biostatistical aspects of GP-FM.
11. The automatization in the GP-FM guide.
12. The automatization in the prophylactic medical check-up and rehabilitation of patients.
13. The automatization in the analysis of functional examinations.
14. The telemedicine in the practice of FD.
15. The evidence-based medicine as a methodology of FD’s work
16. The main principles and the advantages of the new model of PHC.

VII. Practical skills

Practical class is in out-patient's clinic; students together with family doctors perform the consultation of patients; analyze interrelation of doctor with a patient and his family, study basic functions and maintenance of work of family doctor, fill basic registration documentation of family doctor

1. To design the passport of district in out-patient's clinic.

2. To fill the medical passport of family.

3. To design the informed consent of patient, specify the basic points of document.

The content of theme

In the conditions of adaptation of Public health in Ukraine to the new economic relations to the primary medical help a leading role is taken in the medical provision of population. Management disbalance among bodies and establishments of the medical provision and crisis of health of population is all not only unsatisfactorily affected the state of health of Ukrainian population but also on activity of the system of health protection. Therefore a change will allow in Ukraine of the existent system of health protection, first of all, pointing effort at the improvement of primary medico-sanitary help, as to foundation of the system of the medical provision. It will allow carrying out modification orientation of activity on a primary level and will distinguish for him maximally possible to the shot. Material and financial resources, taking into account those which are freed from secondary and tertiary levels [5].

Primary care is the term which stands for the system of providers of the health services who act within a health care system as the principal point of consultation for patients. According to the WHO, the essential primary care is an integral component and the cornerstone of an inclusive strategy considering primary health care services.

Primary care involves the wide range of the patients groups, which include the the patients of all ages, patients of different geographic origins and level of material well-being, patients who seek prevention and patients with different acute and chronic diseases, which include physical, mental,social or other health issues[2].

In case if the patient cannot be managed on the primary level because of the the nature of his or her health condition, the patient should be referred for secondary or tertiary level care.

As a specialist in the field of primary care, family doctor must have a wide range of knowledge in many areas.

One of the most important parts of the FD's practice is a continuity of a medical help, because patients usually prefer to consult the same doctor for all of their health issues such as: routine check-ups and preventive care, lifestyle management and health education, initial consultation about a new health problems.

It is important to include the collaboration among the doctors, who provide a primary care for the patients.

There is a standardized tool in primary care system, which can be used for understanding and analyzing information on interventions by the reason for the patient visit − the International Classification of Primary Care.

Common chronic illnesses such as arterial hypertension, angina pectoris, different endocrinological issues (such as diabetes, thyroid dysfunction and other) care asthma, depression and anxiety, back pain, arthritis are usually treated at the primary level.

Family doctor's work also includes the following issues as family planning services and vaccinations as the part of basic maternal and child health care services [2,5].

In both developed and developing countries the demand for primary care services is expected to increase because of the global population ageing and increasing numbers of older adults who are more likely to develop a wide range of chronic non-communicable diseases.

Very soon the general practitioners - family doctors (GP – FD), as the main part in the system of the primary health care will achieve the rey role in the process of reformation of the public health system in the whole world.

According to the data given by the WHO, the primary health care system ids supposed to cover the basic medical care (including simple diagnostic procedures and treatment, referral to the higher levels in difficult cases, preventive care) [5].

The first level of contact between an individual, the family or community and the national health care system is the primary medical care; as the first stage in the community health protection it should easily accessible at the place of residence or at the place of work in case if the medical and social care is needed.

According to the Wold health organization, the primary health care development as the basis of the public health care plays the main role in the efficiency, effectiveness and justice of the health care system, because the principle of generally accessibility of the medical care, which is important for the people, can be realized only within the scope of the primary health care.

Family medicine (**FM**) is a medical specialty, which is designed for comprehensive health care provision to the people of all ages.

Family medicine, as division of primary care, provides continuing and comprehensive health care that for the individual and family not depending on age, sex or the character of the disease.

The main scope of the family medicine is the knowledge of the patient as a part of the family and the community, and also the preventive care and health promotion.

The **World Organization of Family Doctors** (Wonca) states the following aims of family medicine: to provide personal, complex and continuing care for the individual as the part of the family and the community [2,5].

Primary care ethics is the number of issues of values which underlying this practice.

The term "family medicine" is used more often in many countries Europea and Asia, instead of "general medicine" or "general practice“.

But sometimes it can be refferd as general practice in Europe, because of its holistic nature andits roots in the family.

Every day family physicians deal with the wide range of acute and chronic deseases and provide preventive medical care services.

Preventive care measures that can be provided by the family doctor include the following:

a. routine check-ups,
b. health-risk assessments,
c. basic screening tests, which can be performed quickly, immunization measures
d. personalized approach to the healthy lifestyle management.

A primary care physician should be able to accomplish a set of skills, generally including basic diagnosis and treatment of common diseases and medical conditions [5].

Basic diagnostic techniques include the following: interviewing the patient in order to collect information on the present symptoms or prior medical history, asking for other health details, that may be important and after that − a complex physical examination.

FD's skills also include medical testing, such as interpreting results of the patient's samples and tests, electrocardiograms, or X-Rays [5].

In order to make risky procedure safer for the patient sometimes the referral to specialists may be needed (in case of more complex and time-intensive diagnostic procedures, due to either special training with a technology, or increased experience or patient volume).

FD is usually the first medical practitioner contacted by a patient, due to ease of communication, accessible location, familiarity and prices for the medical services and changes to the care requirements.

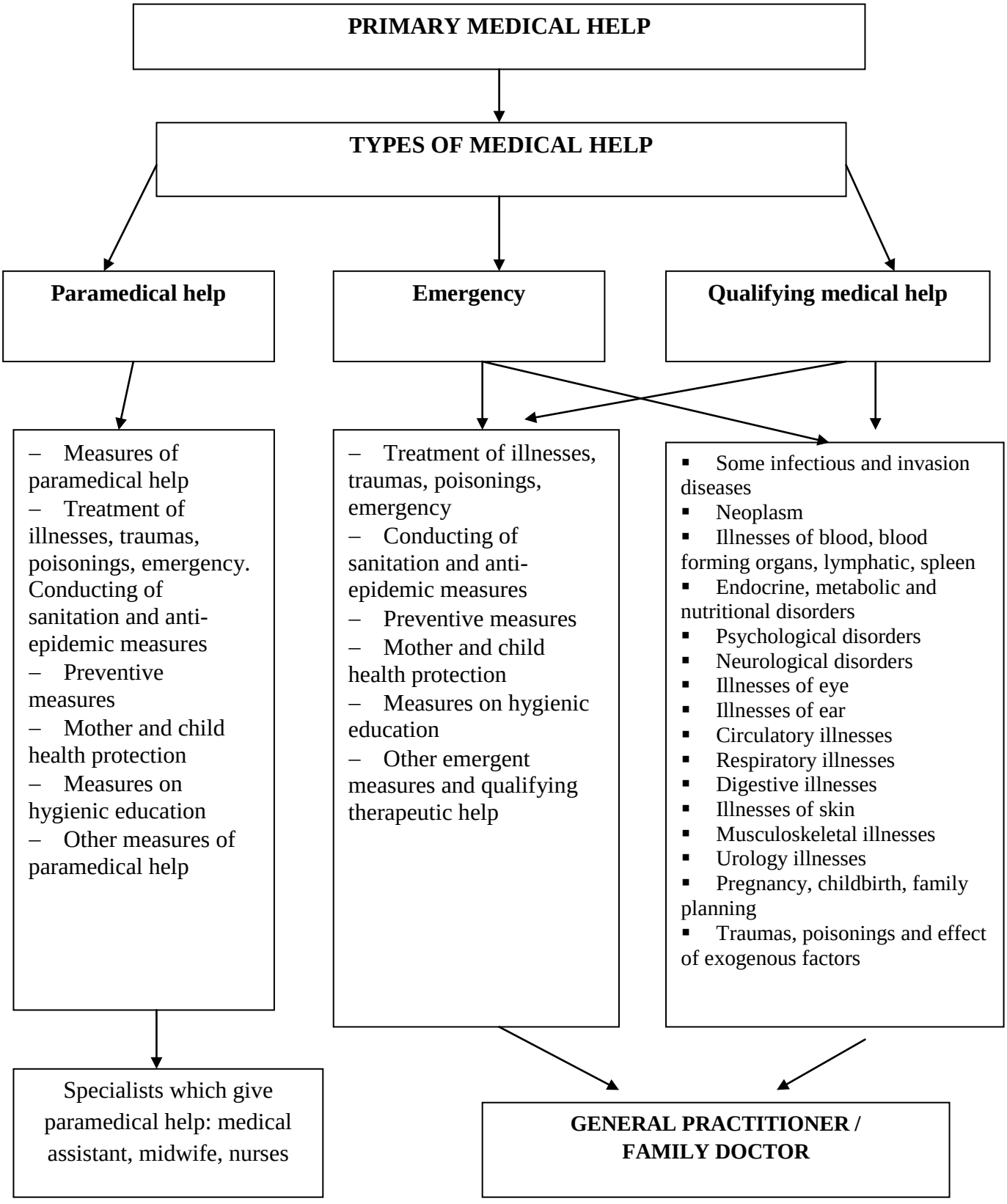
The FD should be able to act on behalf of the patient to collaborate with other specialists, coordinate the care given by the hospitals or rehabilitation clinics or other health institutions, to keep track of all of the patient's records, provide long-term management of chronic conditions.

Continuous care is especially important for patients with polymorbid pathology, which involves many organs and organ systems, for those who require long-term treatment and supervision [2].

Therefore actually, in the conditions of reformation of the system of the medical provision and health protection in Ukraine in direction of priority development of primary medical help on principles of family medicine, studies of students of organization of activity of family doctor acquires a large value.

Algorithms and tables according theme

Kind and volume of medical care, which is given by a general practitioner/ family doctor



The organization of primary health care for rural population

District center

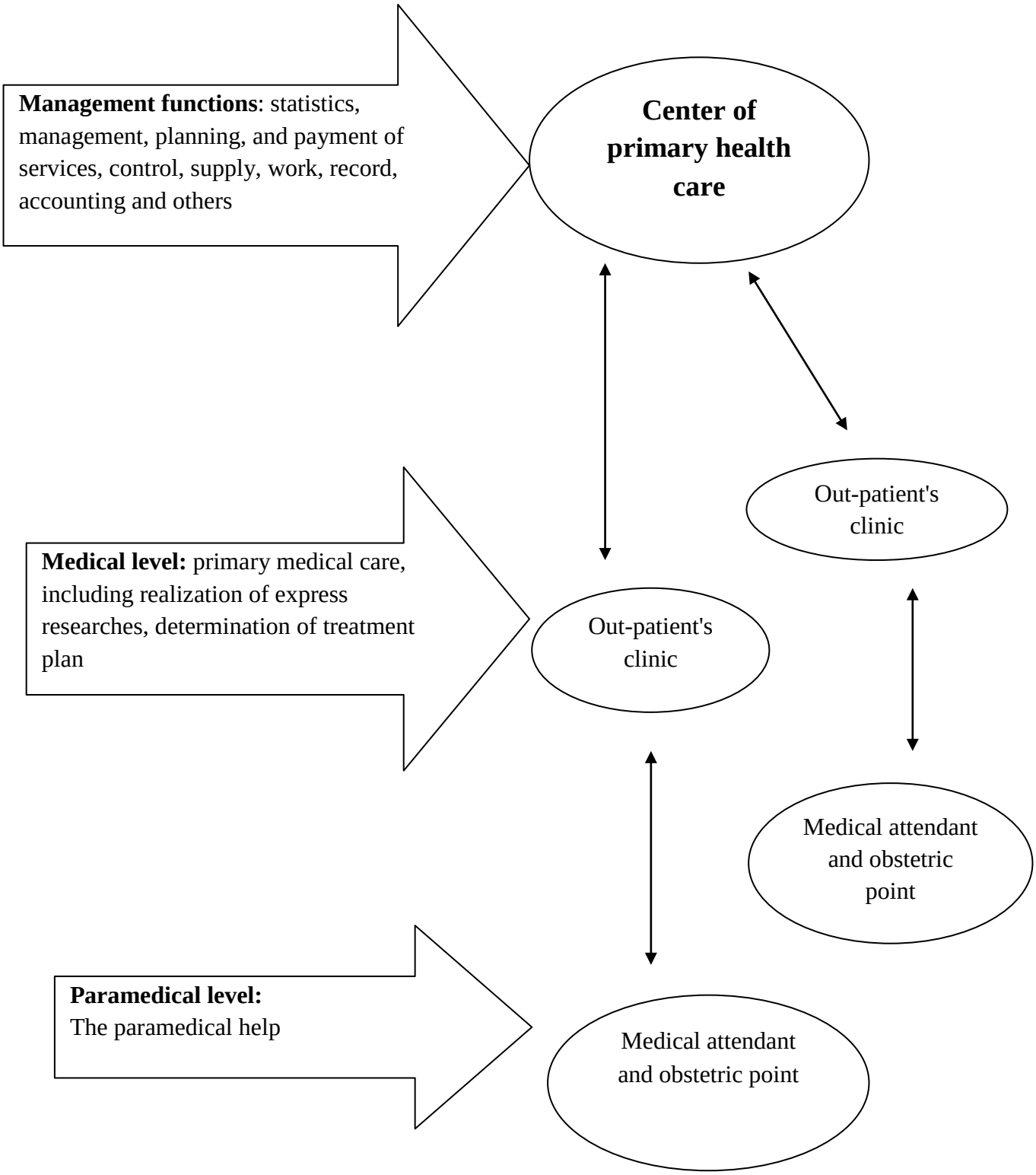
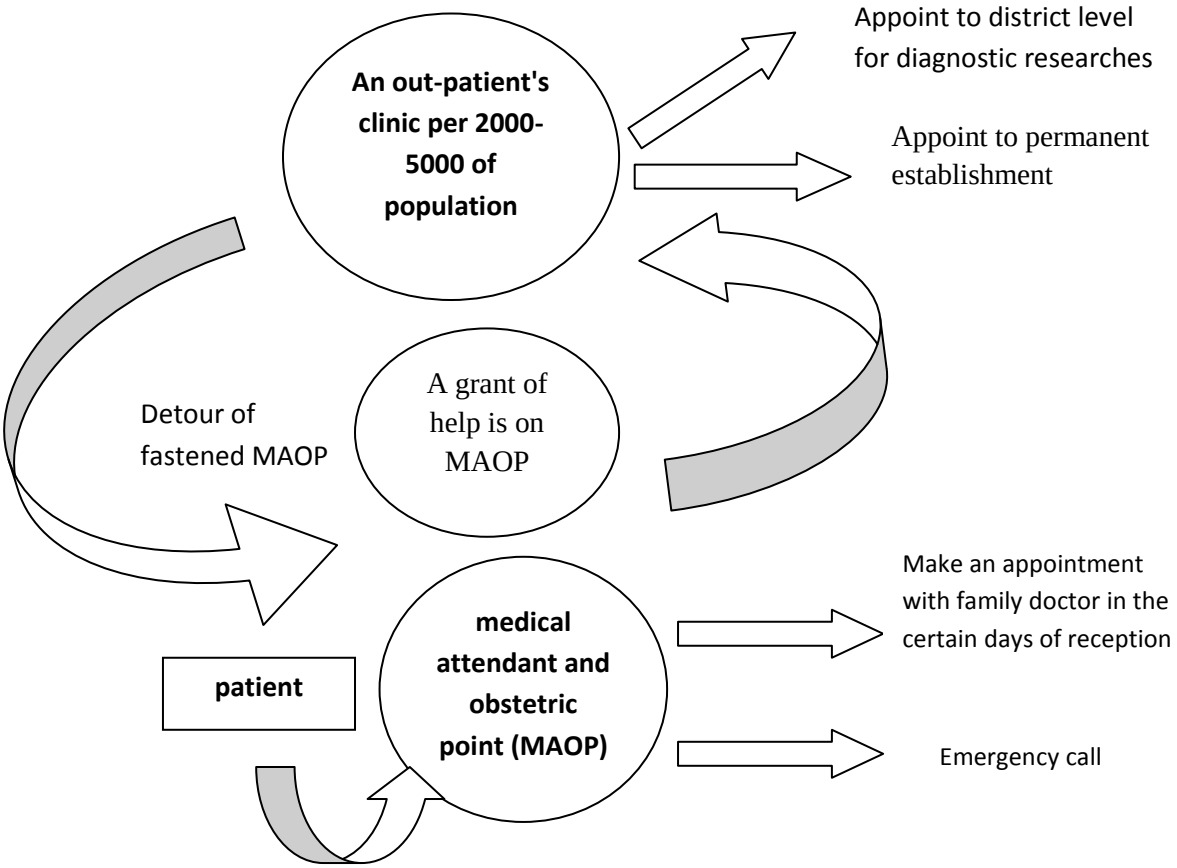
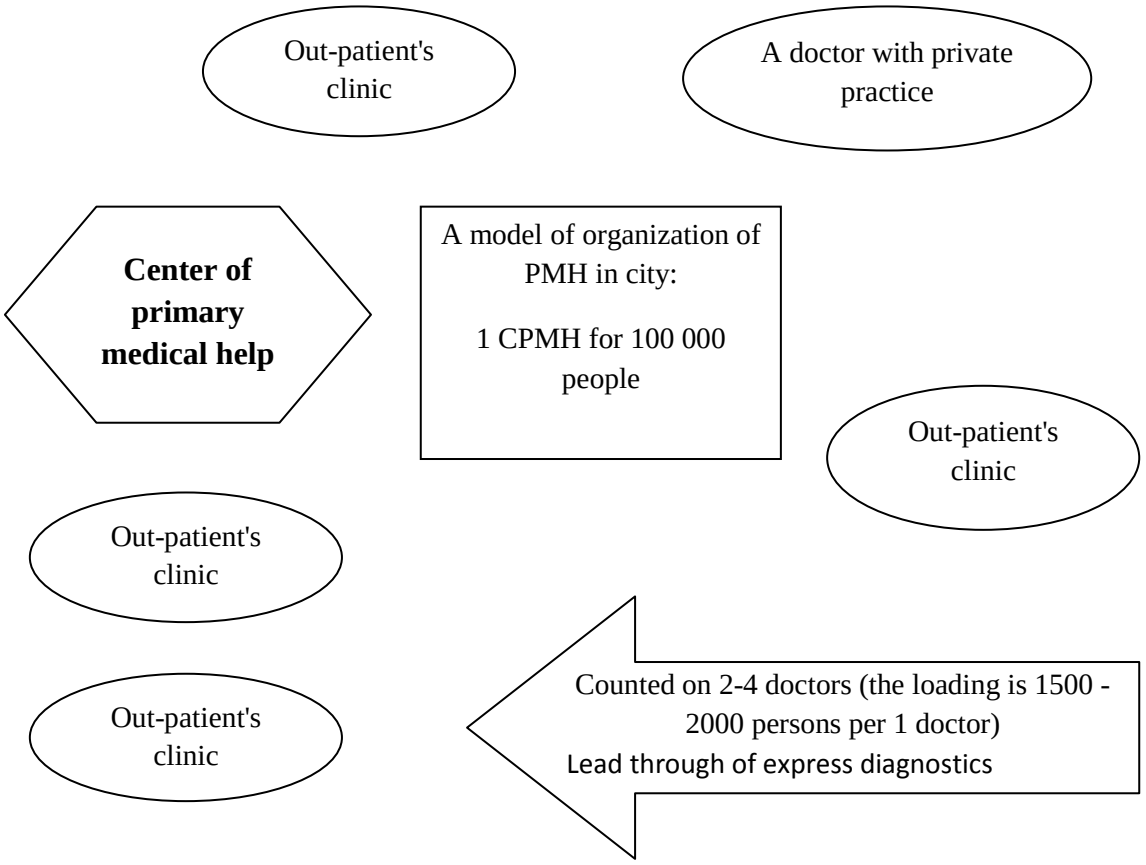


Chart of work with a patient at primary level of medical care in rural area



Organization of urban primary medical help (PMSH)



Registration forms and documents of family doctor

The registration form	Number of registration form
History of development of child	F. 112/o
Individual card of pregnant	F. 111/o
Check-card of clinical supervision	F. 030/o
Check-card of clinical supervision after the risk group persons for development of occupational disease	F. 030-3/o
A card of appeal for antirabies help	F. 045/o
Card of vaccination	F. 063/o
Case history in day hospital and hospital at home	F. 003-2/o
The sheet № 1 to F. 025/oh (preventive examination)	-
The sheet № 2 to F 025/oh (annual epicrisis)	-

Communication registration forms

The registration form	Number of registration forms
The appointment card to blood and urine examination	F. 200-207/o
The appointment card to doctor-specialist and other examinations (in diagnostic rooms, laboratories)	
The card for sanatorium-and-spa treatment	F. 072/o
The children card for sanatorium-and-spa treatment	F. 076/o
A child's sanatorium voucher	F. 077/o
A medical certificate for student in health camp	F. 079/o
Appointment card for medico-social commission of expert	F. 088/o
Appointment card for obligatory preventive examination of worker	F. 093/o
Case record	F. 027/o

List of registration forms which are get to the patient

Name of registration form	Number of registration forms
A certificate is for the receipt of tour	F. 070/o
Doctor advisory opinion	F. 086/o
A medical certificate about temporary disability (sick leaf)	F. 095/o
Certificate about the term of temporary disability for insurance company	F. 094-1/o
The prescription	

The record books of general practitioner/family doctor in out-patient's clinic

Name of registration form	Number of registration forms
Family book of district	F. 025-8-1/o
Book of record of maternity help at home	F. 032/o
Book of record of medical certificate	F. 036/o
Book of record of hygienic education among population	F. 038/o
Book of record of visits in out-patient's clinics, dispensary, at home	F. 039/o
Book of record of outpatient surgery	F. 069/o
Book of record of the death	F. 151/o
Book of record of new-born	F. 152/o
Book of record of emergency case	F. 155-1/o
Book of record of infectious diseases	F. 060/o
Book of record of vaccinations	F. 064/o

List of statistical accounting forms

The list of record of morbidity and death reasons in medical establishment (among children up to 14 years old inclusive)	F. 071/o	quarterly report
The list of record of morbidity and death reasons in medical establishment (among an adult population up to18 years old)	F. 071-1/o	quarterly report
The list of record of the new cases of traumas and poisonings in medical establishment	F. 071-2/o	quarterly report
A report about morbidity among district population	12	annual report

TESTS FOR FINAL CONTROL

1. What are the main medical care services which can be provided by the Family physicians?

A. routine check-ups

B. health-risk assessments

C. immunization and screening tests

D. personalized talk with a patient about managing of a healthy lifestyle

E. all of mentioned above

2. Primary care involves the wide range of the patients groups, which include the following ones:

A. Patients of all ages

B. patients of different geographic origins and level of material well-being

C. patients who seek prevention

D. patients with different acute and chronic diseases, which include physical, mental,social or other health issues

E. all of mentioned above

3. The primary health care covers the basic medical care, simple diagnostics and treatment, referral to the higher level in difficult cases, preventive measures and the principal community health activities:

A. basic medical care in the case of acute and chronic diseases

B. simple diagnostics and treatment of chronic non-communicable diseases

C. referral to the secondary and tertiary levels in difficult cases

D. preventive measures and the principal community health activities

E. all of mentioned above

4. What are the basic medical skills, which should be performed by the FDs?

A. interpreting results electrocardiograms, endoscopy

B. interpreting results of blood, electrocardiograms, or X-Rays

C. perform X-Ray

D. perform endoscopy

E. perform US or endoscopy

5. The FD acts on behalf of the patient to collaborate with:

A. referral specialists

B. coordinate the care given by the hospitals, rehabilitation clinics or other healthcare institutions

C. act as a comprehensive repository for the patient's records

D. to provide long-term management and/or palliative care in case of chronic diseases

E. all of mentioned above

6. In addition to diagnosing and treating illness, FD providespreventive care, including:

A. routine check-ups

B. health-risk assessments

C. immunization and screening test

D. personalized counseling on maintaining a healthy lifestyle

E. All of mentioned above

7. Social meaningfulness of major non-epidemic diseases is conditioned by:

A. high prevalence;

B. considerable disability;

C. high disability;

D. high death rate.

E. all of mentioned above

8. Family doctor acts on behalf of the patient in order to help in the following situations:

A. To coordinate the care given by the different healthcare institutions such as hospitals

B. coordinate the care given by varied organizations such as rehabilitation clinics

C. act as a comprehensive repository for the patient's records

D. to provide long-term management and/or palliative care in case of chronic diseases

E. all of mentioned above

9. FD is usually the first medical practitioner contacted by a patient, due to factors such as:

A. ease of communication

B. accessible location

C. familiarity

D. prices for the medical services and changes to the care requirements

E. all of mentioned above

10. Which medical conditions require continuous care for the patients?

A. medical conditions that envolve polymorbid pathology

B. diabetes mellitus and hypertension

C. medical conditions that envolve polymorbid pathology and require long-term treatment and/ or supervision by the doctor

D.diabetes mellitus and asthma

E.COPD and asthma

Answers:

1	2	3	4	5	6	7	8	9	10
E	**E**	**E**	**B**	**E**	**E**	**E**	**E**	**E**	**C**

Practical tasks

1. Expect the dynamics of visit of family doctor, if the annual number of visits in this year is 5750, and previous year was 5945.

2. Expect the family doctor loading, if district doctor loading is 1700 persons (percentage of adults is 75%), district pediatrician loading is 800 patients (percentage of children is 25%).

3. Expect the family doctor loading, if district population include 28 children till 3 years old, 14 invalids of the I and II groups; 24 persons older than 70 years, 76 children of preschool age.

4. Calculate frequency of exposure of disease, if 1342 persons were examined, and 5 cases were diagnosed.

5. Design of situation: appoint the patient to necessary instrumental examination in the range his cost and according to territorial remoteness.

TOPIC 2
THE PRINCIPLES AND TYPES OF MEDICAL INSURANCE, THE ACTIVITY OF FD.THE CONCEPTION AND FEATURES OF PALLIATIVE CARE. THE PRINCIPLES AND METHODS OF PALLIATIVE CARE.THE PALLIATIVE CARE IN OUT-PATIENT SETTINGS. THE CARE OF PATIENTS WITH UNCURABLE DISEASES IN THE PRACTICE OF FD, CO-WORK WITH SPETIALISTS

I. Theme actuality

Medical insurance is a form of social security in the sphere of health protection which purpose for the population is to ensure receipt of payment on account of accumulated funds and to raise finance for prophylaxis in case of insured accident. Medical insurance is realized in two ways: mandatory and voluntary. Mandatory insurance is a constituent part of state social insurance and it secures equal opportunities for all citizens in medical aid which is given by means of mandatory medical assurance funds. Voluntary medical insurance is realized on the basis of correspondent state programs and secures medical and some other services for the citizens. These services are determined by programs of mandatory medical insurance. Voluntary insurance can be group and individual [5].

Palliative care is a multidisciplinary approach used for the specialized medical and nursing care for people, who have life-limiting illnesses. It focuses on the people with the terminal diagnosis, especially on providing them with relief from the symptoms, pain, physical and emotional stress because of their condition The main goal fo the family doctor in case of providing the palliative care is to improve quality of life for the patient and also his family [2].

Palliative care is not only performed by the provided by primary care physician –it also includes referred specialists and other health professionals such as team physicians, nurses, physiotherapists, occupational therapists and and other hospital or hospice staff who work together in order to provide additional support. Palliative care can be provided as the main goal of care, it is appropriate to use it at any age and at any stage in a serious illness and or along with curative treatment. Although it is usually referred to as a end-of-life care, it is not limited to that stage. It can be provided in hospitals, at home or as part of community palliative care programs, also even by the skilled nursing facilities. Palliative care teams provide

symptom management, psycho-social, and spiritual support, work with people and their families at the same time [2].

II. Study purposes: to outline the basic rules and economical aspects of insurance medicine, principles of palliative care.

III. Concrete purposes of the module:

- to be aware of the conception of health, medical condition, illness, functional clinical syndromes;
- to be able to analyze the health, to fill medical passport of health;
- to know the main principles of the health improving and functional clinical syndromes;
- to perform the clinical examination of ill and healthy;
- to know the principles of the rehabilitation and resort treatment;
- the structure of health insurance.
- to know the of medical insurance. The structure of insurance policy.
- To be aware of the economical aspects of insurance medicine. The source of financing.
- To know the rights of the patient for doctor choosing. The organization of work of doctor in municipal and private medical settings.
- To be aware of the problems of insurance medicine in Ukraine.
- to be able to analyze the quality control of different types of insurance.
- To know the principles of palliative care of patients with terminal stages of diseases.
- To know the definition of pain syndrome, the acute and chronic pain, intensity of pain.
- To perform the differential diagnosis of somatic pain and psychosomatic disorder. The treatment of pain syndrome in different clinical situations. The “pain ladder” according WHO.

IV. A student must be able to collect prior medical history, examine the patient, to appoint and use the medicinal and non-medicinal methods of treatment for the patients with terminal stages of diseases, with pain syndrome, carry out the clinical supervision under patients and fill medical documentation.

V. Task for initial independent training

1. The primary prophylaxis of diseases includes:

A. Prevent further development of illness and its complications.

B. Prevent development of diseases and influence of risk factors.

C. Optimization of life style.

D. Improvement of socio-economic conditions.

E. Medical help to the patients in the case of acute illnesses.

2. The concept "health" is:

A. The state of organism, which permits to execute the biological and social functions

B. The state of organism, when all his functions are balanced with an environment

C. absence of diseases and physical defects and the state of full physical, spiritual and social well-being.

D. complex of demographic indices, such as morbidity, physical development, disability and frequency to the nosological states

E. Interval within the limits of what oscillation of biological processes is retained organism at the level of functional optimum

3. Types of prophylactic reviews which are carried out in medical and preventive establishments:

A. Periodic, having a special purpose;

B. Medical, quarterly;

C. Annual, ambulatory;

D. Previous, periodic, meetind a special goal;

E. monthly, quarterly, annual.

4. Healthy life style is a behavior of people which includes the following:

A. health maintenance;

B. good physical condition of the organism;

C. Active longevity;

D. Good nutritional status;

E. All of above mentioned.

5. Palliative care is a:

A. Regular medical check-up
B. In-hospital care
C. multidisciplinary approach used for the specialized medical and nursing care for people, who have life-limiting illnesses
D. Home hospital
E. Out-patient care

6. What is the definition for the egal entity or individual,who that pays financial subscription (insurance) and legally have a right to obtain sum of money in case of insured accident?

A. Insured
B. Insurer
C. Insured person
D. Insurance agent
E. Insurance broker

7. What is the definition for organization (legal entity) that assumes a liability to indemnify and questions concearning creating and spending of insurance fund and realizes insurance?

A. Insured
B. Insurer
C. Insured person
D. Insurance agent
E. Insurance broker

8. What is the definition for individual whose health, life and efficiency is the object of insurance security?

A. Insured
B. Insurer
C. Insured person
D. Insurance agent
E. Insurance broker

9. What is the definition for individual who is a part-time servant and makes an insurance treaty in the name of insurer for the commission compensation?

A. Insured
B. Insurer
C. Insured person
D. Insurance agent
E. Insurance broker

10. Insurer's fee for the insurance contract is called:

A. Insurance premium
B. Sum insured (insurance money)
C. Underwriting rate
D. Deductible
E. All the above mentioned

Answers:

1	2	3	4	5	6	7	8	9	10
B	**C**	**D**	**D**	**C**	**A**	**B**	**C**	**D**	**A**

VI. Basic questions after a theme

- The rules of medical insurance. The structure of insurance policy.
- The economical aspects of insurance medicine. The source of financing.
- The rights of the patient for doctor choosing. The organization of work of doctor in municipal and private medical settings.
- The problems of insurance medicine in Ukraine.
- The quality control of different types of insurance.
- The principles of palliative care of patients with terminal stages of diseases.
- The pain syndrome, the acute and chronic pain, intensity of pain.
- Differential diagnosis of somatic pain and psychosomatic disorder. The treatment of pain syndrome in different clinical situations. The "pain ladder" according WHO.

VII. Practical skills

Practical class is in out-patient's clinic; students together with family doctors perform the physical examination of patients with pain syndrome, carry out the clinical supervision under patients and fill medical documentation, and prescribe the individualized treatment.

1. To fill the medical passport of family.

IX. The content of theme

The health care expenditures in the different countries rose at a rate of more than 10% per year, which exceeded the rates of inflation and of growth in the gross national product [5].The reasons for the increase in health care costs are multifactorial:

- the aging of the population;
- the availability of new diagnostic and therapeutic advances;
- the supply of specialists has increased dramatically, providing people with easier access to advanced medical services but also suggesting than an oversupply of physicians contributed to an excessive escalation in costs;
-by decisions regarding hospital admission and surgery and by decisions affecting the use of intensive care units, life-sustaining treatments, and long-term care facilities. Efforts at cost-containment have attempted to identify unnecessary services, such as routine preoperative electrocardiograms in healthy young patients, or situations in which extraordinary expenses occur, such as in the last 6 months of life.

Despite these rising costs an share of the population do not have health care insurance of any kind, even though nearly half are in households in which someone is employed [2,5].

The aim of the tertiary prevention is to reduce the damage caused by symptomatic disease by means of focusing on mental, physical, and social rehabilitation. The main objective of tertiary prevention is to help to an already disabled patient to maximize the remaining capabilities and functions.

Health insurance. Traditional fee-for-service insurance reimburses the hospital and the physician for services rendered but frequently does not cover preventive care. Even when insurance provides coverage for a service, the patient

may be responsible for an initial "deductible" and a copayment, which is usually a fixed percentage of the entire amount charged.

Patients who must pay such out-of-pocket charges for some of their medical care seek less care than those whose care is fully covered by insurance. In the working poor this may result in reduced utilization of services and in an increase in the prevalence of serious disease. When adults of all socioeconomic classes lose health insurance coverage, they may use fewer medical services; as a result, their health status tends to decline [2].

Most alternatives to traditional fee-for-service medical care require enrolled persons to prepay a fixed premium, which, except when a relatively small copayment is required, usually covers acute, chronic, and preventive medical services and sometimes covers medications and other health care needs. Prepaid plans have varying organizational and financial structures. Early on in their development, staff-model health maintenance organizations (HMOs) were among the most popular formats. In this model, groups of salaried physicians practiced physically together in one or a few central facilities to provide prepaid care. In recent years, independent practice associations (IPAs) have shown the most rapid growth. IPAs provide prepaid care to the patient by contracting with office-based practitioners who agree to see patients on a prenegotiated fee schedule or for a fixed monthly per-patient capitated payment. To balance the normal fee-for-service incentives and control utilization, IPAs employ various forms of administrative controls and review. The number of days of hospitalization has been markedly reduced among enrollees in HMOs, and HMOs have been among the leaders in attempts to reduce hospital costs and lengths of stay[5].

Reimbursement of hospitals and physicians. In 1983, Medicare introduced a system of prospective reimbursement using diagnosis-related groups (DRGs), whereby hospitals were paid a predetermined sum based on the patient's principal diagnosis, procedures, complications, and comorbidities regardless of the costs or charges that were actually generated by the hospital stay. This reimbursement system was designed to reward hospitals for being more efficient, and hospitals could actually be paid more than their costs. While the prospective reimbursement system has undoubtedly stimulated efficiency, it also has raised concerns about the practice of discharging patients prematurely or transferring

them to other institutions if the projected cost of caring for them exceeds the expected reimbursement [2].

Since the introduction of federal prospective reimbursement, the number of inpatient hospital days has decreased. This reduction has been accompanied by a marked increase in ambulatory services, including a shift to the outpatient arena of services that previously were delivered only on an inpatient basis. This shift should lower the cost of delivering an individual unit of service, such as the cost of a breast biopsy, but the overall cost of medical care will rise if, for example, the breast biopsy is performed on an ambulatory basis and the inpatient resources that the breast biopsy patient would have used are now consumed by new services such as the treatment of a breast cancer patient with bone marrow transplantation.

Methods of physician payment also have been revised. Physician reimbursement in the U.S., whether by Medicare or by private insurers, traditionally was a direct payment based on the doctor's "usual and customary" fee. Medicare changed this approach when it adopted the relative value scale, which is based on the concept that payment rates for medical services should, as with other economic "goods," reflect the costs of producing those services. This change suggests that procedural tasks were being reimbursed at rates exceeding those of nonprocedural tasks that require comparable time, skill, and experience[2,5].

Two different approaches have been suggested to **control health care costs**:

- regulations, such as per diem rate setting, attempt to control costs by setting and enforcing practice or reimbursement standards. Other regulatory means of attempting to reduce costs include mandatory second opinions prior to elective hospitalization or surgery, but such programs usually do not save more than the costs of administration of the programs themselves;
- competition- the competitive approach encourages hospitals and providers to bid in a free-market atmosphere, in which consumers will presumably make rational choices based on the perceived cost and quality of the available alternatives. Insurance plans that utilize deductibles and copayments reflect this approach. It also has been proposed that physicians who practice inexpensively should be rewarded financially, but if physicians are paid to perform fewer services, the quality of care may suffer. In the absence of legislative reform, the U.S. health care system has been changing rapidly in response to competitive forces. In some parts of the country, employers have joined together to demand lower insurance

premiums or to contract directly with hospitals and physicians. In other areas, hospitals, doctors, or doctors with their hospitals have contracted with insurance carriers to establish comprehensive systems that can deliver the full range of health services to a large population of individuals. For-profit insurers and hospitals often compete actively with more traditional not-for-profit entities [5].

Palliative care faces the problems associated with life-threatening illness and helps to improve the quality of life of patients and their families, by the means of the prevention and relief of suffering using the early identification, assessment and treatment of pain and other physical, psychosocial and spiritual problems.

Palliative care helps to relief the pain and other unpleasant symptoms; asserts life and considers dying as a normal process; does not intend to accelerate or postpone death; combines the psychological and spiritual aspects of patient care; offers a support system to help patients to have an active life as long as it’s possible to death; provides help to the family in order to cope during the illness of patients and in their own severe bereavement; uses a group approach to meet the needs of patients and their families, including counseling about the loss, if indicated; will improve the quality of life and can also positively affect the course of the disease; is used at an early stage of the disease in combination with other therapies that are intended to prolong life, such as chemotherapy or radiation therapy, and include those studies that are necessary to better understand and manage severe clinical complications. [2]

Palliative Care for Children according to the WHO Definition

Palliative care for children is a special field closely related to adult palliative care. WHO’s The definition of palliative care appropriate for children and their families apply to other paediatric chronic disorders and was stated by the WHO in 1998. It includes the following:

- it is the active complex care of the child's body, mind and spirit, and also the support to the family.
- It starts when illness is diagnosed, and continues regardless of the received treatment directed at the disease.
- Health care specialist should evaluate and control a child's physical, psychological, and social distress.
- Effective palliative care includes the family and makes use of available community resources: it requires a broad multidisciplinary approach;

- It is possible to provide palliative care tertiary care facilities, in community health centres and even in children's homes [5].

Palliative care should not be delayed when it is indicated, because it helps to decrease the pain level, to control the symptoms, and decrease the stress for the patient and family. Evidence shows that end-of-life communication interventions (particularly in the intensive care unit setting) help to decrease utilization (such as length of stay), and are effective for improving patient and caregiver perceptions of care (especially in the outpatient setting).

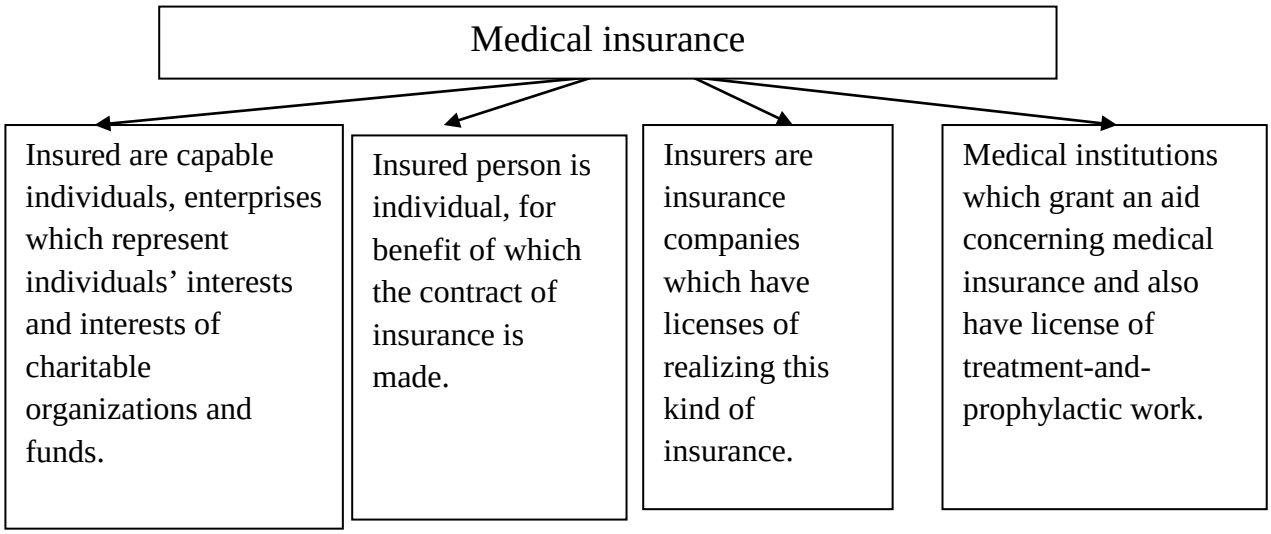
Palliative care created for the quality of life improvement, for the decrease of depressive symptoms, and increase of the survival time. Palliative care should begin in the emergency department immediately if it is indicated for a person Often the discussion about palliative care and hospice services is opened by the emergency care physicians, because often they are the first medical professionals to communicate with people needing care and their families.

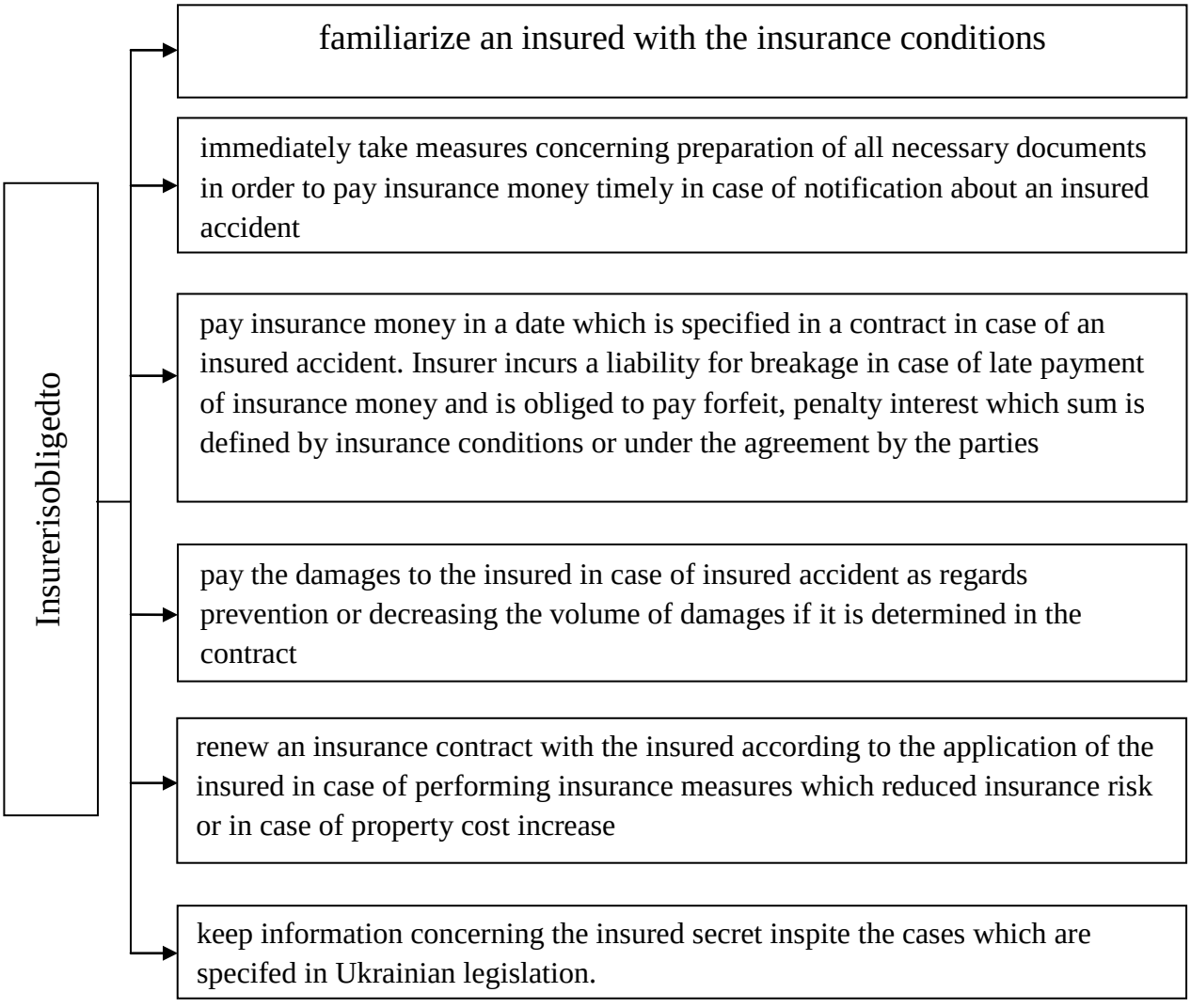
In some cases, it is recommended by medical specialty professional organizations that sick people and physicians may respond to an illness only with palliative care and not with a therapy directed at the disease.

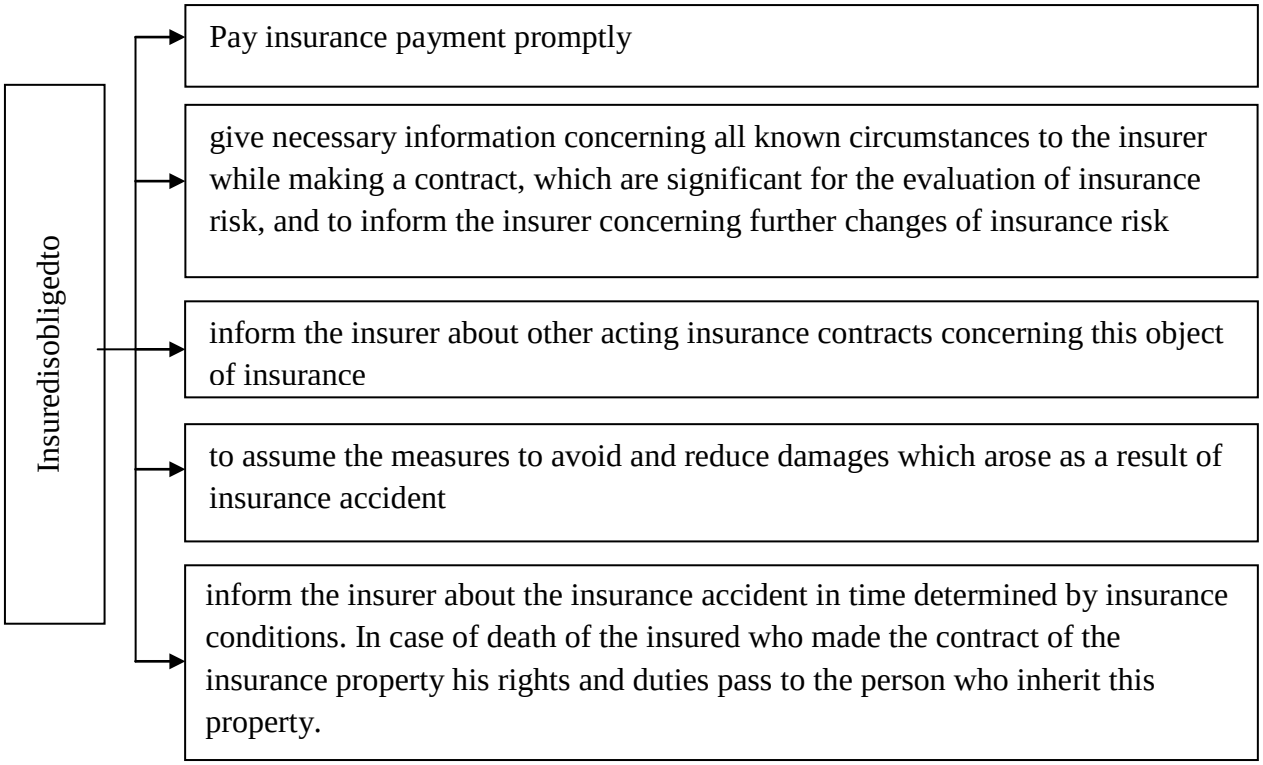
A person who should receive palliative care but not any cancer-directed therapy should meet the following items:

1. people with a limited ability to care for themselves
2. people who received evidence-based treatments with no benefit
3. people who are ineligible to participate in any appropriate clinical trial
4. the physician sees no strong evidence of the effectiveness of the treatment [2,5].

ALGORITHMS AND TABLES ACCORDING THEME







Comparative features	Social insurance	Commercial insurance
Legal base	Mandatory	Voluntary
Scope	Mass	Group with relatively narrow coverage of population and individual
Indemnification conditions	Secured mechanism and unique set of social payments and benefits	Various "suits" of compensations and services which forms at opinion of each insurer
Status of administrator of insurance facilities	Public or quasipublic organization	Private insurance companies
Principles of indemnification organization	Current financing collective goods for others	Accumulated financing of special benefits for the insured performed by legal entity or individual
Efficiency criteria	Funds rearrangement has characteristics of social transfers, i.e. depend on goal efficiency (including generality of scope).	Rearrangement is limited by group limits and is subjected to cost-based efficiency of the insurer and insured.

TESTS FOR FINAL CONTROL

1. Chronic pain syndrome is characterized by the ongoing pain that lasts for more than:

A. 6 months

B. 3 months.

C. 1 months.

D. 8 weeks.

E. 6 weeks.

2. Which effects of the chronic pain syndrome in the patient's life are leading?

A. depression, anxiety.

B. reduced physical and sexual activity.

C. bad habits

D. disability out of proportion with impairment.

E. All of the above mentioned.

3. Chronic pain may is the cause of the following changes in patient's life:

A. long-lasting physical suffering

B. loss of job

C. personal problems

D. adverse medical reactions to treatment

E. All of the above mentioned.

4. What medications may be used as a pharmacotherapy of chronic pain syndrome to reduce morbidity and prevent complications:

A. nonsteroidal anti-inflammatory drugs, Muscle relaxants, Antidepressants

B. corticosteroids, Muscle relaxants

C. nonsteroidal anti-inflammatory drugs, Corticosteroids.

D. nonsteroidal anti-inflammatory drugs, physical therapy

E. all of mentioned above.

5. Which disorders can be the cause of chronic pain or contribute to it?

A. different psychiatric disorders

B. surgical pathology

C. different neuromuscular, reproductive, gastrointestinal (GI), and urologic diseases

D. neuromuscular diseases

E. neuromuscular and/or rheumatologic disorders

6. NSAIDs may increase risk of the following serious events:

A. increase of the stroke risk

B. increased risk of thrombotic events, myocardial infarction (MI), and stroke

C. increased risk of bleeding, ulceration, gastric or intestinal perforation

D. increased risk of gastric or intestinal perforation

E. all of the above mentioned

7. Pharmacotherapy of cervical spondylosis includes the use of the following medications:

A. corticosteroids, Muscle relaxants, injection

B. nonsteroidal anti-inflammatory drugs

C. nonsteroidal anti-inflammatory drugs, Corticosteroids, Muscle relaxants, Antidepressants

D. nonsteroidal anti-inflammatory drugs and Corticosteroids

E. physical therapy, nonsteroidal anti-inflammatory drugs

8. The myofascial pain definition is the following:

A. pain caused by the cervical nerves injuries

B. muscle pain

C. pain connected with the surrounding fascia of muscle

D. muscle and its surrounding fascia pain

E. pain caused by the cervical trauma

9. What is the ‘golden standart’ of the routine examination for every patient with suspected cervical spondylosis?

A. plain cervical radiography

B. computer tomography

C. MRI tomography

D. ultrasound examination

E. physical examination

10. A 12 week's pregnant woman came to the family doctor’s office. Her complains are the following: stabbing abdominal pain, intensive uterine bleeding. What should be the doctor’s tactics?

A. immediate hospitalization to the gynecological department;

B. call the other specialist (obstetrician – gynecologist);

C. immediate hospitalization to the maternity hospital;

D. immediate hospitalization to the surgical department;

E. apply the haemostatic drugs.

Answers:

1	2	3	4	5	6	7	8	9	10
B	**E**	**E**	**E**	**C**	**E**	**C**	**D**	**A**	**A**

TOPIC 3
MEDICO-SOCIAL ASPECTS OF THE POPULATION'S HEALTH. THE IMMUNOPROPHYLAXIS. THE PREVENTIVE ACTIVITY OF FD. SCREENING PROGRAM OF MEDICAL EXAMINATION. THE STRATIFICATION OF RISK, RISK FACTORS CONTROL FOR MAIN NON-EPIDEMIC DISEASES. THE PRINCIPLES OF REHABILITATION ACCORDING K. GUTENBRUNNER

I. Theme actuality

Preventive healthcare consists of measures for the prevention of the diseases. Disease and disability can be affected by the wide range of factors (environmental factors, genetic predisposition, disease agents, and lifestyle choices), in the same way as health encompasses a variety of physical and mental states. All of these three are dynamic processes and usually begin before individuals realize they are affected.

The definition of the risk factor refers as any attribute, characteristic or exposure of an individual that may increase the likelihood of a disease or injury occurance. Some examples of the more important risk factors are underweight, unsafe sex, high blood pressure, tobacco and alcohol consumption, and unsafe water, sanitation and hygiene.

At the top of preventable death statistics are the lifestyle factors (diet and exercise) and also the economics of healthy lifestyle which is a growing concern. Positive lifestyle choices can be regarded as an investment in health throughout life [1,2].

II. Study purposes: to master the methods of of the risk factors assessment of the main chronic non-epidemic diseases, to design the models of the preventive programs in case of cardiovascular, pulmonary, abdominal, urinary system, musculoskeletal system diseases.

III. Concrete purposes of the module:

- To know the risk factors of the main chronic non-epidemic diseases.
- To develop the preventive programs in case of cardiovascular, broncho-pulmonary, abdominal, urinary, musculoskeletal system and blood diseases.
- To be aware about the main principles of healthy nutrition.

- To know the 4 categories of a life-styles, the principles of “Health schools” organization.
- To perform the primary prevention of HIV infection.

IV. A student must be able:

- to define the definition of risk factors, their classification;
- to design the models of the preventive programs in case of cardiovascular, pulmonary, abdominal, urinary, musculoskeletal system and blood diseases;
- to master the main principles of healthy nutrition;
- to be aware of primary prevention of HIV infection.

V. Aims of initial level

A student must be able to find out risk factors of the main chronic non-epidemic diseases.

VI. Final objectives

Students must know the definitions of risk factors, their classification, be able to definethe models of the preventive programs in case of cardiovascular, pulmonary, abdominal, urinary, musculoskeletal systems and blood diseases, to know the main principles of healthy nutrition. Primary prevention of HIV infection.

VII. Task for initial independent training

1. The definition of primary prophylaxis includes:

A. Prevent further development of illness and its complications.

B. Prevent development of diseases and impact of risk factors.

C. Optimization of life style.

D. Improvement of material basis.

E. Medical help to the patients in the case of acute illnesses.

2. The concept "health" is:

A. The state of organism, which permits to execute the biological and social functions

B. The state of organism, in which all his functions are balanced with an environment

C. The state of full physical, spiritual and social well-being and absence of diseases and physical defects.

D. Conditional statistical concept, which includes the complex of demographic indices, morbidity, physical development, disability and frequency to the nosological states

E. Interval within the limits of what oscillation of biological processes is retained organism at the level of functional optimum

3. Types of prophylactic medical check-up which are carried out in medical setting:

A. Periodic, for special purpose;

B. Medical, quarterly;

C. Annual, ambulatory;

D. Previous, periodic, for special purpose;

E. Previous, medical, quarterly.

4. Healthy life style is a behavior of people which includes the following:

A. health maintenance;

B. good physical condition of the organism;

C. Active longevity;

D. Good nutritional status;

E. All of above mentioned.

5. Which alcohol consumption is appropriate for the patients with cardiovascular disease and shows the significantly lower incidence of cardiovascular and all-cause mortality?

A. 15-40 g/d

B. 20-30 g/d

C. 25-35g/d

D. 5-25 g/d

E. 10-15 g/d

6. What is the approximate initial goal of weight loss therapy?

A. 5% from baseline

B. 10% from baseline

C. 20% from baseline

D. 30% from baseline
E. if waist circumference is 35 inches in women and 40 inches in men

7. In post-MI patients when clinically indicated (eg, atrial fibrillation, left ventricular thrombus) is recommended as antiplatelet agents and anticoagulants:
A. Manage warfarin to international normalized ratio of 1,0-3,0 for paroxysmal or chronic atrial fibrillation or flutter
B. Use of clopidogrel 75 mg/d in combination with aspirin for up to 12 month
C. Use of clopidogrel 75 mg/d
D. Use of warfarin in conjunction with aspirin and/or clopidogrel
E. Use of higher-dose aspirin at 162-325 mg/d

8. Current rates of COPD are higher in:
A. men
B. women
C. no difference between sex
D. in men older than 50 years
E. in women older than 50 years

9. COPD occurs predominantly in individuals.
A. older than age 40 years
B. older than age 60 years
C. older than age 30 years
D. older than age 50 years
E. older than age 20 years

10. The patients with isolated systolic AH is attributed to the group:
A. Low risk of cardiovascular complications
B. the middle risk of cardiovascular complications
C. the high risk of cardiovascular complications
D. no risk of cardiovascular complications
E. neoplasm risk

Answers:

1	2	3	4	5	6	7	8	9	10
B	**C**	**D**	**D**	**D**	**B**	**A**	**A**	**A**	**C**

VIII. Basic questions after theme

- The notion “health”, “disease”. The functional clinical syndromes. The skill of assessment of health, the passport of health.
- The principle of health improvement. The popularization of healthy life style for prevention of chronic non-epidemic diseases.
- The patient education, quality of life.
- The implementation of screening methods in the practice of FD.
- The rick factors, their elimination and complications. The primary and secondary prevention. The smoking cessation.
- The prevention and prophylactic medical examination, in accordance with health, age, sex of individual, assessment of risk factors. The prophylactic medical examination: purpose, stages, groups, the criterion of effectiveness.
- The rehabilitation: types, principles, periods, principles of treatment (according K. Gutenbrunner). The resort treatment, the indication, medical documentation.
- The prevention of sexual transmitted diseases.
- The prevention of HIV, pre- and post-testing consultation.
- The new technologies of medical care on the basis of evidence-based medicine.

IX. Practical skills: practical class is in out-patient's clinic; students together with family doctors perform the examination of patients, estimate the risk factors, and prescribe the individualized preventive program.

1. To estimate the risk factors of the chronic non-epidemic diseases.

2. To design the preventive programs in case of cardiovascular, pulmonary, abdominal, urinary, musculoskeletal system and blood diseases.

3. To promote healthy life style.

XII. The content of theme

Risk Factors for chronic bronchitis, emphysema, and airways obstruction

- Both chronic bronchitis during life and extent of emphysema at postmortem are caused by the cigarette smoking. The prolonged cigarette smoking produces emphysematous changes, causes negative changes to ciliary movement, and function of alveolar macrophages, and also leads to hypertrophy and hyperplasia of mucus-secreting glands; it inhibits the activity of antiproteases and causes polymorphonuclear leukocytes to release proteolytic enzymes acutely. Inhaled

cigarette smoke causes an acute increase in airways resistance because of the vagally mediated smooth-muscle constriction, stimulated by the submucosal irritant receptors. [2]. Epidemiological studies confirm that active cigarette smoking is the most important risk factor for COPD. The risk of developing COPD with active smoking is 80%. Up to 90% of deaths associated with COPD are caused by active cigarette smoking, but only 15% of active smokers develop COPD due to smoking. In most cases, several risk factors are involved in the development of COPD, among which smoking plays a leading role. Only 10% of cases of COPD are associated exclusively with other risk factors, such as occupational hazards, genetic factors. Passive exposure to tobacco smoke causes such respiratory symptoms such as cough, wheeze, and sputum production. The main cause of COPD development as a result of smoking, both active and passive, is an increase in the rate (two to three times) of a natural fall in lung function, expressed in a decrease in FEV1, during life.

- Air pollution. According to Ukrainian and foreign studies, 17 to 63% of all respiratory diseases are caused by occupational and environmental factors.The most common pollutants of the environment are combustion products of diesel fuel, exhaust gases of trucks and cars (sulfur dioxide, nitrogen and carbon, lead, carbon monoxide, benzpyrene), industrial wastes - black soot, fumes, formaldehyde and others. Particles of soil dust (silicon, cadmium, asbestos, coal) also enter into the atmospheric air in the course of earthmoving and multicomponent dust. Unfavorable meteorological conditions (fog, precipitation, low and high air temperatures, decrease in wind speed) increase the toxic effect of aerosols on the respiratory tract. [1].
- Occupation. Chronic bronchitis is more prevalent in workers who engage in occupations exposing them to either inorganic or organic dusts or to noxious gases. COPD is formed in approximately 4,5-24,6% of persons working in harmful and unfavorable working conditions. The length of the work, the nature of the dust and its concentration in the breathing zone have a direct influence on the development of the disease and the stage of the pathological process. The professional experience for the appearance of the first symptoms of COPD is an average of 10 years.
- Infection. It is known that bronchopulmonary infections lead to respiratory dysfunction and may be a significant risk factor for COPD. In time earlier

pneumonia, acute bronchitis, frequent viral infection or bacterial infections of the upper respiratory pathway can cause COPD. There is evidence that some respiratory persistent infections in childhood lead to the development of COPD .

- Familial and genetic factors. Familial aggregation of chronic bronchitis has been well demonstrated. Children of smoking parents may experience more frequent and severe respiratory illnesses and have a higher prevalence of chronic respiratory symptoms. The nonsmokers who remain in the presence of cigarette smokers (passive smokers) have increased blood levels of carbon monoxide, which indicate that they are significantly exposed to smoke. Another well-documented form of indoor air pollution relates to the use of natural gas for cooking. The role of such pollution, however, remains controversial [1].

In the human genome, to date, several loci of mutated genes have been discovered, which are associated with the development of COPD. First of all, this deficit of alpha-1-antitrypsin - the basis of antiprotease activity of the body and the main inhibitor of neutrophil elastase.

The following genetic factors are involved in the development of COPD:

- Alpha-1-anti-chymotrypsin,
- Alpha-2-macroglobulin,
- Vitamin-D-binding protein,
- Cytochrome P 4501A1,
- Cystic fibrosis (CF transmembrane regulator).

- Alpha1-Antitrypsin Deficiency. The protease inhibitor α1-antitrypsin (αl-AT) is an acute-phase reactant, and normally the serum levels rise in association with many inflammatory reactions and with estrogen administration. Either deficient or absent serum levels of αlAT are found in some patients with the early onset of emphysema. By use of the techniques of acid starch gel and immunoelectrophoresis, genetic typing of the protease inhibitor types has been possible. The panacinar process predominates at the lung bases. Progressive dyspnea with minimal cough characterizes the clinical presentation, although chronic bronchitis is prominent in smokers [2].The precise way in which antitrypsin deficiency produces emphysema is unclear. In addition to inhibition of trypsin, αl-AT is an effective inhibitor of elastase and several other proteolytic enzymes. There is experimental evidence that the structural integrity of lung elastin depends on this antienzyme, which protects the lung from proteases released from

leukocytes. It is tempting to speculate that recurrent inflammatory reactions related to infection and pollutants play some role in pathogenesis by calling forth leukocytes whose released proteases are uninhibited and are free to cause the damage [1,2].The role of proteolytic enzymes in the induction of emphysema is not restricted to patients with αl-AT deficiency. Evidence is accumulating that proteolytic enzymes derived from neutrophilic leukocytes and alveolar macrophages can produce emphysema even in subjects with normal circulating levels of antiproteases. It is possible that local concentrations of proteolytic enzymes may exceed the inhibitory capacity of antiproteases that some proteases present are not susceptible to the available antiproteases, or that some of the proteolytic enzymes may be physically inaccessible to the antiprotease activity. The ultimate clinical utility of exogenously produced protease inhibitors currently under development will undoubtedly depend on which of the protease-antiprotease interactions predominates in the producion of emphysema. Reduction of endogenous elastase release from leukocytes in the lung has been achieved by colchicine (0,6 mg/d orally) in ex-smokers with chronic airways obstruction. Current smokers showed no such reductions.

Cardiovascular diseases (CVD) Prevention

Risk Factors for Atherosclerosis

Factor	Evidencefor Causality	Modifiable	Comment
Hypercholesterolemia Low HDL level	Strong Strong	Yes	Varies inversely with plasma triglyceride level
Hypertension	Strong	Yes	
Malegender	Strong	No	
Diabetesmellitus	Strong	Possibly	Effectiveness of stringent glycemic control uncertain
Family history of premature coronary artery disease	Strong	No	Premature onset before age 55 in first-degree relative
Highlipoprotein (a) level	Strong	Modestly	Skewed distribution(see text)
Cigarettesmoking	Good	Yes	
Post-menopausalstate	Good	Possibly	Estrogen replacement

			therapy being evaluated
Hyperfibrinogenemia	Good	Possibly	Fibric acid derivatives may reduce
Hyperhomocysteinemia	Good	Yes	Some patients respond to folate supplementation
Physicalinactivity	Good	Yes	
Obesity	Good	Yes	
Angiotensinconvertingenzymepolymorphism	Controversial	No	Homozygous deletion mutant associated with myocardial infractions

The lifestyle guidelines were intended for use by primary-care doctors as well as subspecialists. There are three major findings:

- Eat a dietary pattern that is rich in fruit, vegetables, whole grains, fish, low-fat dairy, lean poultry, nuts, legumes, and non-tropical vegetable oils consistent with a Mediterranean or DASH-type diet.
- Restrict consumption of saturated fats, trans-fats, sweets, sugar-sweetened beverages, and sodium.
- Engage in aerobic physical activity of moderate to vigorous intensity lasting 40 minutes per session three to four times per week [1,2].

The Mediterranean-style dietary patterns are a low-fat dietary pattern, although "low-fat dairy products" are part of the dietary pattern advice. There are no specific recommendations to reduce overall fat consumption, only to reduce the percent of calories consumed from saturated and trans-fats.

The general recommendation to "reduce sodium intake" is given a class IA by the ACC/AHA grading system. The mean daily sodium intake is about 3.5 g. Most of the sodium consumed is consumed as processed foods, so just focusing on a salt shaker on the table is not going to result in the reductions we want to see.

These lifestyle recommendations are intended for people with “prehypertension” or hypertension. Sodium reduction is an important element of successful blood-pressure lowering.

Risk Assessment and Primary Prevention. Risk Factors and Risk Scores.

Primary prevention reduces MI and heart failure, decreases the need for coronary revascularization procedures, and extends and improves the quality of life. On cardiovascular risk assessment in asymptomatic adults it's recommended obtaining global risk scores (eg, Framingham Risk Score) and a family history of cardiovascular disease for cardiovascular risk assessment [2].

The Framingham Heart Study first introduced the term risk factor into modern medical literature; the term is generally applied to a parameter that is predictive of a future cardiovascular event. Broadly, risk factors are arbitrarily divided into 3 major categories:

1. Nonmodifiable risk factors include: sex, age and hereditary predisposition along a closely related line (father, mother).

2. Modifiable risk factors include: smoking, atherogenic diet, alcohol intake, physical activity, dyslipidemias, hypertension, obesity, diabetes, metabolic syndrome

3. Emerging risk factors: C-reactive protein (CRP), fibrinogen, coronary artery calcification (CAC), homocysteine, lipoprotein(a), and small, dense LDL

Several risk scores have been developed to help predict an individual's risk of future cardiovascular events. For example, the Framingham Heart Study developed a coronary risk estimate using some of the following major traditional risk factors:

- Age
- Gender
- Family history of premature CHD (first-degree male relative < 55y, female < 65y)
- Elevated total or LDL cholesterol level
- Reduced HDL cholesterol level
- Smoking
- Hypertension
- Diabetes mellitus
- Obesity
- Sedentary lifestyle [1,2].

Using these risk factors, a Framingham score can be computed that helps assess the 10-year risk of CHD for individuals with risk factors. The childhood obesity is likely to lower the age of onset and increase the incidence of cardiovascular disease worldwide.

The differences in risk-factor burden result in marked differences in the lifetime risk for cardiovascular disease. They also conclude that these differences are consistently noted across both race and birth cohorts [1].In the following tables diabetes is excluded because it constitutes coronary artery disease risk equivalent.

Prevalence of coronary risk factors in the U.S. are as follows:

- LDL cholesterol >130 mg/dL – 46%;
- HDL cholesterol 40 mg/dL – 26%;
- Prehypertension – 22%;
- Hypertension – 25%;
- Tobacco use – 25%;
- Diabetes mellitus – 8%;
- Overweight or obese – 65%;
- Physically inactive – 38%;
- Metabolic syndrome – 24%.

Considerable clinical benefit can be derived from the management of 3 major modifiable coronary risk factors: hypercholesterolemia, hypertension, and cigarette smoking.

The addition of CAC scanning to conventional risk factor modification has been associated with superior coronary artery disease risk factor control without increasing downstream medical testing.

Every 1 mmol/L (38,7 mg/dL) decline in LDL cholesterol results in a 21% decrease in cardiovascular events. A decrease in systolic blood pressure by 10 mm Hg can decrease cardiovascular mortality by 20-40%. Similarly, the risk of acute MI increases by 5,6% for every additional cigarette smoked per day [1,2].

Assessment of pretest probability of obstructive coronary artery disease. The meaning of the pretest assessment is that if the probability of having a disease is very high (more than 85-90%), verification of the diagnosis by non-invasive methods does not make sense because of the high risk to get a false negative result. This is especially important when using techniques with low sensitivity. And vice versa, if the probability of the presence of the disease is very low (below 10-15%),

then the risk of obtaining a false positive result is high, especially when use of methods with low specificity. Thus, the choice of the method of non-invasive diagnosis should be carried out taking into account the sensitivity and specificity of specific techniques, as well as the probability of the presence of the disease. The pretest assessment of the probability of obstructive coronary artery disease is based on the characteristics of pain. Typical pain episodes are determined by three parameters: localization; provoking factor; the effect of taking nitroglycerin or from the cessation of the effect of the provoking factor. Then, according to the table, the probability of obstructive coronary heart disease [1].

Hypercholesterolemia/dyslipidemia. Screening should include a full fasting lipid profile including total cholesterol, HDL, and triglycerides measurements. The ratio of total or LDL cholesterol to HDL appears to be a powerful risk predictor. The lifestyle and drug management will initiate with the following goals.

- A primary goal of reducing LDL cholesterol level is as follows:

- < 100 mg/dL in individuals with CHD, diabetes, or >20% 10-year Framingham risk;

- < 130 mg/dL in individuals with 10-20% 10-year Framingham risk;

- < 160 mg/dL in individuals with < 10% 10-year Framingham risk.

- Secondary goals are as follows:

If LDL goals are achieved and triglyceride levels are >200 mg/dL, the goal for non-HDL cholesterol level should be set at 30 mg/dL higher than the LDL cholesterol level.

There is recommended lowering of the LDL target goals to < 70 mg/dL with at least 30-40% reduction for very high-risk individuals, such as those with ACS or diabetes and to < 100 mg/dL for those at moderately high risk.

Measurement of HDL cholesterol should be used as part of the initial cardiovascular risk assessment but should not be used as a predictive tool of residual vascular risk in patients who are treated with potent high-dose statin therapy to lower LDL cholesterol [1,2].

Prolonged LDL-lowering statin treatment produces larger absolute reductions in vascular events. The benefits of long-term continuation of statin treatment persisted for at least 5 years without any evidence of developing risks.

20 mg of rosuvastatin may possibly reduce major cardiovascular events in primary prevention patients with elevated high-sensitivity C-reactive protein who

have high global cardiovascular risk (10-year Framingham risk score >20%) when LDL cholesterol levels do not require pharmacologic treatment.

SCORE is a reliable screening tool for identifying individuals at increased risk of developing cardiovascular complications (risk ≥ 5% is considered elevated, ≥ 10% is very high). Data for assessing the impact of risk factors on the development of fatal and non-fatal cardiovascular events were first obtained during the Framingham study.

The category of very high risk includes patients :

- with CVD, documented by invasive or non-invasive studies, patients with coronary heart disease (CHD) and / or symptomatic atherosclerosis of peripheral arteries;
- with DM and with defeat of target organs;
- with chronic kidney disease (CKD) (glomerular filtration rate [GFR] <60 mL / min / 1.73 m2);
- with a 10-year risk of cardiovascular death by SCORE score> 10%.

The high-risk category includes persons with any of the following conditions:

- presence of at least one expressed risk factor (heart failure, severe AH);
- cardiovascular risk according to the SCORE score ≥ 5, but <10%.

The category of moderate risk includes patients:

- with SCORE risk ≥ 1, but <5%;
- this risk may be altered by the presence of other risk factors, such as family history, obesity, HDL cholesterol levels. triglycerides, C-reactive protein, lipoprotein (a).

A low risk category includes individuals with a cardiovascular risk rating on a SCORE scale <1%. It is proved that correction of the lipid spectrum with the help of appropriate levels of statin therapy primarily reduces cardiovascular risk, which in turn reduces the risk of death.

LDL-Cholesterol Goals and Cut Points for Therapeutic Lifestyle Changes and Drug Therapy in Different Risk Categories

RiskCategory	LDL Goal	LDL level at which to Initiate Therapeutic Lifestyle Changes	LDL level at which to Consider Drug Therapy
High risk - CHD or CHD risk equivalent (10-y risk >20%)*	< 100 mg/dL; optional goal < 70 mg/dL in very high risk**	≥100 mg/dL‖	≥100 mg/dL,¶ < 100 mg/dL consider drug options
Moderate-high risk - 2 or more risk factors (10-y risk 10-20%)†	< 130 mg/dL††	≥130 mg/dL	≥130 mg/dL; 100-129mg/dL consider drug options#
Moderate risk - 2 or more risk factors (10-year risk < 10%)	< 130 mg/dL	≥130 mg/dL	≥160 mg/dL
Lowerrisk - 0-1 riskfactor‡	< 160 mg/dL	≥160 mg/dL	≥190 mg/dL; 160-189 mg/dL consider drug options

* Heart disease risk equivalents include noncoronary forms of atherosclerotic disease (peripheral arterial disease, abdominal aortic aneurysm, and carotid artery disease) and diabetes. Ten-year risk defined by modified Framingham risk score.
† Risk factors that modify LDL goals include cigarette smoking; hypertension (BP ≥140/90 mm Hg or on antihypertensive medications); low HDL cholesterol (< 40 mg/dL); family history of premature CHD (CHD in male first-degree relative < 55 y or in female first-degree relative < 65 y); and age (men ≥45 y, women ≥55 y). HDL cholesterol ≥60 mg/dL counts as a negative risk factor; its presence removes 1 risk factor from the total count.
‡ Almost all people with 0-1 risk factor have a 10-year risk of less than 10%; thus, 10-year risk assessment in people with 0-1 risk factor is not necessary.
§ When LDL-lowering drug therapy is given, the intensity of therapy should be

sufficient to achieve at least a 30-40% reduction in LDL levels.
‖ Any individual at high or moderately high risk who has lifestyle-related risk factors (eg, obesity, physical inactivity, hypertriglyceridemia, low HDL cholesterol [< 40 mg/dL], or metabolic syndrome) is a candidate for therapeutic lifestyle changes to modify these risk factors independent of LDL level.
¶ If baseline LDL is < 100 mg/dL, institution of an LDL-lowering drug is an option. This can be combined with a fibrate or nicotinic acid if a high-risk person has a hypertriglyceridemia or low HDL (< 40 mg/dL).
# For moderately high-risk persons with LDL of 100-129 mg/dL at baseline or after lifestyle changes, initiation of an LDL-lowering drug to achieve an LDL of less than 100 mg/dL is an option.
** Very high risk favors the optional LDL goal of < 70 mg/dL and, in patients with high triglycerides, non-HDL cholesterol goal of < 100 mg/dL.
†† Optional LDL goal of < 100 mg/dL.

Triglycerides. Triglycerides are fats that provide the body with energy. The bulk of these fats are stored in body tissues, but some are in the blood. If the level of triglycerides in the blood exceeds the norm, they settle on the walls of the arteries and provoke diseases of the heart and blood vessels, primarily atherosclerosis.

A high level of triglycerides usually is not manifested by external symptoms. Assess the risk of developing atherosclerosis allows a test for the content of triglycerides in the blood or a lipid profile (lipid profile), which also determines the level of cholesterol of different types and the coefficient of atherogenicity.

Non-HDL cholesterol. Recently, non-HDL cholesterol (non-HDL-C) has become a commonly used marker for a blood lipid pattern associated with increased risk of heart disease. Non-HDL-C use in clinical practice is not a new concept. The Helsinki Heart Study3 used non-HDL-C levels to randomize patients. It is important to note that non-HDL-C (unlike LDL-C) represents the cholesterol content present in all the atherogenic lipoproteins . Therefore, treatment of non-HDL-C is grounded in a more holistic principle of dyslipidemia management than is LDL-C treatment. On this basis, non-HDL-C was added as a secondary treatment target in patients with elevated triglycerides (>200 mg/dL).1 The treatment goal for non-HDL-C is 30 mg/dL above the LDL-C treatment target. For

example, if the LDL-C treatment goal is <70 mg/dL, the non-HDL-C treatment target would be <100 mg/dL in a patient who has acute coronary syndrome (ACS) and a concomitant triglyceride level >200 mg/dL. Non-HDL-C has been shown to be a better marker of risk in both primary and secondary prevention studies.

When drug therapy is indicated for reducing LDL cholesterol, statins are generally initiated as first-line therapy. Exceptions include pregnancy, hepatic disease, or history of myositis while on these agents. Resins, nicotinic acid, or ezetimibe can be added if LDL cholesterol level is not reduced to goal. Pharmacologic therapy for triglyceridemia includes fibrates, nicotinic acid, and omega-3 fatty acids. Fibrates and nicotinic acid are also effective in raising low HDL, particularly when high triglycerides are present.

In mixed dyslipidemias, a statin may be combined with nicotinic acid or a fibrate. Non-HDL cholesterol is a useful parameter to monitor therapy results in mixed dyslipidemia. When using combined therapy, particularly statins plus fibrates, the risk of myositis increases and, therefore, patients should be educated about muscle symptoms. To minimize the risk of statin myopathy, the statin dose should be kept as low as possible to achieve the LDL goal, and it may be helpful to separate the dosing of statins and fibrates to evening and morning, respectively.

Varespladib methyl 500 mg once daily may be an effective antiatherosclerotic agent. Evacetrapib as monotherapy or in combination with statins increased HDL-C levels and decreased LDL-C levels [1].

Blood Pressure Control. Hypertension is a well-established risk factor for adverse cardiovascular outcomes, including CHD. Systolic blood pressure is at least as powerful a coronary risk factor as the diastolic blood pressure. Isolated systolic hypertension is now established as a major hazard for CHD. The reduction of diastolic blood pressure by 5-6 mm Hg results in a reduction of stroke risk by 42% and CHD events by 15%.

The self-management of hypertension, which includes self-monitoring of blood pressure and self-titration of antihypertensive drugs, along with telemonitoring of home blood pressure measurements, is an important new addition to the control of hypertension in primary care. Patients who self-manage hypertension have experienced a decrease in systolic blood pressure compared to those who sought usual care. Wireless remote monitoring with automatic clinician

alerts significantly reduced the time to a clinical decision in response to clinical events as well as reduced the length of hospital stay [1,2].

- In patients with mild hypertension (systolic 140-159 mm Hg or diastolic 90-99 mm Hg), the following is noted:

Despite side effects and cost of antihypertensive medications, the beneficial effects of treatment may outweigh the risks, even in low-risk patients;

Treatment is initiated with a low-dose of a once-a-day antihypertensive drug in an attempt to minimize future cardiovascular risk after a prolonged trial of nonpharmacologic therapy;

One such antihypertensive medication that is used worldwide is hydrochlorothiazide (HCTZ). A daily dose of 12.5-25 mg was measured using ambulatory blood pressure measurement and was shown to be consistently inferior to all other drug classes. HCTZ is an inappropriate first-line drug for the treatment of hypertension.

- In individuals with high-normal blood pressure (systolic 130-139 mm Hg and/or diastolic 85-89 mm Hg), the following is noted:

These persons have an increased risk of cardiovascular events over time compared with those who have optimal blood pressure;

Antihypertensive drug therapy should be considered among such patients if diabetes or end-organ damage is present.

Treatment, particularly with an angiotensin-converting enzyme (ACE) inhibitor or an angiotensin-II receptor blocker, is also warranted in patients with renal insufficiency, diabetes mellitus, or heart failure to slow the progression of the underlying disease [1,2].

Diet

Basic principles of nutrition in cardiovascular diseases:

1. Exclude foods that excite the nervous system from the diet. First, it's caffeine and caffeinated drinks: cocktails, energy drinks and even all sorts of colas. They increase the heart rate, further increase the loading of the heart muscle.

The same exciting products include strong tea, rich broths and dishes containing a large number of spices.

2. Reduce the intake of animal fat. Fat food of animal origin - canned meat, pork, fatty bird, all kinds of offal, sausage, smoked meat and lard - is rich in harmful cholesterol, which is deposited in blood vessels in the form of plaques.

But in the menu there is a place for low-fat veal, rabbit, chicken and turkey. Boil, cook for a couple or bake - any method of cooking that excludes the addition of extra fat is suitable.

3. Reduce the amount of salt in the diet. This will reduce the amount of fluid that is retained in the body and reduce the burden on the heart, forced to pump increased blood volume. Elevated blood pressure, in particular, develops, among other things, due to fluid retention.

Try to refuse pickles and marinades, do not buy ready-made sauces, smoked products and sausages. For the same reason, it is better to refuse fast food, snacks and semi-finished products, in which salt content is often increased.

4. Add Omega-3 fatty acids to the diet. These beneficial substances help to lower the level of cholesterol in the body, prevent the process of thrombosis and lower the pressure.

Most of all Omega-3 in vegetable oils and fish oil. Experts recommend choosing not too fatty fish and seafood. It is best to boil them, but you can fry without fat. But salted, smoked and canned fish for the heart is harmful - due to excess salt content.

5. Eat a fraction. 4-5 small meals during the day will be easily digested and will not create additional stress on the nervous, and, therefore, the cardiovascular system. [1].

The World Health Organization has published nutrition recommendations on the proven reduction in the risk of cardiovascular disease, many of which overlap with the traditional Mediterranean diet:

It is recommended to avoid the use of products with cholesterol, such as "red" animal meat, in favor of fish, seafood, chicken and pasta;

It is recommended to avoid products containing fatty acids that stimulate the generation of cholesterol by the human body itself, such as cream, butter, lard, in favor of olive or sunflower oil;

It is recommended to consume about 5 servings of fruits and vegetables a day, as well as dishes with maximum preservation of plant fibers, both whole and in the composition of salads;

Reduce the use of sweets in favor of fruit;

To consume at least 1 time a week dishes from fatty fish to consume from it an omega-3 acid that destroys cholesterol;

Do not use dishes with a lot of salt;

The diet is combined with an active lifestyle.

The Mediterranean diet had more favorable changes in weighted mean differences of body weight, body mass index, systolic blood pressure, diastolic blood pressure, fasting plasma glucose, total cholesterol, and high-sensitivity C-reactive protein than low-fat diets [2].

Dietary supplementation with marine ω-3 fatty acids (eicosapentaenoic acid, docosahexaenoic acid and the plant-derived α-linolenic acid) did not significantly reduce the rate of cardiovascular events among patients with a prior myocardial infarction.

Alcohol. Currently, there are epidemiological data that the likelihood of developing coronary artery disease in people who drink alcohol in moderate doses is lower than that of absolute nondrinkers. It is proved that the dependence between the amount of alcohol consumed and the mortality from ischemic heart disease is U or J-shaped, that is, it is highest in people who do not drink alcohol and abuse alcohol. On the contrary, in people who drink alcohol moderately, mortality is at the lowest level. The mechanism of the positive effect of small and moderate doses of alcohol is that it increases the level of HDL in the blood and, in particular, increases the cholesterol content in this fraction of lipoproteins, which in turn inhibits the development of atherosclerosis. It was also established that alcohol, taken in small doses, inhibits platelet aggregation, increases fibrinolytic activity of blood, and reduces psychoemotional stress. [1].

Under moderate doses of alcohol, the following is meant: for men - no more than 20-30 g of ethanol per day (50-60 ml of vodka or cognac, or 200-250 ml of dry wine, or 500-600 ml of beer), for women - up to 10-20 g, that is, half as much. Currently, it is believed that with moderate consumption of alcohol, it is preferable to dry red grape wine, then beer.

Antioxidants. In some trials found reduced CVD in those taking large amounts of antioxidant vitamins, other found no benefit for 400 and 300 IU/d of vitamin E, respectively. A current meta-analysis of available data suggests no benefit for antioxidant vitamins.

Herbals. Alternative medicine approaches to cholesterol lowering include garlic, policosanol, gugulipid, and red rice yeast extracts, the latter of which contains HMG-CoA reductase inhibitors. Garlic modestly lowers cholesterol

(approximately 3%) and may lower BP and inhibit platelet aggregation. Fermented red rice yeast extracts contain statins and lower cholesterol 13-26%. Ephedra-containing herbals, often used as anorexics, are associated with hypertension and stroke.

Physical Activity. According to WHO, physical activity is any body movement produced by skeletal muscles that requires energy expenditure, including activity during work, games, homework, travel and recreational activities. [2]. Insufficient physical activity is one of the main risk factors for death in the world. Insufficient physical activity is a major risk factor for the development of noncommunicable diseases (NCDs), such as cardiovascular diseases, cancer and diabetes.Physical activity has important health benefits and helps prevent NCDs. Every fourth adult in the world is not very active.More than 80% of teenagers around the world lack physical activity.

The following general principles need to be considered in recommending increased physical activity:

- Increased physical activity begins with increasing lifestyle activities, such as walking.
- A complete exercise program includes aerobic exercise, resistive training, and stretching.
- More frequent exercise, optimally daily, provides more benefit.
- More strenuous exercise, such as jogging, provides more benefit. A good goal is 75% of age-predicted maximal heart rate (220 - age of individual).
- Excellent benefit can be derived from 30 minutes of daily exercise.
- Even 15 minutes a day or 90 minutes a week of moderate-intensity exercise may be beneficial.
- Elevated waist circumference and physical inactivity are associated with an increased risk of coronary heart disease [1].

Smoking. Smoking cessation is the most cost-effective preventive measure, estimated at $220 per year of life saved. Individuals aged 30 years gain 3-5 years of life by stopping smoking and the mortality benefit was equally impressive in elderly populations. The most effective smoking cessation programs involve programmatic and/or group support and the use of nicotine substitutes and antidepressants, such as bupropion. Varenicline is a recent addition to the armamentarium and has been found to be superior to bupropion in this respect.

Smoking is a risk factor for CVD in women and men; however, a systemic review and suggests that in some countries, smoking by women is on the rise; proper counseling and nicotine addiction programs should focus on young women.

Smoking cessation counseling with supportive contact after a patient with acute myocardial infarction is discharged is potentially cost-effective and may reduce the incidence of smoking and further adverse health events [2].

Secondary prevention (after development of CHD).The overall mortality risk of smokers who quit decreases by 50% in the first couple of years and tends to approach that of nonsmokers in approximately 5-15 years of cessation of smoking.

Primary prevention should start with lifestyle modification, including weight management, diet, physical activity, and smoking cessation. Hormone therapy increases cardiovascular events in postmenopausal women. Estrogen alone increases stroke, but it does not alter CHD events.

Aspirin use (75-162 mg/d) decreases the occurrence of primary MI by 25-33% and has also been shown to decrease death due to vascular causes; these benefits are not gender specific. However, all benefits have to be balanced against the risk of GI bleeding. Low-dose aspirin therapy (75 mg/d) is therefore recommended for primary prevention in individuals with a 10-year Framingham coronary risk estimate greater than 10%, outweighing risks of gastrointestinal hemorrhage and hemorrhagic stroke. Aspirin has been shown to be similarly efficacious in secondary prevention of MI, stroke, and death secondary to vascular causes. However, others suggest aspirin has only modest benefit in patients without clinical cardiovascular disease and this benefit is offset by its risk [2].

Classification of Recommendations. Recommendations made herein are based largely on major practice guidelines from ACC/AHA. The information presented is adapted from recent statements by the AHA/ACC, which involved the process of partial adaptation of other guideline statements and reports and supplemental literature searches.

Classification of recommendations and level of evidence is as follows:

Class I - Conditions for which there is evidence and/or general agreement that a given procedure or treatment is beneficial, useful, and effective.

Class II - Conditions for which there is conflicting evidence and/or a divergence of opinion about the usefulness/efficacy of a procedure or treatment.

Class IIa - Weight or evidence/opinion is in favor or usefulness/efficacy.

Class IIb - Usefulness/efficacy is less well established by evidence/opinion.

Class III - Conditions for which there is evidence and/or general agreement that a procedure/treatment is not useful/effective and in some cases may be harmful.

Level of evidence is as follows:

Level of evidence A - Data derived from multiple randomized clinical trials or meta-analyses.

Level of evidence B - Data derived from single randomized trial or nonrandomized studies.

Level of evidence C - Only consensus opinion or experts, case studies, or standard-of-care [1,2].

Secondary Prevention Goals and Management. Patients covered by these guidelines include those with established coronary and other atherosclerotic vascular disease, including peripheral arterial disease, atherosclerotic aortic disease, and carotid artery disease. Treatment for patients whose only manifestation of cardiovascular risk is diabetes will be the topic of a separate AHA scientific statement.

Smoking cessation. The goal is complete cessation and no exposure to environmental tobacco smoke.

- Ask the patient about tobacco use status at every visit. I (B)
- Advise every patient who uses tobacco to quit. I (B)
- Assess the patient’s willingness to quit using tobacco. I (B)
- Assist the patient by counseling and developing a plan for quitting. I (B)
- Arrange follow-up, referral to special programs, or pharmacotherapy (including nicotine replacement and bupropion). I (B)
- Urge the patient to avoid exposure to environmental tobacco smoke at work and home. I (B)

Blood pressure control. In patients with established ischemic heart disease, diabetes or chronic kidney disease, the target blood pressure level is below 140/90 mm Hg. and the choice of antihypertensive drugs depends on the main CVD, concomitant diseases, as well as on the presence or absence of other cardiovascular risk factors.

- The decision to start therapy in "asymptomatic" patients depends not only on the level of blood pressure, but also on the assessment of the overall cardiovascular risk and the presence or absence of target organ damage. I (A)

Diet. All individuals should receive professional advice on food choices and follow a diet that is associated with a minimal risk of CVD.

General recommendations (determined in accordance with cultural traditions):

• food should be varied, energy consumption should be optimal to maintain an ideal weight;

• Consumption of the following foods should be encouraged: fruits and vegetables, whole grains of cereals and bread, low-fat dairy products, lean meat, fish;

• eat foods containing fish oil and w-3 fatty acids, which have special protective properties;

• the total fat content should not be more than 30% of the total energy composition, and the saturated fat content should not exceed a third of all consumed fats; the amount of CS consumed should be less than 300 mg / day;

• for an isocaloric diet, saturated fats should be replaced in part by carbohydrates, in part by monounsaturated and polyunsaturated fats from vegetables and marine animals.

Patients with hypertension, diabetes, hypercholesterolemia or other dyslipidemias should receive special dietary advice. [1,2].

Lipid management. In the general population, the serum cholesterol level should be below 5 mmol / L (190 mg / dl), and the LDL cholesterol level below 3 mmol / L (115 mg / dL). In patients with clinical manifestations of CVD, as well as in patients with diabetes, the target levels should be lower: for total cholesterol less than 4.5 mmol / L (175 mg / dL) and for LDL-C - less than 2.5 mmol / L (100 mg / dL).

Target levels for HDL cholesterol and triglycerides have not been established, but HDL cholesterol levels are below 1 mmol / L (40 mg / dl) in men and below 1.2 mmol / L (46 mg / dl) in women, and triglycerides above 1 , 7 mmol / L (150 mg / dl) are markers of high cardiovascular risk.

In "asymptomatic" patients, the decision to initiate therapy depends not only on the level of lipids, but also on the assessment of overall cardiovascular risk.

To encourage treatment compliance, particularly with cardiovascular medications in secondary prevention, physician should provide not only clear discussions about the risk of disease recurrence and medication-specific information at the start of pharmacotherapy, but they should ease the transition between primary and secondary care [1].

The level of total cholesterol in a healthy person should be below 5 mmol / L, and the level of low-density lipoprotein cholesterol (LDL) is below 3 mmol / l. For patients with clinical manifestations of cardiovascular disease or diabetes mellitus, the target levels of TC and LDL-C are reduced to <4.5 mmol / L and <2.5 mmol / L, respectively.

Target levels for triglycerides (TG) and high-density lipoprotein cholesterol have not been determined, but the levels that should be considered for risk assessment, as well as the choice of hypolipidemic therapy, are indicated. Increased risk is considered at a level of high-density lipoprotein cholesterol <1.0 mmol / l in men and less than 1.2 mmol / l in women; as well as at a TG level of more than 1.7 mmol.

In patients without symptoms with several risk factors for CVD and with levels of total cholesterol and LDL close to 5 and 3 mmol / L, respectively, in most cases, it is possible to reduce the risk with small doses of lipid-lowering drugs. However, in the same population category, but with a high cholesterol level, these "new" target levels should not be used.

If the 10-year risk of death from CVD is 5% or more, or if this risk is expected at the age of 60 years in this patient, then a complete lipid analysis is necessary. The patient is given advice on the intensive lifestyle change, especially the diet. If, as a result of a non-drug lifestyle correction, the levels of total cholesterol and LDL become lover than 5 and 3 mmol / L, respectively, and the risk of CVD is less than 5%, then such patients are recommended to observe without additional interventions, annually repeating the risk assessment. On the contrary, if the risk persists at 5% or higher, the use of medications is recommended, even if the initial target cholesterol levels are reached. In patients with persistent high risk, the target levels of OXC and LDL-C should be <4.5 and <2.5 mmol / L, respectively. As mentioned above, this does not apply to patients with high cholesterol levels before prescribing. The first clinical studies in which the clinical effect of lipid-lowering statin therapy on survival was demonstrated was limited to patients younger than

70 years with a TC level greater than 5 mmol / l. In a number of recently completed studies, it was possible to obtain an effect in older patients and at lower cholesterol levels.

Some patients require combined lipid-lowering therapy. In patients with multiple diseases requiring drug therapy, polypharmacy becomes a serious problem and an appropriate clinical approach. Part of the patients can not reach the target cholesterol levels, despite the maximum therapy. Nevertheless, the clinical efficacy of lipid-lowering drugs is also noted in this group of patients, to the extent that lipid reduction is achieved. [2].

The intensive statin dosing reduces the risk of nonfatal events (coronary heart disease and nonfatal myocardial infarction) and may have a role in reducing mortality. However, the benefits of high-dose statins must be weighed against the risk of myopathy, including rhabdomyolysis, at high doses.

Lowering LDL cholesterol with statin regimens may have an effect in people with moderate-to-severe kidney disease. Simvastatin (20 mg) plus ezetimibe (10 mg) daily safely reduces the incidence of major atherosclerotic events in a wide range of patients with advanced chronic kidney disease.

Statin drugs reduced all-cause mortality, cardiovascular mortality, coronary events, coronary revascularization, stroke, and intermittent claudication. Statin therapy significantly decreases cardiovascular events and all-cause mortality in both women and men [1,2].

Lipid-lowering therapy is associated with delayed cardiovascular events and prolonged survival in patients with homozygous familial hypercholesterolemia.

Physical activity. All patients need to be professionally explained that an increase in their physical activity is associated with the lowest risk of developing CVD. Although physical exercises lasting at least half an hour a day on most days of the week are targeted, more moderate activity is also associated with health benefits.

Healthy people should be recommended physical activity corresponding to their daily regimen, preferably 30-45 minutes 4-5 times a week with reaching a heart rate of up to 60-75% maximum. For patients with established CVD, the recommendations should be based on a comprehensive clinical examination, including the results of the loading test. [1].

Weight management. Preventing excess weight or reducing an already existing one is an important goal. The initial goal of weight loss therapy should be to reduce body weight by approximately 10% from baseline. I (B)

- Weight reduction is strongly recommended for obese people (BMI over 30 kg / m2) and overweight people (BMI more than 25 and less than 30 kg / m2), as well as for patients with an increase in abdominal adipose tissue, which is estimated around the waist circumference (in men - more than 102 sm, in women more than 88 sm). I (B)
- Restriction of total calorie intake and regular exercise should be recommended to patients with obesity or overweight.

Maintaining or improving fitness is associated with a lower risk of all-cause and CVD mortality in men. Health care providers should encourage men to exercise regularly, regardless of age, as it is important for longevity regardless of BMI change [14].

Diabetes management. The goal of diabetes management is to maintain glycosylated hemoglobin (HbA1c) concentration of < 7%.

Control of postprandial glycemia has a more pronounced effect on cardiovascular and overall mortality than the reduction in fasting glycemia. In the German Diabetes Intervention Study, inadequate control of fasting glycemia was not accompanied by a significant increase risk of death or MI, while insufficient control of post-prandial glycemia was associated with significant increase in mortality.

The maximum increase in mortality from cardiovascular disease was found in patients with impaired glucose tolerance, especially with normal fasting glycemia. In this regard, more attention should be paid to identifying these patients through systematic screening in high-risk groups.

Antiplatelet agents and anticoagulants:

The need for double antiplatelet therapy (DAT) in patients with STEMI and NSTE ACS has been demonstrated in large clinical randomized trials and is presented in all international guidelines.

According to the recommendations of the European Society of Cardiology (ESC, 2014), patients with STEMI undergoing PKV, acetylsalicylic acid (ASA) are prescribed for oral administration at a loading dose of 150-300 mg and then at a dose of 75-100 mg / day for a long time (IA). Together with ASA, inhibitors of

P2Y12 receptors are prescribed: in the loading dose during the first medical contact and in the maintenance dose for at least 12 months in the absence of an excessive risk of bleeding. In the ESC 2014 manual, the following components are recommended as the second component of DAT: clopidogrel (loading dose 600 mg, support - 75 mg / day); prasugrel (loading dose - 60 mg, supporting - 10 mg / day); ticagrelor (loading - 180 mg, supporting - 90 mg 2 times a day). The use of GP IIb / IIIa receptor blockers is discussed only in the case of thrombotic complications in subcutaneous coronary intervention. [1].

Renin, angiotensin, and aldosterone system blockers.

It is known that aldosterone has a direct damaging effect on the myocardium and leads to disruption of its functions, which can cause the progression of heart failure (CH), in addition, it contributes to the enhancement of collagen formation and the progression of CKD. In addition, the level of aldosterone in the blood plasma is not only a marker of overall mortality, but also a predictor of the development of heart failure, ventricular arrhythmia and other diseases of the cardiovascular system. Thus, the use of aldosterone blockers positively affects the survival of patients with CVD, and also improves the clinical outcome in such patients.

Today in Europe, major clinical studies using aldosterone blockers have been carried out. In the RALES (The Randomized Aldoctone Evaluation Study), patients with severe heart failure who received angiotensin-converting enzyme (ACE inhibitors) and loop diuretics, some with digoxin, participated. The study compared the effectiveness of the blocker aldosterone (spironolactone) and placebo. The results of the study demonstrate that among patients taking aldosterone blockers, the overall mortality is 30% lower than in the placebo group. The design of the ERESESUS study (Eplerenone Post-Acute Myocardial Infarction Heart Failure Efficacy and Survival Study) involved the involvement of patients who underwent MI with LV dysfunction and signs of HF who received eplerenone or placebo (in addition to therapy with ACE inhibitors and β-adrenoreceptor blockers). The results of this study also confirmed the effectiveness of the use of the aldosterone blocker - in the main group, mortality from all causes decreased by 31%.

The ACC / AHA guidelines of the American College of Cardiology / American Heart Association (2007) indicate that long-term therapy with

aldosterone blockers should be administered to patients who underwent ST-segment elevation myocardial infarction (STEMI) with LV ejection fraction ≤40%, signs of heart failure or diabetes mellitus (DM), as well as no significant renal dysfunction or hyperkalemia (potassium level in blood plasma ≤5.0 mmol / l), despite the use of ACE inhibitors in therapeutic doses. Renal impairment refers to creatinine levels for men ≥2.5 mg / dl and ≥2 mg / dL for women (grade of evidence I, level of evidence A).

Currently, the following classes of drugs acting on the renin-angiotensin-aldosterone system (RAAS) are being used in clinical practice: IAPF, angiotensin II receptor blockers, aldosterone antagonists and direct renin inhibitors. Each of these classes of medicines occupies an important place in the treatment of patients with high CVR. For a number of drugs that affect the activity of RAAS, in large randomized trials, evidence of their organoprotective potential is presented.

One of the key positions in modern guidelines for management of patients with high CVR is the need to use antihypertensive drugs, not only able to reduce blood pressure, but also have marked cardio, nephro, angio and cerebroprotective properties, and also improve the prognosis of the disease (Casas JP et al., 2005). These criteria include drugs that inhibit the activity of RAAS, including ACE inhibitors and angiotensin receptor blockers (sartans). [11].

Beta-blockers:

With the appointment of BB for the treatment of CVD, the selective blockade of β1-adrenergic receptors protects the heart from hypersympathicotonia, which leads to a slowing of the heart rate, a negative inotropic effect and, as a consequence, a decrease in myocardial oxygen demand.

In the RCT of the 80s of the last century, the high efficacy of BB in the treatment of AH and CHD was demonstrated. In more recent studies, it has been found that the use of BB causes a significant reduction in mortality in CHF. This not only increased the indications for the use of BB in CVD, but also changed the views on the pathogenesis of CHF in general. The latest studies of the 21st century open new prospects for the use of BB, in particular, their anti-atherosclerotic effects present new information about the key process of the cardiovascular continuum - atherogenesis.

Currently, doctors have a wide choice of drugs of this class, the effectiveness of which in the treatment of CVD has the highest level of evidence. [16].

Influenza vaccination: patients with cardiovascular disease should have an influenza vaccination. I (B)

Women and Coronary Artery Disease. Compared with men, LDL cholesterol is lower and HDL cholesterol is higher in women before menopause. Although women have lower rates of hypertension and cigarette smoking than men, rates for obesity and diabetes mellitus are higher. Diabetes mellitus is a particularly serious risk factor in women, tripling the risk of cardiovascular death and causing diabetic women to have the same frequency of CVD as diabetic men. HDL cholesterol and triglyceride levels are more predictive of CVD in women than in men. Women have been noted to have similar or slightly higher prevalence of stable angina as compared to men [12].

It is now known that women tend to present more commonly with unstable angina as compared to men, the reverse of which is true for MI. However, when women do present with MI, they are more likely to have Q wave rather than non-Q wave. Mortality rates of MI and CABG are about 50% higher in women, mostly related to older age of onset. Lipid lowering has shown similar efficacy in women and men in the angiographic progression and event trials. Cardioprotective agents, including aspirin, beta-blockers, and ACE inhibitors, appear to have similar efficacy in men and women.

Hormone therapy is no longer recommended to prevent coronary events in postmenopausal women with or without established CHD. Although hormone therapy improves LDL and HDL cholesterol levels, it also increases coagulation and inflammation (as measured by C-reactive protein) and decreases LDL particle size. Treatment rates for risk factors in women tend to be even lower than in men, as are rates for coronary angiography and coronary artery revascularization following presentation with chest pain [1].

Women who may have had radiotherapy through the mid-1980s to treat breast cancer are also at an increased risk of mortality from cardiovascular disease. The concern is even greater if the woman was treated for a left-sided breast cancer with contemporary tangential breast or chest wall radiotherapy.

HIV/AIDS.

Definition:

• HIV infection is anthroponosis. Animals in vivo HIV-1 do not become infected, and attempts at experimental infection of monkeys result in their rapid recovery.

Epidemiology:

• ~34 million individuals worldwide;

• 6th leading cause of death in 25–44-y age group

• Routes:

The source of HIV infection is an infected person who is at any stage of the disease, including during the incubation period.

Biological human substrates containing HIV and having the greatest epidemiological significance in the spread of HIV infection:

- blood
- semen and predyakulyat
- vaginal and cervical secret
- mother's breast milk

The virus can be found in other substrates (but its concentration in them is small or the substrate is inaccessible, as, for example, the cerebrospinal fluid):

- cerebrospinal fluid (cerebrospinal fluid)
- urine
- saliva
- lacrimal fluid
- secret sweat glands [15].

• Postexposure (risk infection ~0.3%).Prophylaxis: 2 nucleoside reverse transcriptase inhibitor (+protease inhibitoror non-nucleoside reverse transcriptase inhibitorif high-risk) × 4 wk [1,2].

Acute retroviral syndrome (ARS):

The acute retroviral syndrome (ARS), or "seroconversion illness," is an important issue for primary care, urgent care, and emergency department providers because infected persons are likely to initially present in these settings. This is in contrast to the experience of specialists in HIV care and providers in HIV treatment programs who generally do not see a person with primary HIV infection, unless he or she is referred with this diagnosis already established.

Flu-like symptoms of acute HIV infection that may appear approximately 1 to 4 weeks after infection. Symptoms such as fever, headache, fatigue, and swollen

lymph nodes can last from 1 to 4 weeks, and then subside. During the acute stage of HIV infection, many, but not all, people will have symptoms of acute retroviral syndrome.

For patients who have symptoms consistent with seroconversion illness and a recent history of possible HIV exposure, an HIV RNA test should be performed in addition to the standard screening HIV antibody test.4 State or local regulations concerning written informed consent for HIV testing apply in this case as well. Since some laboratories do not perform HIV RNA tests without a confirmed positive antibody test result, it is important to include the diagnosis of ARS (International Classification of Diseases-9 code V08) on the requisition.

The diagnosis of ARS, or seroconversion illness, will likely require 2 patient visits. If rapid HIV testing is available, it can be done on the first visit. The HIV RNA test result, with blood drawn during that same visit, will probably take longer, so patients will need to return for those results and additional discussion.

Patients with negative antibody test results but high HIV RNA levels (greater than 100,000 copies/mL) can be considered to be infected with HIV, although the screening antibody test should be repeated later to confirm seroconversion.

A low HIV RNA level (less than 1000 copies/mL) usually indicates a false-positive result at this stage because levels are typically very high (often above 1 million copies/mL) in acute infection. Antibody testing should be repeated in 4 to 6 weeks in patients who have indeterminate HIV antibody test results, low HIV RNA levels, and no clear HIV risk factors for or symptoms of primary HIV infection. Indeterminate results rarely indicate evolving seroconversion in persons without significant risk factors.

It is reasonable to consider starting potent antiretroviral therapy in persons with acute HIV infection, but the final decision needs to be discussed with the person and is best managed by an experienced HIV provider. Limited data suggest that treatment initiated during the first 2 weeks of primary HIV infection may preserve HIV-specific immune function, which would otherwise be lost as HIV infection progresses. However, the longer-term immunological, virological, or clinical benefits of early treatment are yet to be defined.

For patients who choose to start therapy during primary HIV infection, the choice of drug therapy and patient monitoring is similar to that for the treatment of

chronic HIV infection. The initial goal of therapy in primary HIV infection should be to suppress the number of HIV RNA copies to undetectable levels.

The decision to treat primary infection should also be weighed against the likelihood of patient adherence to treatment and the risk of short- and long-term toxicities in patients with newly diagnosed HIV infection. Consultation with an HIV expert should be done for recommendations on treatment. Referral to a clinical trial should be considered if available.[1,2].

TESTS FOR FINAL CONTROL

1. Risk Factors for chronic bronchitis, emphysema, and airways obstruction are the following:

A. Cigarette smoking, Occupation, Familial and genetic factors
B. Air pollution, Occupation, Familial and genetic factors
C. Occupation, Cigarette smoking, Infection
D. Infection, Alpha1-Antitrypsin Deficiency
E. All of mentioned above

2. The prolonged cigarette smoking impairs by:

A. impairs ciliary movement
B. inhibits function of alveolar macrophages
C. leads to hypertrophy and hyperplasia of mucus-secreting glands
D. inhibits antiproteases, causes polymorphonuclear leukocytes to release proteolytic enzymes
E. All of mentioned above

3. Passive exposure to tobacco smoke correlates with following symptoms:

A. slowing of the decline in lung function
B. rapid progression in patients with chronic airways obstruction
C. cough, wheeze, and sputum production
D. increased airways responsiveness
E. vagally mediated smooth-muscle constriction

4. Chronic bronchitis is more prevalent in workers who engage in following occupations:

A. exposing to either inorganic or organic dusts or to noxious gases
B. plastics plants exposed to toluene diisocyanate
C. carding room workers in cotton mills
D. heavy pollution with sulfur dioxide
E. All of mentioned above

5. Carcinogenesis from tobacco use occurs through several mechanisms, including:
A. direct delivery of carcinogens to tissues
B. direct delivery of carcinogens to tissues, inflammation, and breakdown of physiologic barriers
C. autoimmune inflammation
D. mechanical breakdown of physiologic barriers
E. mechanical breakdown of tissues

6. The following risk factors are assessed as modifiable:
A. Age, smoking, atherogenic diet, alcohol intake, physical activity, dyslipidemias, hypertension, obesity, diabetes, metabolic syndrome
B. Smoking, sex, atherogenic diet, alcohol intake, physical activity, dyslipidemias, hypertension, obesity, diabetes, metabolic syndrome
C. Smoking, atherogenic diet, alcohol intake, physical activity, dyslipidemias, hypertension, obesity, diabetes, metabolic syndrome
D. Smoking, family history, atherogenic diet, alcohol intake, physical activity, dyslipidemias, hypertension, obesity, diabetes, metabolic syndrome
E. Smoking, sex, genetic, atherogenic diet, alcohol intake, physical activity, dyslipidemias, hypertension, obesity, diabetes, metabolic syndrome

7. Before the management of elevated blood cholesterol is initiated, the following potential secondary causes of high LDL should be considered:
A. Hypothyroidism, nephrotic syndrome, and primary biliary cirrhosis
B. Hypothyroidism, primary biliary cirrhosis, and anorexia nervosa
C. Hypothyroidism, nephrotic syndrome, primary biliary cirrhosis, and anorexia nervosa
D. Hypothyroidism, nephrotic syndrome, cirrhosis, and excessive physical exercise

E. Hyperthyroidism, nephrotic syndrome, and anorexia nervosa

8. Before the management of elevated blood cholesterol is initiated, the following potential secondary causes of hypertriglyceridemia should be considered:

A. Diabetes mellitus, chronic kidney disease, alcoholism, pregnancy, hypothyroidism, cirrhosis
B. Diabetes mellitus, chronic kidney disease, alcoholism, pregnancy, hypothyroidism
C. Diabetes mellitus, cirrhosis, alcoholism, pregnancy, hypothyroidism
D. Diabetes mellitus, chronic kidney disease, alcoholism, pregnancy, hyperthyroidism
E. Diabetes mellitus, chronic kidney and liver disease, alcoholism

9. General Nutritional Recommendations for prevention of cardiovascular disease recommend, except:

A. Eat a variety of fruits; vegetables; legumes; nuts; soy products; low-fat dairy products; and whole grain breads, cereals, and pastas; baked or broiled fish at least twice per week
B. Choose oils and margarines low in saturated fat and high in omega-3 fat, such as canola, soybean, walnut, and flaxseed oils, including those fortified with stanols and sterols
C. Avoid fatty fish
D. Limit alcohol consumption to no more than 2 drinks per day for a man or 1 drink per day for a woman
E. Eat less than 6 g of salt or <2400 mg/d of sodium

10. For prevention of cardiovascular disease the goal BP for patient with diabetes or chronic kidney disease is:

A. BP <120/80 mm Hg or <110/70 mm Hg
B. BP <135/90 mm Hg or <120/80 mm Hg
C. BP <160/90 mm Hg or <140/80 mm Hg
D. BP <140/90 mm Hg or <130/80 mm Hg
E. BP <130/90 mm Hg or <120/80 mm Hg

Answers:

1	2	3	4	5	6	7	8	9	10
E	**E**	**C**	**E**	**B**	**C**	**C**	**B**	**C**	**D**

TASKS FOR FINAL CONTROL

1. Calculate a body mass index of woman of 35 years old. She is a doctor; her height is 165 cm, body mass 55 kg; define her day's calorie content of food, the rate of albumens, fats and carbohydrates in her ration.

2. Man of 45 years old smokes 1 pack of cigarettes per day; height is 175 cm, body mass is 95 kg, abdominal circumference 105 cm; 3 years history of arterial hypertension (BP 160/100 mmHg), he takes medicine periodically, total cholesterol level 5,8 mmol/l, a dietary intake with fat, potato, vegetables; his father had essential hypertension since young years.

- Stratify of risk by scale SCORE
- Stratify the additional risk for arterial hypertension
- Define a body mass index
- Recommend the life style modifications.
- Prescribe treatment.
- Define target level of cholesterol.

3. Woman of 45 years old; she is smoking; BP 140/80 mmHg; her father died because of stroke in the age of 48 years old; glucose is 4,5 mmol/l, weight - 75 kg, total cholesterol level - 5,5 mmol/l, height - 165 cm.

- Calculate a body mass index.
- Stratify risk by scale SCORE
- Stratify the additional risk for arterial hypertension.
- Recommend the life style modifications.
- Prescribe treatment.
- Define target level of cholesterol.
- Perform hygienic education of patient: harmful impact of smoking.

TOPIC 4
THE CHRONIC NON-EPIDEMIC DISEASES. THE ALHORHYTM OF FD IN THE CASE OF CARDIO-VASCULAR DISEASES. THE METHOD AND ASSESSMENT OF ECG

I. Theme actuality. The symptoms caused by heart disease result most commonly from myocardial ischemia, from disturbance of the contraction and/or relaxation of the myocardium, from obstruction to blood flow, or from an abnormal cardiac rhythm or rate. Ischemia is manifest most frequently as chest discomfort, while reduction of the pumping ability of the heart commonly leads to weakness and fatigability or, when severe, produces cyanosis, hypotension, syncope, and elevated intravascular pressure behind a failing ventricle; the latter results in abnormal fluid accumulation, which in turn leads to dyspnea, orthopnea, and systemic or pulmonary edema[12]. Obstruction to blood flow, as in valvular stenosis, can cause symptoms resembling those resulting from congestive heart failure. Cardiac arrhythmias often develop suddenly, and the resulting signs and symptoms - palpitation, dyspnea, angina, hypotension, and syncope - generally occur abruptly and may disappear as rapidly as they develop. A cardinal principle useful in the evaluation of the patient with suspected heart disease is that myocardial or coronary function that may be adequate at rest may be inadequate during exertion. Thus a history of chest discomfort and/or dyspnea that appears only during activity is characteristic of heart disease, while the opposite pattern, i.e., the appearance of these symptoms at rest and their remission during exertion, is rarely observed in patients with organic heart disease.

Patients with cardiovascular disease also may be asymptomatic, both at rest and during exertion, but may present an abnormal physical finding, such as a heart murmur, elevated arterial pressure, or an abnormality of the ECG or of the cardiac silhouette on the chest roentgenogram. Patients may exhibit asymptomatic ischemia on an exercise stress test or an ambulatory ECG [12].

Diseases of the heart and circulation are so common and the laity is so well acquainted with the major symptoms resulting from disorders those patients, and occasionally physicians, erroneously attribute many noncardiac complaints to cardiovascular disease.

II. Study purposes: to know the basic principles of organization of out-patient care in the case of cardio-vascular diseases, the curing algorithms of out-patient care, the expertise of disability.

III. Concrete purposes of the module: to plan the out-patient examination and treatment in the case of cardiovascular diseases, the expertise of disability.

IV. A student must be able the interview of patient, assess medical history, life history, clinical examination of patient, distinguish symptoms and syndromes of diseases, to make differential diagnosis, to prescribe treatment, to expertise disability.

V. Task for initial independent training

1. FD's tactics in the case of acute coronary syndrome:

A. Urgent admission to specialized intensive care unit of cardiology department.
B. Out-patient treatment.
C. Planned admission to therapeutic department.
D. Tactics will be determined after routine examination of the patient.
E. Only patients with ECG changes are admitted.

2. The healthy man of 28 years old felt acute left side chest pain, hypopnoea, palpitations, dry cough. Physical examination: acrocyanosis, restriction of respiratory excursions, percussion - left tympanic, auscultation - diminished breath sounds. What is most informative diagnostic method?

A. Thoracoscopy;
B. Bronchoscopy;
C. Computer tomography;
D. Angiography;
E. chest X-ray.

3. Differentiation criterion of II A and I stages of left-sided type heart failure:

A. increased BP
B. acute peripheral edema
C. tachycardia in the rest
D. symptom of large circulation engorgement
E. symptomof small circulation engorgement

4. Most typical clinical symptom of stable angina pectoris:

A. squeezing pain
B. retrosternalpain
C. efficiency to nitroglycerine
D. irradiation of pain
E. normal ECG during attack and after the physical loading

5.The patient 55 years old had myocardial infarction a few years ago.During last months he has BP 160/100 mmHg. Family history:arterial hypertension. What hypotension drugs will you prescribe?

A. β-adrenoblocker
B. diuretics
C. ACE inhibitors
D. direct action vasodilators
E. ACE inhibitors or β-adrenoblocker

6. An indications is to the conducting of day's monitor ABP:

A. detection arterial hypertension
B. differential diagnosis of arterial hypertension and hypertension “white a dressing-gown”
C. valuing to character of arterial hypertension and influence of different factors
D. detection hypotension, valuing to efficiency of therapy
E. all of mentioned above

7. Character of beginning of pain is at the angina of effort:

A. without precursors, sudden, on height of the physical loading, gradually grows to the peak of intensity in the form of crescendo
B. after auras
C. maximum intensity will attack at the beginning
D. pain grows undulating
E. in 4-6 hours after loading, maximum on 2-3 days

8. A patient which long time suffers on a gout and essential hypertension entered induction centre of hospital with the signs of polyarthritis and increase of ABP to 170/100 mm hg. p. What hypotension drugs are contra-indicated in this case?

A. diuretics
B. antagonist to the calcium
C. ACE inhibitors
D. β-adrenoblocker
E. direct action vasodilators

9. In the case of angina the typical pain is:

A. Pressing, squeezing, localized behind the breastbone.
B. Burning heart pain.
C. Barbed heart pain associated with movements or breathing.
D. Feeling of discomfort in the pericardial region during physical or emotional stress.
E. Feeling heterogonous object under the sternum.

10. The patients with isolated systolic AH is attributed to the group:

A. Low risk of cardiovascular complications
B. the middle risk of cardiovascular complications
C. the high risk of cardiovascular complications
D. no risk of cardiovascular complications
E. neoplasm risk

Answers:

1	2	3	4	5	6	7	8	9	10
A	**E**	**E**	**C**	**E**	**E**	**A**	**A**	**A**	**C**

VI. Basic questions after a theme:

- The arterial hypertension in the practice of FD: first signs, diagnostics and differential diagnosis, treatment, pharmacotherapy. Emergency in the case of hypertensive crisis on the pre-admission stage. The primary and secondary preventions. The prophylactic medical examination. The expertise of disability.

- The chest pain in the practice of FD: differential diagnosis, work-up, diagnosis verification, and emergency. The arrhythmia, the telemetric assessment of ECG and cardiologist consultation. The prophylactic medical examination. The expertise of disability.
- Chronic heart failure in the practice of FD: diagnostics, etiology, pathogenesis, classification, clinical protocols of treatment. The prophylactic medical examination. The expertise of disability. The patient education. ECG registration and assessment.
- Acute and chronic cerebrovascular diseases: the diagnostics, management plan, emergency, rehabilitation. The prevention of thromboembolic complications.
- Dyslipidemia and metabolic syndrome: screening, treatment and preventive approach.
- The management of out-patients with anemia. The prevention. The prophylactic medical examination. Resort treatment. The expertise of disability.

VII. Practical skills:practical class in a out-patient's clinic, students together with family doctors perform the examination of patientswith cardio-vascular diseases, compose the individual workout and management program, medico-social expertise of disability.

The appointment of patient with arterial hypertension, chest pain, chronic heart failure.To fill a medical certificate in different situation.

IX. The content of theme

The establishment of a correct and complete cardiac diagnosis often requires the use of six different methods of examination: 1) history, 2) physical examination, 3) ECG, 4) chest roentgenogram, 5) noninvasive graphic examinations (echocardiogram, radionuclide and other noninvasive imaging techniques), and occasionally 6) specialized invasive examinations, i.e., cardiac catheterization, angiocardiography, and coronary arteriography [12].

HYPERTENSION

Arterial hypertension (hypertension) is a syndrome characterized by increased blood pressure.

Blood pressure **(**BP) should be determined by making ≥2 measurements separated by >2 min. Confirm stage 1 within 2 mo; can therapy stage 2 immediately.

Epidemiology

• Prevalence 30% in U.S. adults;

• Only 50% of patients with diagnosis (dx) of hypertension have adequate BP control

Arterial hypertension is one of the most common chronic diseases in humans. According to official statistics, in 2007, over 11 million people with hypertension registered in Ukraine, accounting for 29.9% of the adult population.

Classification

Essential hypertension (primary hypertension or hypertonic disease) is an increased blood pressure in the absence of an obvious cause for its elevation.

Secondary hypertension (symptomatic) is hypertension, the cause of which can be detected.

The origin and the course of hypertension are closely related to the presence of risk factors.

• Age. There is a positive relationship between AD and age. In general, the level of diastolic blood pressure rises to 55 years, then changes little. Systolic blood pressure is constantly increasing with age.

• Gender. The average levels of blood pressure and prevalence of hypertension in young and middle-aged women are somewhat lower than in men. Later, this dependence changes up to the reversal.

• Heredity is one of the most influential factors in the future development of hypertension. A close correlation between the blood vessels of the nearest relatives (parents, brothers, sisters) was revealed.

• Body weight. Correlation between body weight and blood pressure level is straightforward, significant and stable. Excess weight is associated with a 2-6 fold increase in the risk of hypertension.

• Alimentary factors:

- Kitchen salt. Its use exceeds the physiological norm positively correlates with the level of blood pressure.
- Other trace elements. There is a feedback between the use of K +, Ca2 + and Mg 2+ and the level of blood pressure.
- Macroelements: proteins, fats, carbohydrates, edible fibers. Prevalence in the diet of vegetables and fruits, fish, white chicken meat, restrictions on the

use of animal fats, cholesterol and sweets contributes to a decrease in blood pressure.

- Coffee and caffeine. Recovery of the pressor effect of caffeine occurs a few hours after drinking coffee. AG occurs three times more often among those who take 1 to 5 cups of coffee per day compared to those who do not drink coffee at all. Caffeine, contained in strong coffee, increases GAT in men with hypertension at 8 mm Hg, and in people with normal blood pressure - at 3 mm Hg. Art.

- Alcohol The use of alcohol directly correlates with the level of blood pressure, both episodic and chronic. Dependence between the use of alcohol and the prevalence of hypertension is similar to the J-shaped curve. Hypoglycaemia is the lowest among alcohol users in individual cases and is gradually increasing, depending on the increase in the daily amount of alcoholic beverages used.

• Smoking. Nicotine sharply raises blood pressure even in the hard smokers. The effect of each cigarette lasts about 30 minutes. Already at 1 minute after firing, the SAT rises by 15 mm Hg. Art., and on the 4th - at 25 mm Hg. Art. At the same levels of blood pressure, stroke and coronary heart disease in smokers occur 2-3 times more often than those who do not smoke.

• Psychosocial factors. Stress contributes to increased blood pressure. However, it is still not known whether long-term stress leads to a long-term increase in blood pressure.

• Socio-economic status. In countries with a developed economy, the feedback between the AT and the level of education, income and professional status is determined. At the same time, in countries of transitional and pre-transitional period, the prevalence of hypertension among the well-to-do population is determined. The experience of most countries suggests that with the growth of the economy in society, the steady increase in blood pressure and prevalence of hypertension among the low-income groups of the population is recorded.

• Physical activity. In people who have a sedentary lifestyle, the risk of hypertension is 20-50% higher than that of physically active. Physical stress during the performance of professional duties contributes to the increase of blood pressure, and physical activity during leisure hours - on the contrary. Regular

aerobic exercise is a very effective means of non-medicated treatment for hypertension.

Preventive measures for arterial hypertension are aimed at introducing a healthy lifestyle and correcting identified risk factors. They include:

• restriction of the use of kitchen salt;

• weight reduction of the body with its excess;

• restrictions on the use of alcoholic beverages;

• reducing the consumption of saturated fats, sweets and cholesterol;

• smoking cessation;

• increase of physical activity during leisure hours;

• psycho-emotional unloading and relaxation.

According to WHO, lifestyle prevention is a universal "vaccine" against arterial hypertension, and the use of these measures reduces its new cases by 50%.

Basic examination should be performed by all patients with elevated blood pressure to determine the genesis of hypertension (primary or secondary), assessment of the status of target organs and risk factors. It consists of:

1) anamnesis, 2) physical examination, 3) laboratory-instrumental examination:

- measurement of blood pressure on both hands;

- measurement of blood pressure on the legs;

- auscultation of the heart, neck vessels, projection points of the renal arteries;

- general blood test;

- urinalysis general;

- the level of creatinine in the blood plasma with creatinine clearance or glomerular filtration rate;

- the level of potassium and sodium in the blood plasma;

- blood sugar level;

- the level of cholesterol and triglycerides in blood plasma;

- registration of an electrocardiogram;

- ophthalmoscopy of the fundus;

- ultrasound examination of the heart and kidneys.

Recommended tests:

- Dopplerography of carotid arteries

- Protein in urine (per day)
- Tibia-shoulder index of AT
- Glucose tolerance test
- Ambulatory monitoring of blood pressure
- Pulse wave speed

NON-MEDICINAL THERAPY

It is aimed at:

- weight loss in the presence of obesity;
- reduction of alcohol consumption;
- regular performance of dynamic physical exercises;
- restriction of consumption of kitchen salt to 5.0 g per day (1/2 teaspoons of salt spoon);
- Sufficient consumption of potassium, calcium and magnesium;
- reduced consumption of saturated fats and cholesterol;
- refusal of smoking.

Non-medicated treatment is also called lifestyle modification, because its basis is elimination of bad habits (smoking, excessive use of alcohol), increase of physical activity, restriction of salt in food, etc.

MEDICAMENTOUS THERAPY

First-line drugs:

- diuretics
- ACE inhibitors
- Calcium antagonists of prolonged duration
- antagonists of angiotensin II receptors
- beta-blockers

First-line drugs when applied in equivalent doses lead to the same reduction in blood pressure and a significant reduction in the risk of cardiovascular complications.

Drugs of the second line:

- alpha1-adrenoblockers
- Rauwolfia alkaloids
- central α2 agonists (clonidine, guanfacin, methyldopa)
- agonists of imidazoline receptors (moxonidine)
- direct inhibitors of renin (aliskiren)

Evidence of an effective reduction in the risk of cardiovascular disease in the use of drugs in the second line is much lower compared with first-line drugs.

HYPERTENSIVE CRISES

Hypertensive crisis is a sudden significant increase in blood pressure from a normal or elevated level, which is almost always accompanied by the appearance or intensification of disorders from the target organs or the autonomic nervous system.

Depending on the presence or absence of damage to target organs and the need for urgent reduction of blood pressure, isolate:

• complicated crises (with acute or progressive lesions of the target organs, constitute a direct threat to the life of the patient, requiring an immediate, within one hour, reduction of blood pressure);

• Uncomplicated crises (without acute or progressive defeat of the target organs, pose a potential threat to the life of the patient, need rapid - within a few hours - decrease in blood pressure).

Drugs for hypertensive crisis:

- IV:
  Nitripruside 0.25-10 μg/kg/min
  Labetalol 20-80 mg IVB q 10 min or 0.5-2 mg/min
  Fenoldopam 0.1-1.6 μg/kg/min
  Nicardipine 5-15 mg/h
  Phentolamine 5-15 mg bolus q 5-15 min
  Nitroglycerin 5-1000 μg/min
  Esmolol 0.5mg/kg/load – 0.05-0.2 mg/kg/min
  Hydralazine 10-20 mg q 20-30 min
  Clevidipine 1-16 mg/h
  Enalaprilat 1.25 mg
- **PO:**
  Captopril 12.5-100 mg tid
  Clonidine 0.2 mg/load → 0.1 mg qh
  Labetalol 200-800 mg tid
  Hydralazine 10-75 mg qid [13].

CHEST PAIN

Causes:

- Cardiac (ACS, myocarditis, pericarditis, aortic dissection)
- Pulmonary (pneumonia, pleuritis, pneumothorax, pulmonary embolism, pulmonary hypertension)
- Gastrointestinal (esophageal reflux, esophagospasm, Mallory-Weiss, peptic ulcer disease, biliary disease, pancreatitis)
- Musculoskeletal and miscellaneous (costocondr., zoster, anxiety)

Initial approach:

- **Focused history**: quality & severity of pain; location & radiation; provoking & palliating factors; intensity at onset; duration, frequency & pattern; setting in which it occurred; associated symptom; cardiac history and risk factors.
- **Targeted exam**: vital signs (including BP in both arms), cardiac gallops, murmurs or rubs; signs of vascular disease (carotid or femoral bruits, ↓ pulses), signs of heart failure; lung & abdominal exam; chest wall exam for reproducibility of pain [12].
- **Laboratory research**

The minimum list of biochemical parameters in the initial examination of a patient with suspected coronary heart disease and angina pectoris involves the determination of blood levels: total cholesterol level; HDL cholesterol, LDL cholesterol, TG, hemoglobin, glucose, AST, ALT.

- **Instrumental diagnostics**

The main instrumental methods for diagnosing the CC are ECG, veloergometry, echocardiography, coronary angiography; perfusion scintigraphy and single-photon emission tomography of the myocardium are also used.

- **Electrocardiography**

One of the most important methods for diagnosing myocardial ischemia with angina is ECG. The ECG, taken during the painful episode, is especially valuable. Unfortunately, this happens rarely, mainly in the case of inpatient observation. During myocardial ischemia, the ECG changes the end portion of the ventricular complex - the segment ST and the tooth T. The acute ischaemia usually results in a transient horizontal or oblique lowering of the ST segment and flattening or inversion of the T wave. Sometimes, the ST segment elevation is noted, which indicates a more severe transmural myocardial ischemia. Unlike acute MI, with angina, all deviations of the ST segment are rapidly normalized after the symptoms

are stopped. If the ECG is recorded outside the ischemic episode, it may be normal or have "non-specific" changes in the ST segment and the T wave. Symptoms of the transferred MI - pathological Q tines also indicate the presence of a coronary heart disease. However, pathological Q can occur in pulmonary thromboembolism, pronounced LHZ and HPL, hypertrophic cardiomyopathy, blockage of the branches of the left leg of the Hiss bundle, tumors and heart injuries.

• **Cardiac biomarkers (**troponin ± creatine kinase -MB**)**: troponin at baseline & 3–6 h after symptom onset **troponin**: >95% sensivity (Se), 90% specificity (Sp); level >99th% ile with rise & fall in appropriate setting is diagnosis of MI detectable 1–6 h after injury, peaks 24 h, may remain elevated for 7–10 d in STEMI *high-sens*.troponin: 98% Se, 90% Sp within 3 h of admit, 90% Se within 1 h.

Creatine kinase-MB: less Se &Sp (skeletal muscle, tongue, diaphragm, intestine, uterus, prostate), useful for diagnosis of post-percutaneous coronary intervention /coronary artery bypass grafting MI or MI if troponin already elevated [11].

• **Chest radiograph**; other imaging (echo, pulmonary embolism CT angiogram) as indicated.

• If low probability of ACS (eg, ECG &troponin) & stable → noninvasive functional or imaging test

• Coronary CT angio (CCTA): NPV 98% for significant CAD, but positive predictive value 35% for ACS; helpful to rule out CAD if low-intermediate probability of ACS. CCTA vs. noninvasive functional test for ischemia → ↓ time to diagnosis, but ↑ probability of catheterized percutaneous coronary intervention, contrast exposure & ↑ radiation. “Triple r/o” CT angiogram for CAD, PE, AoD. [12].

Physical exercise tests. An electrocardiogram, registered at rest, out of a painful attack, in a patient without a history of a MI, may turn out to be normal. During a FN test, the patient performs an increased workload on the treadmill or bicycle ergometer, while the heart rate and ECG are continuously recorded, and the blood pressure is monitored at regular intervals (1-3 minutes).

Basic indications for conducting load tests:

· Differential diagnostics of the coronary heart disease and its separate forms;

· Determination of individual tolerance to FN in patients with a diagnosis of coronary heart disease and clarification of angina pectoris;

· Assessment of the effectiveness of therapeutic, including surgical and rehabilitation measures;
· Examination of the working capacity of patients with CVD;
· Estimation of the forecast;
· Evaluation of the effectiveness of antianginal drugs.

Absolute contraindications to a test with FE are the acute phase of the MI (within 2-7 days from the beginning), unstable angina, cerebrovascular accident, acute thrombophlebitis, pulmonary embolism, CH III-IV Fc according to the classification of the New York Heart Association (NYHA)), severe pulmonary insufficiency, fever. It is inappropriate to perform a diagnostic test for tachyarrhythmias, complete blockage of the left leg of the Hyza bundle, high degrees of sinato-arrhythmia and atrioventocular blockade.

The test with FE is performed prior to the development of a stenocardia attack, the appearance of signs of myocardial ischemia on the ECG, the achievement of the target heart rate, the development of pronounced fatigue, making it impossible to prolong the FN, and the patient's failure to carry out the test. The FN test should be stopped at:
· Development of a typical stenocardia attack;
· Occurrence of life-threatening cardiac arrhythmias: frequent, or polythytic, or volley ventricular extrasystoles, paroxysmal tachycardia or paroxysmal atrial fibrillation;
• A pronounced shortness of breath (more than 30 breaths per minute) or an asthma attack;
· Development of conduction disturbances - blockade of the legs of the Hiss bundle, atrioventricular blockade of 2 degrees and more;
· Ischemic ST segment shift upwards> 1 mm in any of the leads except V1-2, where the lift is considered to be 2 mm or more, or down from the isoelectric line> 1 mm and lasts 80 ms from the point J, the slow transverse decrease of the ST segment at the point J + 80 msec> 2 mm (fast transient reduction of ST for ischemic is not accepted);
· Elevation of SBP> 220 mmHg, DBP> 110 mm Hg, reduction of SBP by 20 mm Hg;
· The appearance of neurological symptoms - dizziness, disturbance in the coordination of movements, severe headache;

· Intense leg pain;

· Development of a sharp tiredness of the patient, his refusal from further performance of the sample;

· As much precaution as the doctor decides;

· Reaching 75% of maximum age of heart rate.

Following the above criteria, the sensitivity of the test with FE to detect patients with an anatomically significant coronary artery disease, i.e. with a narrowing> 50%, is 65-80%, and specificity - 65-75%. Patients with positive test results are more likely to have a severe damage to several coronary arteries. A FN test is considered positive in the diagnosis of coronary heart disease if it reproduces typical pains or chest tightness in the patient and there are characteristic changes for ischemia on the ECG. Not always accompanied by a decrease in the segment of ST, the test is considered positive if the reduction does not appear pain, or if a typical attack of the angina develops without reducing the segment of ST.

Daily monitoring of the ECG. To detect changes in the ECG during episodes of chest pain it is advisable to conduct HM (Holter). The method allows to detect patients with coronary heart disease with asymptomatic course of the disease, i.e. fix myocardial ischemia without attacks of angina, or document the clinical signs of myocardial ischemia by specific changes in the ultimate part of the ventricular complex.. If the total length of ST segment decrease reaches 60 minutes, then this can be regarded as one of the indications for surgical treatment.

Coronary angiography. KAG - a method for diagnosing the state of the coronary bed. Despite the intensive development of noninvasive research methods, KAG makes it possible to choose the most objective way of treating: medication or revascularization of the myocardium.

The degree of narrowing of the vessel is determined by a decrease in the diameter of its lumen compared with the proper and expressed in%. To date, a visual assessment has been used with the following characteristics: normal coronary artery, altered artery contour without determining the degree of stenosis, narrowing <50%, narrowing by 51-75%, 76-95%, 95-99% (subtotal), 100% (occlusion) The narrowing of the artery> 50% is considered essential. Hemodynamically insignificant is the narrowing of the lumen of the vessel <50%.

ELECTROCARDIOGRAPHY

Approach (*a systematic approach is vital*)

• **Rate** (tachy, brady) and **rhythm** (relationship between P and QRS)
• **Intervals** (PR, QRS, QT) and **axis** (LAD or RAD)
• **Chamber abnormality** (LAA and/or RAA, LVH and/or RVH)
• **QRST changes** (Q waves, poor R-wave progression V1–V6, ST ↑/↓ or T-wave Δs)

Left axis deviation (LAD)

• **Definition**: axis beyond –30° (S > R in lead II)
• **Etiologies**: LVH, LBBB, inferior MI, WPW
• **Left anterior fascicular block**: LAD (–45 to –90°) *and* qR in aVL*and* QRS <120 msec*and* no other cause of LAD (eg, IMI)

Right axis deviation (RAD)

• **Definition**: axis beyond +90° (S > R in lead I)
• **Etiologies**: RVH, PE, COPD (usually not > +110°), septal defects, lateral MI, WPW
• **Left posterior fascicular block**: RAD (90–180°) *and* rS in I &aVL*and* qR in III &aVF*and* QRS <120 msec*and* no other cause of RAD [17].

Prolonged QT interval

• QT measured from beginning of QRS complex to end of T wave (measure longest QT)
• QT varies w/ HR → correct w/ Bazett formula: QTc = QT/√RR (in sec), formula inaccurate at very high and low HR (nlQTc<440 msec and <460 msec)
• QT prolongation a/w ↑ risk TdP (esp. >500 msec); perform baseline/serial ECGs if using QT prolonging meds, no estab guidelines for stopping Rx if QT prolongs
• **Etiologies:**

- **Antiarrhythmics**: class Ia (procainamide, disopyramide), class III (amiodarone, sotalol)
- **Psych drugs**: antipsychotics (phenothiazines, haloperidol, atypicals), Li, SSRI, TCA
- **Antimicrobials**: macrolides, quinolones, azoles, pentamidine, atovaquone, atazanavir
- **Other**: antiemetics (droperidol, 5-HT3 antagonists), alfuzosin, methadone, ranolazine
- **Electrolyte disturbances**: hypoCa (nb, hyperCaa/w ↓ QT), hypoK, hypoMg

- **Autonomic dysfxn**: ICH (deep TWI), stroke, carotid endarterectomy, neck dissection
- **Congenital** (long QT syndrome): K, Na, Ca channelopathies
- **Misc**: CAD, CMP, bradycardia, high-grade AVB, hypothyroidism, hypothermia, BBB [12].

Left ventricular hypertrophy (LVH)

• Etiologies: HTN, AS/AI, HCMP, coarctation of aorta

• Criteria (all w/ Se <50%, Sp>85%; accuracy affected by age, sex, race, BMI):

- Romhilt-Estes point-score system: 4 points = probable, 5 points = definite ↑ Amplitude (any of the following): largest R or S in limb leads
- ≥20 mm *or* S in V1 or V2 ≥30 mm *or* R in V5 or V6 ≥30 mm (3 points)
- ST displacement opposite to QRS deflection: w/o dig (3 points); w/ dig (1 point)
- LAA (3 points); LAD (2 points); QRS duration ≥90 msec (1 point)
- Intrinsicoid deflection (QRS onset to peak of R) in V5 or V6 ≥50 msec (1 point)
- Sokolow-Lyon: S in V1 + R in V5 or V6 ≥35 mm or R in aVL ≥11 mm
- Cornell: R in aVL + S in V3 >28 mm in men or >20 mm in women
- If LAD/LAFB, S in III + max (R+S) in precordium ≥30 mm [11].

Right ventricular hypertrophy (RVH)

• Etiologies: corpulmonale, congenital (tetralogy, TGA, PS, ASD, VSD), MS, TR

• Criteria (all tend to be insensitive, but highly specific, except in COPD):

- R > S in V1 or R in V1 ≥7 mm, S in V5 or V6 ≥7 mm, drop in R/S ratio across precordium
- RAD ≥ +110° (LVH + RAD *or* prominent S in V5 or V6 → *biventricular* hypertrophy

Differentiation diagnosis of dominant R wave in V1 or V2

• Ventricular enlargement: RVH (RAD, RAA, deep S waves in I, V5, V6); HCMP

• Myocardial injury: posterior MI (anterior Rw = posterior Qw; often with IMI)

• Abnormal depolarization: RBBB (QRS >120 msec, rSR′); WPW (↓ PR, Δ wave, ↑ QRS)

• Other: dextroversion; Duchenne muscular dystrophy; lead misplacement; nl variant

Poor R wave progression (PRWP)

• Definition: loss of anterior forces w/o frank Q waves (V1–V3); R wave in V3 ≤3 mm

• Possible etiologies (nonspecific):

- old anteroseptal MI (usually w/ R wave V3 ≤1.5 mm, ± persistent ST ↑ or TWI V2 & V3) cardiomyopathy
- LVH (delayed RWP with prominent left precordial voltage), RVH, COPD (which may also have RAA, RAD, limb lead QRS amplitude ≤5,
- SISIISIII w/ R/S ratio <1 in those leads)
- LBBB; WPW; clockwise rotation of the heart; lead misplacement; PTX [12].

Pathologic Q waves

• Definition: ≥30 msec (≥20 msec V2–V3) or >25% height of R wave in that QRS complex

• Small (septal) q waves in I, aVL, V5 & V6 are nl, as can be isolated Qw in III, aVR, V1

• "Pseudoinfarct" pattern may be seen in LBBB, infiltrative dis., HCMP, COPD, PTX, WPW

ST elevation (STE):

• **Acute MI** (upward convexity ± TWI) or prior MI with persistent STE

• **Coronary spasm** (Prinzmetal's angina; transient STE in a coronary distribution)

• **Myopericarditis**(diffuse, upward concavity STE; a/w PR ↓; Tw usually upright)

• **HCMP**, **Takotsubo CMP**, **ventricular aneurysm**, cardiac contusion

• **Pulmonary embolism** (occ. STE V1–V3; typically associated TWI V1–V4, RAD, RBBB)

• **Repolarization abnormalities:**

- LBBB (↑ QRS duration, STE discordant from QRS complex)
- dx of STEMI in setting of LBBB: ≥1 mm STE concordant w/ QRS (Se 73%, Sp 92%), STD ≥1 mm V1–V3 (Se 25%, Sp 96%) or STE ≥5
- mm discordant w/ QRS (Se 31%, Sp 92%) ("Sgarbossa criteria")
- LVH (↑ QRS amplitude); Brugada syndrome (rSR′, downsloping STE V1–V2)
- Hyperkalemia (↑ QRS duration, tall Ts, no Ps) [17].

• **aVR**: STE >1 mm a/w ↑ mort in STEMI; STE aVR> V1 a/w left main disease

• **Early repolarization**: most often seen in V2–V5 & in young adults

- J point ↑ 1–4 mm; notch in downstroke of R wave; upward concavity of ST; large Tw;
- ratio of STE / T wave amplitude <25%; pattern may disappear with exercise
- early repol in inf leads may be a/w ↑ risk of VF

ST depression (STD)

• **Myocardial ischemia** (± Tw abnl) or acute true posterior MI (V1–V3)

• Digitalis effect (downsloping ST ± Tw abnl, does *not* correlate w/ dig levels)

• Hypokalemia (± U wave)

• Repolarization abnl in a/w LBBB or LVH (usually in leads V5, V6, I, aVL)

T wave inversion (TWI; generally ≥1 mm; deep if ≥5 mm)

• Ischemia or infarct; Wellens' sign (deep early precordial TWI) → proximal LCA lesion

• Myopericarditis; CMP (Takotsubo, ARVC, apical HCM); MVP; PE (esp. if TWI V1–V4)

• Repolarization abnl in a/w LVH/RVH ("strain pattern"), BBB

• Posttachycardia or postpacing

• Electrolyte, digoxin, PaO2, PaCO2, pH or core temperature disturbances

• Intracranial bleed ("cerebral T waves," usually w/ ↑ QT) [17].

• Normal variant in children (V1–V4) and leads in which QRS complex predominantly

Low voltage

• QRS amplitude (R + S) <5 mm in all limb leads &<10 mm in all precordial leads

• Etiologies: COPD (precordial leads only), pericardial effusion, myxedema, obesity, pleural effusion, restrictive or infiltrative CMP, diffuse CAD [11].

HEART FAILURE

Definition

Heart failure is defined as the inability of the heart to pump blood volume needed to meet the metabolic needs of the body ("systolic dysfunction") or the ability to provide these needs only due to an abnormally high cardiac pressure ("diastolic dysfunction"), or due to both of these mechanisms.

Cardiac insufficiency can be the main manifestation of virtually all heart disease, including coronary artery atherosclerosis, myocardial infarction, acquired heart valve defects, congenital heart defects, arrhythmias, and cardiomyopathy.

Depending on the decrease in the functional capacity of a particular ventricle of the heart, they distinguish:

- Left ventricular failure;
- Right ventricular failure;
- Biventricular insufficiency (decreased contractility of both ventricles of the heart).

Clinical signs:

✔ The most pronounced symptom of chronic left ventricular insufficiency is shortness of breath under load, which is associated with venous congestion in the lungs or low cardiac output. As the disease progresses, shortness of breath can also be observed in rest.

✔ Often, heart failure is accompanied by orthopnea, nocturnal heart attacks and night coughing. Orthopnea is a difficulty in breathing in the lying position and decreases in a sedentary position. The reason for this symptom is redistribution of blood from the organs of the abdominal cavity and lower extremities to the lungs in the lying position. In some cases, orthopnea is so pronounced that the patient is forced to sleep in a sitting position.

✔ Nocturnal heart attacks - These are severe breaths during nighttime sleep. This symptom is observed in the lying position when the fluid penetrates into the blood from the swelling of the lower extremities, which leads to an increase in the volume of circulating blood and venous return in the heart and lungs.

✔ Night cough - also a symptom of blood clots in the lungs, its mechanism of development is identical to the mechanism of development of orthopnea. In some cases, hemoptysis may occur, which is due to the breakdown of the bronchi's veins due to their fullness.

✔ Typical manifestations of heart failure include confusion and a decrease in daytime diuresis, due to reduced blood supply to the brain and kidneys, respectively. Sometimes night diuresis may be intensified, as in the lying position, blood supply to the kidneys improves. It is also characterized by general weakness and rapid fatigue, due to insufficient blood supply to the skeletal muscle.

✔ Patients with isolated right ventricular insufficiency, often experience a sense of discomfort in the right hypochondrium, which is due to excessive blood flow of the liver and stretching of its capsule. In severe cases, the accumulation of fluid in the

abdominal cavity (ascites) may occur. Also, a characteristic symptom is the development of peripheral edema, especially on the ankles. If the patient for a long time was in an upright position, then such swelling will intensify by the end of the day, disappearing this morning.

To assess the severity of heart failure, the New York Cardiology Association (NYHA) classification is often used:

Class I - Physical activity is not limited

Class II - Easy activity limitation. Appearance of shortness of breath and weakness after moderate physical activity

Class III - Expression of activity limitation. Smell after a minimum exercise

Class IV - Severe activity limitation. Symptoms of heart failure at rest

Diagnosis of heart failure can not be based on the evaluation of clinical symptoms and signs, of which none is sufficiently sensitive and specific for CHF. For the diagnosis of CHF, objective evidence of serious heart failure and cardiac muscle dysfunction is required, which, as a rule, can not be obtained without the use of instrumental research methods.

The clinical response to heart failure therapy (symptomatic improvement after administration, for example, diuretics and nitrates) is not sufficient in itself to diagnose heart failure, however, it is observed in most patients with CHF. When suspected of heart failure, diuretics are usually used as trial therapy. Thus, the expressed diuretic effect after taking 20-40 mg of furosemide and a noticeable decrease in dyspnea and / or edema suggest in favor of the diagnosis of CHF. B-adrenoblockers and nitrates are also used to clarify the origin of dyspnea (with suspicion that shortness of breath is the equivalent of angina pectoris), b2-sympathomimetics (in case of suspicion of obstructive pulmonary disease), corticosteroids (in case of suspected allergic alveolitis) and antibiotics (if suspected of pulmonary infection).

Among the instrumental methods for diagnosis of CHF most commonly are electrocardiography, chest x-ray and echocardiography. The purpose of instrumental diagnostics is to obtain objective evidence of the presence of heart dysfunction in a patient suspected of having CHF.

Principles of medical treatment of heart failure

Treatment for heart failure should be aimed at achieving the following goals:

- Identification and treatment of the underlying disease leading to the development of heart failure. For example, in some cases intensive antihypertensive therapy, valve prosthetics or complete refusal to use alcohol, etc. may be required.
- Elimination of factors provoking development of decompensation in patients with compensated heart failure (for example, adequate treatment of arrhythmias, restriction of drinking liquid or consumption of cooked salt).
- Treatment for decompensation of heart failure:
- Reduced blood stagnation: (limitation of salt intake, restriction of fluid intake, medical therapy (diuretics), aimed at eliminating excess water and sodium from the body.
- Increased cardiac output and improved blood supply to vital organs. To this end, inotropic drugs are used which increase the contractility of the heart muscle, as well as various vasodilators.

ISCHEMIC STROKE

A stroke is a clinical syndrome of rapid development of signs of focal or global loss of brain function that lasts 24 hours or more, or leads to death in the absence of other (non-vascular) causes.

The main risk factor for stroke is arterial hypertension (an increase in blood pressure of 200/100 mm Hg doubles the risk of developing cardiovascular complications).

Etiologies

• Embolic (~75%): artery → artery, cardioembolic, paradoxical, cryptogenic

• Thrombotic (~25%): large vessel (atherosclerosis) vs. small vessel (“lacunar,” lipohyalinosis of small arteries, often related to HTN, hyperlipidemia,& DM)

• Other: dissection, vasculitis, vasospasm, prothrombotic states, hypoperfusion, genetic

Clinical Manifestations: Clinical picture of ischemic stroke is presented by symptoms of sudden loss of function of a certain department of the brain. They are determined by the department of the brain, which is affected by ischemia, the volume of damage. In most cases, symptoms that occur in patients are speech impairment, motor and sensory functions, and vision on one side.

- Motor disturbances

Weakness or awkwardness of movements on one side of the body, full or partial (hemiparesis). Simultaneous bilateral development of limb weakness (paraparesis, tetraparesis). Swallowing disorders (dysphagia). Disturbances of coordination (ataxia).

- Violations of speech

Violations of understanding or using speech (aphasia). Violations of reading (alexia) and letters (engraving). Account Violations (akalkuly). Lubrication of speech (dysarthria).

- Sensitive violations

Somatosensory changes in sensitivity on one side of the body, full or partial (hemigipasty). Visually impaired - vision reduction on one eye, full or partial (transient monocular blindness). Occurrence of the right or left half (or quadrant) of the field of view (hemiaopsis, quadrant hemianopsia). Bilateral blindness. Twin before the eyes (diplopia).

- Vestibular

The feeling of rotation of objects (systemic dizziness).

- Violations of behavior and cognitive functions

It's hard to dress, brush, brush your teeth, etc .; violation of orientation in space; disturbance of copying of drawings, for example, hours, flowers or intersecting cubes (disturbances of visual-spatial perception). Memory impairments (amnesia).

Examination measures for all patients with a stroke:

- Clinical blood test
- Blood glucose, urea and blood electrolytes
- Blood plasma cholesterol level
- 12-channel electrocardiography
- Emergency CT (CT) of the brain for: - differential diagnosis of hemorrhagic stroke and cerebral infarction (CT should be performed within a few hours after a stroke)

Patients who have an etiology of stroke remain uncertain or who may be suspected of being suspected based on survey data or simple survey methods, are more specialized studies:

- Ultrasound duplex scan
- Cerebral angiography

- Magnetic-dispersive angiography (MRA) and intraarterial digital subtraction angiography
- Transthoracic echo-cardiography (TT-ECHO-CG)
- Magnetic resonance imaging

Treatment of patients with ischemic stroke includes:

I. Basic therapy (including intensive care of patients in critical condition), which includes:

1. Support the respiratory function and respiratory protection.
2. Support for cardiovascular function.
3. Correction of blood pressure.
4. Infusion therapy.
5. Correction of glucose level.
6. Correction of body temperature.

II Specific (differentiated) pharmacotherapy, which includes:

1. Thrombolytic therapy.
2. Antiplatelet therapy.
3. Treatment of cerebral edema and correction of VHT (medication therapy, surgical decompression).

III Surgical treatment of ischemic stroke

IV. Treatment of complications:

1. Somatic;
2. Neurological.

INTRACRANIAL HEMORRHAGE (ICH)

A haemorrhagic stroke is an emergency and requires the provision of emergency medical care and urgent hospitalization to a health care facility that provides secondary medical care or tertiary care, which may undergo neurosurgical treatment as soon as possible from the onset of the disease.

The leading **etiological factors** of hemorrhagic stroke include:

- hypertonic disease;
- symptomatic arterial hypertension (due to the following reasons: vasorenal; diseases of the endocrine system; diseases of the heart, aorta and large vessels);
- arterial cerebral aneurysms, congenital vascular malformations (arterio-venous malformations, cavernosum angiomas)

- systemic vascular processes of infectious-allergic nature (hemorrhagic diathesis, vasculitis);
- blood diseases (leukemia, disease of Verlhof);
- cerebral amyloid angiopathy;
- application of anticoagulants, antiaggregates

Clinical manifestations

Prodromal symptoms are practically absent, occasionally there are nonspecific manifestations - headache, anxiety, dizziness, noise in the ears, etc.
Typical for most hemorrhages, there is a acute onstart with a very strong headache. Following this, oppression of consciousness develops, vomiting, coarse withdrawal symptoms, meningeal symptoms often join. In deep coma, meningeal symptoms may be absent. In semi-layered hemorrhages, seizures may occur.

Diagnostic measures:

In order to clarify the diagnosis in case of suspicion of subarachnoid hemorrhage, a lumbar puncture in the patient's position is lying on the side with legs stretched to the stomach in a few hours. The liquid (3-10 ml) should be released carefully, preventing its rapid drainage with mandrel. In intracranial, in particular, in subarachnoid, hemorrhage, cerebrospinal fluid flows under high pressure, it is bloody. To exclude the presence of a random "travel" blood in it, the cerebrospinal fluid is collected in small portions in different tubes. In the case of a wound of a needle of epidural veins, in each subsequent test tube it is more and more shining, whereas in case of subarachnoid hemorrhage, the color of it in all about the tags will be uniform.

The obtained fluid needs to be centrifuged, and in the cases of intracranial hemorrhage, the liquid over the precipitate from the blood cells is xanthromous. From the third day, neutrophilic pleocytosis is detected in it. From the 5-6th day, the number of lymphocytes and mononuclear cells increases. Subarachnoid hemorrhages at the aneurysms of the vessels of the brain may recur.

Data from laboratory and functional studies. With hemorrhagic stroke, ophthalmoscopy sometimes reveals hemorrhages in the retina of the eyes, signs of hypertonic retinopathy. In the study of cerebrospinal fluid, an admixture of blood is detected. When angiography, it is possible to detect an intracerebral vascular displacement or the presence of the so-called vascular zone, aneurysms of the cerebral vessels. Computer and magnetic resonance imaging can visualize the

presence in the cavity of the skull of a characteristic hemorrhagic focal area of increased density of tissues already in the acute stage of hemorrhagic stroke. In this case, it is possible to determine the localization and size of the hematoma.

Treatment tactics

Hypotensive drugs:

- Selective beta-blockers (Atenolol, Metoprolol, Betaxolol, Bisoprolol, Nebivolol, Esmolol, Acebutolol);
- Non-selective beta-blockers (Anaprilin, Nadolol, Sotalol, Timolol, Oksprenolol, Pindolol, Penbutolol);
- Mixed beta-blockers (Carvedilol, Labetalol).

Calcium antagonists:

- The first generation (Isoptin, Finoptin, Phenigidin, Adalat, Corinth, Kordafen, Cordypin, Diaz, Diltyazem);
- Second generation (Gallopamil, Anipamil, Falipamil, Isradipin / Lomir, Amlodipine / Norvask, Felodipine / Plandil, Nitrendipine / Ottidipine, Nimodipine / Nimotop, Niccardipine, Lacidipine / Lacipil, Riodipine / Foridon);
- Third generation (Klentiazem).

Spasmolytics:

- Direct action (Papaverine, No-sp, Drotaverine, Nitroglycerine, Otilony bromide, Mebeverin, Halydor, Gimecromon);
- Mediated action (Approfen, Ganglifen, Atropin, Diphacillus, Buscopan).

ACE inhibitors (angiotensin converting enzyme):

- Sulfhydryl group (Benazepril, Captopril, Zohenopril);
- Carboxyl group (Cilazapril, Enalapril, Lisinopril, Perindopril, Quinapril, Ramipril, Spirapril, Trandolapril);
- Phosphinyl group (Phosinopril).

LIPID DISORDERS

Dyslipidemia is an exclusively laboratory parameter detected by a special blood test - a lipidogram.

Clinical manifestations of dyslipidemia:

- xanthomas - dense nodules containing cholesterol, over the tendons of the patient (dense structures that attach the muscles to the bones), for example,

on the brush. Rarely, xanthomas can appear on the soles of the legs, palms, skin of any part of the body, especially the back;

- xanthelasms - deposition of cholesterol under the skin of the eyelids in the form of flat nodules of yellow color or nodules, not differing in color from other parts of the skin;
- The lipoid arc of the cornea is a white or grayish-white rim of the deposited cholesterol along the edges of the cornea of the eye. The appearance of a lipoid arc of the cornea under the age of 50 indicates the presence of hereditary dyslipidemia.
- The symptoms of organ damage appear in the development of atherosclerosis as a result of dyslipidemia.

Classification by Fredrickson depending on the type of elevated lipid in the blood:

- 1 type of dyslipidemia is hereditary hyperchilomyconemia: only chylomicrons (large lipoproteins containing 9/10 triglycerides and 1/10 - cholesterol) are elevated in the blood. The only type of dyslipidaemia whose ability to cause atherosclerosis is not proven;
- 2a type of dyslipidemia - hereditary hypercholesterolemia, polygenic (due to both hereditary factors and the influence of the external environment) hypercholesterolemia: in the blood lipoproteins of low density are elevated;
- 2b type of dyslipidemia - combined hyperlipidemia: low and very low density lipoprotein and triglycerides are elevated in the blood;
- Type 3 of dyslipidemia is hereditary dis-beta-lipoproteinemia: low density lipoprotein in the blood;
- 4 type of dyslipidemia - endogenous hyperlipidemia: high levels of lipoprotein in the blood are very low density;
- 5 type of dyslipidemia is hereditary hypertriglyceridemia: in the blood, high density lipoprotein and chylomicrons are elevated in the blood.

Measurements

Study of serum lipid profile (total cholesterol, TG, HDL cholesterol, and LDL cholesterol and VLDL**).**

Evaluation of TC, TG and HDL by direct measurement. Levels of TS and TG reflect the content of cholesterol and TG in all blood lipoproteins, including chylomicrons, VLDL, lipoproteins of intermediate density, LDL and HDL. Even in the absence of violations of lipid metabolism, the levels of TC and TG on different

days can vary by 10 and 25%, respectively. TC and HDL cholesterol can be detected and not fasting, but the accuracy and reproducibility of the results is provided only by fasting (usually at 12-hour fasting).

The analyzes are carried out after the elimination of acute diseases, since at inflammation levels of TG and lipoprotein (a) increase, and cholesterol levels - decrease. During the 30 days after the MI, the lipid profile is unstable, but the results obtained in the first day after the MI, can usually be relied upon when considering indications for the appointment of hypolipidemic therapy.

The level of LDL cholesterol is most often calculated as the difference between OC and HDL cholesterol + VLDL. Concentration of cholesterol VLDL is calculated according to the formula: TG ÷ 5 level, since the concentration of cholesterol in VLDL is usually one fifth of the total lipid content in these particles. Thus:

$$LDL\ cholesterol = Total\ cholesterol - \left[HDL\ \ cholesterol\ + \left(\frac{Triglycerides}{5}\right)\right]$$

Treatment

- Detailed risk assessment according to existing criteria
- Changing lifestyle (eg, increased physical activity, diet modification)
- With high levels of LDL cholesterol: statins, sometimes sequestrants of bile acids, ezetimib, niacin, and the like.
- At high levels TG: niacin, fibrates, omega-3 fatty acids, in some cases other drugs

ANEMIA: Anemia is a condition of a human body characterized by a reduced concentration of hemoglobin per unit volume of blood, and is usually correlated with a simultaneous decrease in the number of red blood cells. The diagnostic criterion for anemia in men is to lower the hemoglobin concentration in the blood to a level below 130 g / l ,for women – lower than 120 g / l.

Clinical manifestations

The symptoms of anemic syndrome include:

- general malaise, chronic fatigue;
- weakness, inability to tolerate prolonged physical and mental stresses;
- attention deficit disorder, difficulty with concentration, rigidity;
- irritability;

- headaches
- dizziness, sometimes fainting;
- drowsiness and sleep disorders;
- shortness of breath, rapid pace of heartbeat, both in physical and / or psychoemotional stresses, and in resting conditions;
- black stool color (when bleeding gastrointestinal tract).

Sideropenic syndrome is characterized by the following manifestations:

- perversion of taste preferences, craving for eating chalk, clay, raw meat, etc .;
- distortion of smell, desire to sniff paint, household chemistry, substances with a sharp smell (acetone, gasoline, washing powder, etc.);
- brittleness, dryness of the hair, lack of shine;
- white patches on the nail plate;
- dry skin, peeling;
- pallor of the skin, sometimes - blue sclera;
- the presence of heilites (cracks) in the corners of the lips.

Diagnostics

- Analysis of anamnesis of the disease and complaints (when (as long ago) there was general weakness, shortness of breath, dizziness, sore pains in the chest and others, with which the patient binds the appearance of these symptoms).
- Analysis of the history of life. Whether there are any chronic diseases in the patient, whether the hereditary (transmitted from parents to children) of the disease are noted, whether the patient has bad habits, whether he took any drugs for a long time, whether he was diagnosed with a tumor, whether he contacted with toxic (poisonous) substances.
- Physical examination. The color of the skin is determined (paleness possible). The pulse may be accelerated, blood pressure lowered.
- Blood test. Reducing the number of red blood cells (red blood cells, the norm 4.0-5.5x109 g / l), decreasing the hemoglobin level (a special compound within the erythrocytes carrying oxygen, a norm of 130-160 g / l) can be determined. The color index (the ratio of the hemoglobin level multiplied by 3, to the first three digits of the number of red blood cells) may remain normal (normally this index is 0.86-1.05) or change in the

direction of increase or decrease. The number of leukocytes (white blood cells, the norm 4-9x109 g / l) may be normal, elevated or reduced. The number of platelets (blood platelets, the gluing of which ensures coagulation of the blood) remains normal, less frequently - reduced or elevated (norm 150-400x109g / l).

- Urine analysis Conducted to detect concomitant diseases.
- Biochemical analysis of blood. Determine the level of cholesterol (fat-like substance), glucose (simple carbohydrate), creatinine (protein degradation product), uric acid (the product of decomposition of substances from the cell nucleus), electrolytes (potassium, sodium, calcium) to detect concomitant diseases.
- Bone marrow examination obtained by means of a puncture (puncture with extraction of internal contents) of the bone, most often the sternum (the central bone of the anterior surface of the chest, to which the ribs are attached), is performed in some cases to assess the hematopoiesis and to identify the nature of anemia.
- Trepanobiopsy (bone marrow examination in its relation to surrounding tissues) is performed by taking a bone marrow column and bone marrow, usually from the ankle bone (the human pelvic region located closest to the skin), with the help of a special instrument, the trepane. The most accurately characterizes the state of the bone marrow.
- Electrocardiography (ECG). The increase in heart rate, heart failure, and rarely heart rate abnormalities are determined.

It is also possible to consult a hematologist.

Anemia treatment

- Impact on the cause of anemia
- Conservative methods
- Impact on the mechanism of development of anemia - for example, the appointment of iron products or vitamin B12 with their deficiency.
- Rapid replenishment of the amount of red blood cells (red blood cells) is the transfusion of red blood cells (red blood cells isolated from donor blood) or washed red blood cells (donor erythrocytes liberated from proteins attached to their surface, erosion of red blood cells reduces the frequency and

severity of negative reactions to their transfusion). Performed according to vital signs (that is, in the presence of a threat to the patient's life).

TESTS FOR FINAL CONTROL

1. 82 years old patient had circulatory arrest and respiratory standstill. Medical history: prolonged heart failure. On the 5th minute of cardiopulmonary resuscitation, which was started on time, there wasn’t the cardiac activity. What is the prognosis for further resuscitation?

A. Full restoration is impossible
B. Restoration of beatings with some extrasystoles
C. Full recovery
D. Full recovery with following deterioration
E. Possible restore of sinus rhythm

2. There was patient with atrial fibrillation, paroxysm of ventricular tachycardia. Which universal antiarrhythmic is most reasonable for patient?

A. Panangin
B. Procainamide hydrochloride
C. Lidocaine
D. Verapamil
E. Digoxin

3. On the fourth postoperational day the 68 years old patient had acute bradycardia with asystole, no consciousness, coarse breathing. Resuscitation was started. What is the criterion of effectiveness of resuscitation?

A. xerophthalmus
B. Appearance of breath
C. Reduction of cyanosis
D. The carotid pulsation
E. Myotic pupils

4. In-hospital 50 year old patient with arterial hypertension, ischemic heart disease suddenly fainted. Duty doctor diagnosed the circulatory arrest and respiratory standstill. The cardiopulmonary resuscitation was started. A set of false teeth was extracted. What will be the following actions?

A.Intracardiac injection of adrenalin

Intracardiac injection of atropine
Closed-chest massage
Proceed to ventilation
Throw back patient's head, lift chin, pull and fix tongue

5. Man was injured as a result of falling from a height. Physical examination: no response to natural irritants, unconscious, no breathing, thready pulse, left foot was unnatural turn to the other side, numerous wounds and scratches on skin. Which are primary measures in this case?

A. Applying of sterile bandages on wounds
B. Immobilization of fractures
C. Transfusion-infusion therapy
D. Respiratory restoration
E. Anesthesia

6. The 75-years-old man was unconscious in the street with no pulsation on main arteries, mydriatic pupils. The clinical death was diagnosed. Which are primary measures in this case?

A. emergency call
B. Start a closed-chest cardiac massage
C. Start the cardiopulmonary resuscitation
D. Elevate the lower limbs
E. Start artificial respiration

7. Resuscitation of elderly patient was not effective: wave of artificial carotid pulsation was not determined; the closed-chest cardiac massage was performed with displacement of the lower half of the sternum on 2-3 cm toward the spine because of chest stiffness. When the heart massage will be effective?

A. Increasing the displacement of sternum to 4-5 cm
B. Start the open-chest cardiac massage
C. Perform chest compression in left parasternal region
D. 10 ml 10% calcium chloride solution injection
E. Increasing displacement of sternum to 6-7 cm

8. The patient suddenly turned pale, unconscious. The skin was cyanotic, no photoreaction, no carotid pulsation, asystole on ECG. Which are primary measures in this case?

A. Precardiac blow
B. Artificial respiration
C. The closed-chest cardiac massage
D. Droperidol injection
E. Adrenaline injection

9. You perform the resuscitation measures for patient - closed-chest cardiac massage, mouth-to-mouth ventilation. Which will be duration of these actions in the absence of recovery of cardiac and central nervous system activity?

A. 45 minutes
B. Before the emergency arrival
C. 60 minutes
D. 30 minutes
E. 15 minutes

10. During diagnostic endoscopy the 45-years-old patient was asystole on ECG. Which will be your primary action?

A. Electrical cardiac acceleration
B. Sodium bicarbonate injection
C. Atropine injection
D. defibrillation.
E. closed-chest cardiac massage, artificial ventilation

Answers:

1	2	3	4	5	6	7	8	9	10
C	**B**	**C**	**E**	**C**	**C**	**A**	**B**	**D**	**E**

TASKS FOR FINAL CONTROL

Task 1. During a prophylactic medical examination of man without complaints, there were determined: moderate pale skin; cardiac border: rights - on the right edge of breastbone, overhead - overhead edge of III rib, left - 1 cm to the left from medioclavicularis line; muffled I heart sounds above an apex, accent of II heart

sounds in II intercostal left of breastbone; systolic murmur above an apex which was spred in the axillary area.

1.1. At X-Ray it is possible to see all signs, except:

A. to smooth out waist of heart

B. shadow of heart as "sabo" (wooden boot)

C. left ventricular hypertrophy

D. rejection of contrasting gullet on the arc of large radius in a lateral projection

E. to smooth out waist of heart and increase of the left ventricle

1.2. For the brought case over most characteristic will be:

A. increase of top limit of heart

B. murmur is accompanied by the systolic fremitus

C. pansystolic murmur above an apex

D. strengthening of systolic murmur on inhalation

E. murmur is accompanied by the diastolic fremitus

1.3. This clinical symptomatology most answers such defect of heart as:

A. inborn defect of heart

B. mitral stenosis

C. the combined mitral defect

D. aortic stenosis

E. insufficiency mitral valve

1.4. What complex of research must be executed first of all?

A. biochemical blood tests are for determination of activity of rheumatism

B. biochemical blood tests for determination of activity of rheumatism + of Echo-CG

C. of ECG + of Echo-CG

D. roentgenologic research of heart + of ECG + of Echo-CG

E. sounding of cavities of heart

1.5. What medical tactic you to enter to this patient?

A. to conduct a secondary prophylaxis

B. to appoint seasonal treatment

C. to recommend the surgical correction of defect of heart

D. only dynamic supervision

E. to appoint bycilin-5 one time in a month during one year

Task 2. Most characteristic clinical symptom of stable angina pectoris:

A. pain squeezing character

B. pain retrosternal
C. efficiency to nitroglycerine
D. broadened to irradiation pain
E. normal ECG during an attack and after the physical loading
F. vertigo

Task 3. For a patient 55 years, which carried myocardial infarction a few years ago, began to rise ABP to 160/100 mm hg. p. Heredity after high blood pressure is burdened. What hypotension drugs will you appoint, taking into account information of anamnesis?

A. β-adrenoblocker
B. diuretics
C. ACE inhibitors
D. direct action vasodilators
E. ACE inhibitors or β-adrenoblocker

Task 4. Basic difference IIA stages of heart failure on a left-sided type from one stages:

A. increased BP
B. emergence peripheral edema (transit)
C. tachycardia in rest
D. symptom to engorgement in the greater circulation
E. symptom to engorgement in the lesser circulation

Task 5. An indications for daily monitoring of BP:

A. differential diagnosis of arterial hypertension and hypertension “white coat”
B. hypotension diagnosis
C. valuing to character of arterial hypertension and influence of different factors
D. assessment of efficiency of therapy
E. all of mentioned above.

Task 6. Character of pain in the angina of effortis:

A. without precursors, sudden, on height of the physical loading, gradually grows to the peak of intensity in the form of crescendo
B. after auras

C. maximum intensity will attack at the beginning

D. pain grows undulating

E. in 4-6 hours after loading, maximum on 2-3 days

Task 7. A patient suffers long time for gout and essential hypertension was admitted to the hospital with the signs of polyarthritis and increase of BP to 170/100 mmHg. Which hypotensive drugs are contra-indicated in this case?

A. diuretics

B. calcium channel antagonist

C. ACE inhibitors

D. β-adrenoblocker

E. direct-acting vasodilators

Task 8. In the case of anemia a blood test was: erythrocytes - $3{,}0x10_{12}$/l, hemoglobin - 75 of gm/l, color index - 0,75, reticulocytes - 2%, leucocytes - $5{,}5x10^{9}$/l, platelets of $220x10^{9}$/l, eosinophil - 1%, neutrophilic - 64%, lymphocyte - 31%, monocyte - 4%, speed of precipitation of erythrocytes - a 30 mm/h, anisocytosis +++, hypochromic microcytosis?

A. hypoplastic

B. iron deficiency

C. megaloblastic

D. hemolytic

E. all of mentioned above

Answers:

1.1	1.2	1.3	1.4	1.5	2
B	**C**	**E**	**B**	**A**	**C**
3	4	5	6	7	8
E	**E**	**E**	**A**	**A**	**B**

TOPIC 5
THE ALGORHYTM OF FD IN THE CASE OF PULMONARY AND UROGENITAL DISEASES.THE PEAKFLOWMETRY

I. Theme actuality

According to official data, sudden death cases are about 10% among all reasons of death. In developed countries every year dies suddenly a lot of people: in the U.S. – 330 000, in Russia -300 000 persons. According to U.S. statistics, 250 000 cases of sudden death occurring at home, at work, in urban centers and only 80 000 cases - in hospitals. It was found that leading cause of sudden death is ventricular fibrillation.

II. Study purposes: to know clinical presentations of sudden death and the first aid on the pre-admission stage.

III. Concrete purposes of the module:

- To know the basic principles of emergency, the role of FD in providing emergency;
- To identify the reasons of cardiac arrest and respiratory standstill;
- To be able to provide emergency in the case of cardiac arrest and respiratory standstill;
- To be able to provide emergency in the case of arrhythmias;
- To know the basic principles of emergency in the case of hypertensive crisis;
- To know the clinical presentations of bronchoobstructive syndrome and the first aid on the pre-admission stage

IV. A student must be able:

- To know the basic principles of emergency, the role of FD in providing emergency;
- To identify the reasons of cardiac arrest and respiratory standstill;
- To provide emergency in the case of cardiac arrest, respiratory standstill, arrhythmias and hypertensive crisis;
- To know the algorithm of first aid in the case of bronchoobstructive syndrome.

V. Task for initial independent training

1 Which forms of chronic glomerulonephritis is not appointed for heparin

A. with urinary syndrome, progressive course

B. with hematuria syndrome

C. with nephrotic syndrome in any stage

D. with nephrotic syndrome in the stage of chronic renal failure

E. with urinary syndrome in the stage of chronic renal failure

2.For treatment of the second chronic pyelonephritis is prescribed all, except:

A. renewal and normalization of passage of urine

B. diuretics

C. immunomodulators

D. glucocorticoids

E. all of mentioned above

3.What from the noted indexes to use for monitoring and assessment of degree of weight of bronchial asthma:

A. OFV1 is a volume of air, which fizzles out at the forced exhalation for the first second after complete inhalation

B. MPV - index of maximal stream which is formed in times of the forced exhalation

C. VCL is a vital capacity of lights

D. FVCL - the vital capacity of lights is forced

4. A patient of 55 years old had acute pyelonephritis with urolithiasis. Which examit is a necessity to perform?

A. urinalysis, complete blood count, bacterial research of urine

B. urinalysis, complete blood count, bacterial research of urine, isotopic rheography

C. Bacterial research of urine, ultrasonic examination of kidneys, urinary ways, survey urography

D. Bacterial research of urine, three glass test

E. urinalysis, complete blood count, three glass test, creatinine of blood

5. The main clinical symptom of COPD is all, except:

A. dyspnea

B. constant or periodic cough

C. expectoration availability

D. choke seizure

E. rise temperatures

6. The primary atypical pneumonias etiology is:

A. mycoplasmal

B. legionellal

C. chlamydial

D. staphylococcal

E. options A, B, C

7. COPD as a disease state characterized by:

A. airflow obstruction that is not fully reversible

B. chronic bronchitis, emphysema, or asthma

C. airflow limitation that is not fully reversible, is usually progressive, and is associated with an abnormal inflammatory response of the lungs to inhaled noxious particles or gases

D. airflow obstruction and emphysema

E. chronic bronchitis with an abnormal inflammatory response of the lungsand emphysema

8. The outcome of COPD is determined by such index:

A. body mass index, obstruction [FEV_1], dyspnea [modified Medical Research Council dyspnea scale]

B. obstruction [FEV_1]

C. body mass index, obstruction [FEV_1], dyspnea [modified Medical Research Council dyspnea scale], and exercise capacity [6MWD]

D. obstruction [FEV_1], dyspnea [modified Medical Research Council dyspnea scale]

E. obstruction [FEV_1], dyspnea [modified Medical Research Council dyspnea scale], and exercise capacity [6MWD]

9. The goal of COPD management is to improve a patient’s functional status and quality of life by:

A. improving symptoms

B. education of patient about the disease and to encourage his/her active participation in therapy

C. preserving optimal lung function, improving symptoms, and preventing the recurrence of exacerbations

D. preserving optimal lung function and preventing the recurrence of exacerbations

E. preserving optimal lung function, improving symptoms

10. Most of oral and inhaled medications which are used for patients with stable COPD are directed at the following causes of airflow limitation:

A. Nutritional support, bronchial mucosal congestion and edema, increased airway secretions

B. Bronchial smooth muscle contraction, bronchial mucosal congestion and edema, airway inflammation

C. Bronchial smooth muscle contraction, airway inflammation, increased airway secretions

D. Bronchial smooth muscle contraction, bronchial mucosal congestion and edema, increased airway secretions

E. Bronchial smooth muscle contraction, bronchial mucosal congestion and edema, airway inflammation, increased airway secretions

Answers:

1	2	3	4	5	6	7	8	9	10
E	**D**	**A**	**C**	**E**	**E**	**C**	**C**	**C**	**E**

VI. Basic questions after a theme

- Basic principles of emergency, the role of FD in providing emergency in the city and countryside.
- The necessity of timely emergency for reducing lethality and disability - the final reducing budgetary costs.
- The reasons cardiac arrest and respiratory standstill.
- The pre-admission emergency in the case of cardiac arrest and respiratory standstill.
- The pre-admission emergency in the case of cardiac arrest and

respiratory standstill.

- Types of arrhythmias, requiring emergency.
- Types of hypertensive crisis, emergency in the case of hypertensive crisis.
- Method of care in the case of bronchoobstructive syndrome.

VIII. The content of theme

CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD)

Definition and epidemiology

Chronic obstructive pulmonary disease (COPD) is primarily a chronic inflammatory disease of the lungs with a predominant disorder of the distal airways and parenchyma, formation of emphysema, a violation of bronchial patency with the development of a completely reversible or irreversible bronchial obstruction caused by a pathological inflammatory response. The disease develops in predisposed persons and is manifested by coughing, sputum secretion and growing breathlessness, has a steadily progressive character with the outcome of chronic respiratory failure and pulmonary heart. COPD refers to commonly occurring illnesses. COPD affects between 8% and 22% of adults aged 40 and over.

According to the results of large screening studies, the prevalence of COPD is higher among people who smoke than those who do not smoke in people older than 40 years old than in young people, in men more than in women.

Pathogenesis

• In the analysis of diagnosed COPD, FEV1 reduction was detected in 27% of patients over the age of 35 years old, were active or former smokers and had a chronic cough. Smoking increases the risk of COPD by 85%.

It has been proved that industrial and domestic harmful emissions (dust, chemicals, etc.) lead to the development of COPD.

• Recurrent airway infections

• α1-antitrypsin deficiency: early-onset panacinar emphysema, 1–3% of COPD cases.Suspect if age <45, lower lungs affected, extrathoracic manifestations (liver disease, fibromuscular dysplasia, pancreatitis).✓serum AAT level (acute phase reactant).

Clinical manifestations

Physical signs depend on the severity of the course:

- With mild course there may not be general symptoms, with auscultation hard breath, dry wheezing;

- In severe cases: central cyanosis, deformation of the chest associated with the development of emphysema, involvement in the support of the muscles, reduction of cardiac dullness, increase in respiratory rate (> 20 / min), prolonged exhalation, the patient exhales through the closed lips, relaxation of respiratory noise, whistling wheezing.

Diagnostic studies

- presence of harmful habits (tobacco smoking) and production factors.
- spirometry, which reveals the first signs of COPD. It is mandatory to measure the speed and volume indicators: lung capacity, forced vital capacity (FVC), forced exhalation volume for 1 sec. (FEV1) and others in the post-bronchodilation test. The summation and correlation of these indicators allows to diagnose COPD.
- the cytological study of sputum in patients with COPD allows us to assess the nature and severity of inflammation of the bronchi, to exclude oncology. Outside the exacerbation of the nature of the sputum is mucous with the predominance of macrophages. In the phase of exacerbation of COPD, the phlegm becomes viscous, purulent.
- clinical blood test for COPD detects polycythemia (increased red blood cells, hematocrit, hemoglobin, blood viscosity) as a consequence of hypoxemia in the bronchial type of the disease.
- the gas composition of the blood
- chest radiography. Patients with COPD on the X-ray diffraction pattern determine the compression and deformation of the bronchial walls, emphysematous changes in the lung tissue.
- ECG changes are characterized by hypertrophy of the right heart of the heart, indicating the development of pulmonary hypertension.
- Diagnostic bronchoscopy with COPD is indicated for differential diagnosis, examination of the bronchial mucosa and assessment of its condition, fetal examination for the analysis of the bronchial secretion.

• **Pulmonary function test**:

Obstruction: ↓↓ forced expir. volume in 1 sec (FEV1), ↓ forced vital capacity (FVC),

FEV1/FVC <0.7 (no significantchangespost bronchodilator), expiratory scooping of flow-volume loop;

[12].

Chronic treatment:

• Treatment of COPD involves the use of drugs, whose action is aimed at increasing the lumen of the bronchi - **bronchodilators** (first-line therapy):**anticholinergics**, β2-agonists (BA), theophylline

Long-acting (LA) anticholinergic (LAA, tiotropium): ↓ exacerbation, ↓ admit, ↓ respiratory failure, better than ipratropium or LABA as mono therapy

Long-acting β2-agonist (LABA): ~15% ↓ in exacerbations, ↓ FEV1 decline, trend toward ↓ mortality

LABA + inhaled steroid.

LAA + LABA + inhaled steroid: ↑ FEV1, ↓ COPD admits

• **Corticosteroids** (inhaled, ICS): ~20% ↓ in exacerbation if FEV1 <2.0 L may slow ↓ FEV1, but more so in combination with LABA; ↑ in pneumonia (not seen with budesonide); no change in mortality with ICS alone

• Antibiotics: daily azithromycin ↓ exacerbation, but not yet routine

• Mucolytic: no change FEV1, but ↓ exacerbation rate

• **Oxygen**: if PaO2 ≤55 mmHg or SaO2 ≤89% (during rest, exercise or sleep) to prevent corpulmonale; only therapy proven to ↓ mortality

• **Prevention**: Flu/Pneumovaccination; smoking cessation (eg, varenicline, bupropion) → 50% ↓ in lung function decline and ↓ longterm mortality

• Rehabilitation: ↓ dyspnea and fatigue, ↑ exercise tolerance, ↓ quality of life

• Experimental.

Lung volume reduction surgery: ↑ exercise capacity, ↓ mortality*if* FEV1 >20%, upper-lobe, low exercise capacity;

bronchoscopic with endobronchial valves with mixed benefits: ↑ lung function but ↑ pneumonia, exacerbation, hemoptysis [16].

Roflumilast (PDE-4 inhibitor): ↑ FEV1 when added to standard therapy

Nocturnal bilevel positive airway pressure: may improve survival, ?decreasequality of life

• Lung transplant: ↑ quality of life and ↓ symptoms, ?survival benefit

Staging and prognosis

• **FEV1**: 50–80% predicted → 3-y mortality ~11%;

30–50% → ~15%;
<30% → ~24%
• **BODE** 10-pt scale; HR 1.62 for respmort., 1.34 mort. for each 1-pt ↑
BMI: ≤21 (+1)
Obstruction (FEV1): 50–64% (+1), 36–49% (+2), ≤35% (+3)
Dyspnea (mMRC (ModifiedMedicalResearchCouncil)scale): walking level (+1), after 100 yard (+2), with activities of daily living (+3)
Excise capacity (6-min walk): 250–349 m (+1), 150–249 (+2), ≤149 (+3) superior to FEV1;
• mMRC score: ≥2 defined as walking slowly because breathlessness or having to stop to catch breath walking level
• Ratio of diameterpulmonary artery/aorta >1 associated with ~3× ↑ risk of exacerbations [17].

COPD exacerbation treatment		
ipratropium	metered dose inhaler 4-8 puffs q 1-2 h or Nebulizer 0.5 mg q1-2 h	First-line therapy
albuterol	metered dose inhaler 4-8 puffs q 1-2 h or Nebulizer 2.5-5 mg q1-2 h	Benefit if component of reversible bronchoconstruction
Corticosteroids	No consensus for optimal dose & duration Consider: Prednisolone 30-40 mg/d ×10-14 d Methylprednisolone 125 mg IV q 6 h ×72 h for more severe exacerbations	↓ treatment failure, ↓ hospital stay, ↑ FEV1 but no mortality benefit, ↑ complications Out-patienttherapy after emergency department visit ↓ relapse ? use peripheral eosinophil>2% to trigger use
Antibiotics	Amoxicillin, trimethoprim - sulfamethoxazole, doxycycline, clarithromycin, antipneumococcalfluoroquinolone, etc, all reasonable (no single	*H.flu, M.cotarrhalis, S.pneumo* Frequent precipitants. ↑ peak expiratory flow, ↓ therapy failure, ↓ subsequent

	antibiotics proven superior). Consider local flora and avoid repeat courses of same antibiotics. ≤5 d course likely enough for mild-mod exacerbation	exacerbation Consider if ↑ cough or sputum purulence
Oxygenation	↑ F1O2 to achieve PaO2≥55-60 or SaO2 90-93%	Watch for CO2 retention (due to ↑ V/Q mismatch, loss of hypoxemic respiratory drive, Haldane effect) *But must maintain oxygenation!*
Noninvasive positive-pressure ventilation	Initiate early if moderate/severe dyspnea, ↓ pH/↑PaCO2, respiratory rate (RR)>25 Results in 58% ↓ intubation, ↓ length of stay by 3.2 d, 59% ↓ mortality Contraindications: change of mental state, inability to cooperate or clear secretions, hemodynamic instability, upper gastrointestinal bleed	
Endotracheal intubation	Consider if PaO2 <55-60, ↑ ing pH, ↑ RR, respiratory fatigue, change of mental state or hemodynamic instability	
Other measure	Mucolytics overall not supported by data Monitor for cardiac arrhythmias	

ASTHMA

Definition and epidemiology

Bronchial asthma is an inflammatory respiratory disease in which cells and inflammatory mediators are involved in the development. Chronic inflammation is associated with hyperreactivity of the bronchi, manifested by recurrent symptoms of wheezing, chills, chest congestion, coughing, especially at night and early in the morning. These episodes are usually associated with a common but variable

(changeable) bronchial obstruction, which is reversible spontaneously or under the influence of therapy.

Clinical manifestations:

The main symptoms are, namely: wheezing, shortness of breath, compression in the chest, cough and airway obstruction. Later descriptions of asthma in children and adults include hyperreactivity and inflammation of the respiratory tract as components of the disease.

Physical examination:

• Wheezing and prolonged expiratory phase

• Presence of nasal polyps, rhinitis, rash → allergic component

• Exacerbation → ↑ RR, ↑ HR, accessory muscle use, diaphoresis, pulsusparadoxus.

Diagnostic studies:

Diagnosis of bronchial asthma includes the following survey methods and features:

- Anamnesis and complaints of the patient;
- Physical examination;
- Conducting spirometry (study of external respiration) - FEV1 (forced expiratory volume in 1 second), PER (peak expiratory rate), FVC (forced vital capacity of the lungs);
- Breath tests with bronchodilators;
- Study on the presence in the sputum (bronchial secretion) and blood of eosinophils, Sharko-Leyden crystals and Kurshman spirals;
- Installation of allergological status (skin, conjunctival, inhalation and nasal tests, determination of general and specific IgE, radio-allergenic absorption test);
- X-ray (chest X-ray);
- Computer tomography (CT);
- Electrocardiogram (ECG);
- Daily pH-metry with suspicion of reflux nature of bronchial asthma;
- 8-minute run test.

Principles of treatment:

The purpose of asthma treatment is to control the disease. Full control of asthma is defined as:

▪ no symptoms during the day

▪ No nighttime awakening due to asthma
▪ no need for urgent treatment
▪ no exacerbations
▪ absence of restrictions on activity, including physical activity
▪ normal lung function (FEV1 and / or POST> 80% of the proper level or personally better)
▪ Minimal side effects of drugs
▪ prevent mortality from asthma.

Basic therapy for bronchial asthma affects the mechanism of the disease, it allows it to be controlled. The basic therapy products include: glucocorticosteroids (including inhalants), cryopreservation, leukotriene receptor antagonists, and monoclonal antibodies.

Symptomatic therapy can affect the smooth muscle of the bronchial tree, as well as relieve asthma attacks. The drugs for symptomatic therapy include bronchodilators: β2-adrenomimetics and xanthines.

Asthma stepwise therapy				
Step 1	Step 2	Step 3	Step 4	Step 5
Rapid-acting β2-agonist prn				
Controller options	Select one	Select one	Do one or more	Add one or both
	Low-dose ICS	Low-dose ICS + LABA	↑ ICS dose (with LABA or LAA)	Oral steroids (lowest dose)
	LTA	Low-dose ICS + LAA	Add LTA	Anti-IgEtherapy
		Medium/high – dose ICS	Add Theo	
		Low-dose ICS + LTA		
		Low-dose ICS + Theo		

(Adapted from Global initiative for Asthma [GINA] 2011 update)

EXACERBATION

According to the definition of GINA, exacerbation of asthma (acute asthma) is an episode of severe manifestations of asthma: increasing shortness of breath, coughing, wheezing, chest pains, or any combination of these symptoms. Respiratory distress and acute respiratory failure may develop. For exacerbation of asthma, a decrease in the volume velocity of the exhaled air flow is characteristic, which can be determined by examining the lung function by decreasing the peak expiratory rate (PER) or the volume of forced exhalation for 1 s (FEV1). In the joint document of the European Respiratory Society (ERS) and the American Thoracic Community (ATS), which is devoted to the control and exacerbation of asthma in clinical trials and clinical practice, it is proposed to isolate severe and moderate exacerbations of asthma.

- Severe exacerbation is defined as an event requiring immediate medical attention from the patient in order to prevent the development of acute respiratory failure and death. Severe exacerbation involves the use of systemic glucocorticosteroids (GCS) (oral or parenteral forms), or an increase in the maintenance dose of GCS for at least 3 days, and / or hospitalization, or an emergency call for the appointment of systemic CSFs.
- The moderate exacerbation of asthma is defined as an event causing anxiety to the patient and requiring a change in therapy, but not severe. With a moderate exacerbation, an increase in symptoms, including night-time, decreased lung function, increased need for short-acting β2-agonists

Severity of asthma exacerbation			
Feature	Mild	Moderate	Severe
Breathless with…	Walking	Talking	At rest
Talking in…	Sentences	Phrases	Words
Mental status	± agitated	agitated	agitated
RR	↑	↑	>30
Accessory muscles	-	+	+
wheeze	Moderate, end-expiration	Loud	Usually loud
HR	<100	100-120	>120
Pulsusparadoxus	Normal (<10)	10-25	>25
PEF	>80%	60-80%	<60%

SaO2	>95%	91-95%	<90%
PaO2	normal	>60	<60
PaCO2	<45	<45	>45

Respiratory arrest imminent: drowsy, abdominal paradox, wheezes inaudible (because of "-" air movement), bradycardia, loss of abdominal paradox (respiratory muscle fatigue). Presence of several parameters (not necessarily all)indicates classification (GINA 2011 update) [11].

Initial treatment:

In case of exacerbation of asthma in each case, a review of the basic anti-asthma therapy of the patient and an analysis of the causes of the developed exacerbation are required.

Indications for referral of the patient to the department of resuscitation and urgent therapy:

1) the need for ventilation support;

2) in severe or life-threatening exacerbations and lack of response to the therapy being manifested:

- deterioration of PSV;
- persistence or aggravation of hypoxia;
- hypercapnia;
- a study of blood gases showing ↑ pH or ↓ H +;
- exhaustion, weak breathing;
- drowsiness, confusion of consciousness, altered consciousness;
- stop breathing.

High-dose IGCC therapy with a nebulizer, in particular budesonide 2 or 4 mg / day for 4 administrations, was as effective as oral therapy with GCS (prednisone 40 mg / day). This strategy for treatment of exacerbation was primarily studied in children, but in an adult study, it also demonstrated efficacy in the treatment of asthma exacerbations of varying degrees of severity . The use of a suspension of budesonide (2 mg 2 g / day) via a nebulizer for 5 days was compared with conventional asthma exacerbation therapy with prednisone 15 mg 2 g / day in adult patients. The results showed that both strategies for exacerbating asthma treatment were effective in reducing the symptoms of exacerbation and restoration of the lung function.

URINARY TRACT INFECTIONS

Definitions

• Anatomic:

- **lower**: urethritis, cystitis (superficial infection of bladder)
- **upper**: pyelonephritis (inflammation of renal parenchyma), renal/perinephric abscess, prostatitis

• Clinical:

- Uncomplicated UTIs are usually considered to be cystitis or pyelonephritis that occurs in adult premenopausal women without structural or functional abnormalities of the urinary tract, in non-pregnant women and not having any significant concomitant illness that could lead to more severe outcomes. In addition, some experts consider uncomplicated UTIs, even if they affect women in postmenopausal or patients with well-controlled diabetes. Among men, most UTIs occur in children or elderly patients, due to anatomical anomalies or instrumental procedures, and are considered complicated. Rare UTI that develops in men aged 15-50, usually in men who have unprotected anal sex or those who have uncircumcised penis, and they are generally considered to be uncomplicated. The UTIs of men of this age who did not have unprotected anal sex or uncircumcised penis are very rare and, although also considered uncomplicated, require an assessment of the presence of urological anomalies.
- Complicated IMP can develop in persons of any gender and age. Such infection is usually considered to be pyelonephritis or cystitis, which does not meet the criteria for uncomplicated infection; that is, it includes the following:

- The patient has structural or functional anomalies of the urinary tract and obstructs the flow of urine.
- The patient has concomitant illnesses that increase the risk of infection or resistance to treatment, such as poorly controlled diabetes mellitus, chronic kidney disease, or immunodeficiency.
- The patient is a pregnant or a child.
- The patient has recently undergone instrumental procedures or operations on the urinary tract.

Microbiology:

The bacteria that are most commonly cause cystitis and pyelonephritis are as follows:

- Intestinal, as a rule, gram-negative aerobic bacteria (most often)
- Gram-positive bacteria (less often)

Normally, in the urinary tract, strains of Escherichia coli with specific adhesion factors to the transitional epithelium of the bladder and ureters are detected in 75-95% of cases. The remaining gram-negative uropathogens are other enterobacteria, usually Klebsiella or Proteus mirabilis, and sometimes Pseudomonas aeruginosa. Among gram-positive bacteria, Staphylococcus saprophyticus is isolated in 5-10% of cases of bacterial UTIs. Less commonly known gram-positive bacterial isolates are Enterococcus faecalis (streptococcus group D) and Streptococcus agalactiae (streptococcus group B) which may be pathogens, especially if they have been isolated from patients with uncomplicated cystitis.

In hospitalized patients E. Coli is detected in almost 50% of cases. The Gram-negative species Klebsiella, Proteus, Enterobacter,Pseudomonas and Serratia make up about 40% of the pathogen spectrum, while the gram-positive bacteria E. faecalis, S. saprophyticus and Staphylococcus aureus are among the remaining pathogens. [11].

Clinical manifestations:

In elderly patients and patients with a neurogenic bladder or a permanently installed catheter, the disease may initially be manifested by sepsis and delirium, and not by symptoms related to the urinary system.

If the symptoms are present, they may not correspond to the localization of the infection within the urinary tract, since there is a significant "overlap"; Nevertheless some generalizations can be useful.

In case of urethritis is the main symptoms is dysuria and, mainly in men, secretion from the urethra. The secretions may be purulent, whitish or mucous. Such characteristics of the secretion as the number of pus, do not allow a reliable differentiation of gonococcal from non-gonococcal urethritis.

The onset of cystitis is usually sudden, it consists in the occurrence of pollakiuria, imperative appetite and burning, or painful urination in small portions of urine. Necturia is often observed in combination with pain in the superlobic region and the lower parts of the lower lumbar spine. The urine is often cloudy and microscopic (or rarely significant) hematuria may occur. Subfebrile fever may

develop. Pneumaturia (the presence of air in the urine) can be observed when the infection occurs due to the bladder-intestinal or vesicular-vaginal fistula, or with emphysematous cystitis.

In acute pyelonephritis, the symptoms may be the same as with cystitis. One third of patients are treated with pollakiuria and dysuria. Nevertheless, with pyelonephritis, symptoms usually include chills, fever, low back pain, cramping abdominal pain, nausea and vomiting. If there is no or insignificant rigidity of the muscles of the abdominal wall, sometimes it is possible to palpate painful, enlarged kidneys. Usually on the side of an inflammation it is revealed pain in percussion of the edge-vertebral angle. In children, the symptoms are usually erased or less specific.

Diagnostic studies:

1) general clinical analyzes: general blood test, general urine analysis, biochemical blood tests (urea, creatinine) and urine (diastase).

The most informative at the primary stage is the general analysis of urine. For the study, an average portion of morning urine is taken. In the study, count the number of leukocytes, erythrocytes, which allows you to suspect bacteriuria (bacterial inflammation process). It is also informative indicators such as protein, sugar, specific gravity.

2) bacteriological method (urine culture on special nutritional media in order to detect the growth of certain types of microorganisms in them), in which the average portion of morning urine is taken into sterile dishes;

3) method of PCR (with negative backstop and ongoing infection of the urinary tract) - to identify such microorganisms as chlamydia, mycoplasmas.

4) Instrumental diagnostic methods: ultrasound examination of the kidneys and the bladder, cystoscopy, X-ray contrast study or intravenous urography, radionuclide studies, and others.

Treatment of UTIs

- Antibiotics
- Sometimes surgical treatment (for example, for the purpose of drainage of abscesses, correction of the primary structural anomalies or elimination of obstruction)

All forms of bacterial UTI require antibiotic therapy. In patients with severe dysuria, phenazopyridine can help control the symptoms of the disease before the onset of antibiotics (usually within 48 hours).

The choice of the antibiotic should be based on the allergic history of the patient and his adherence to treatment, samples of sowing with local resistance (if known), the presence of antibiotics and their cost, and the opinion of the patient and doctor regarding the risk of failure treatment. The propensity to induce antibiotic resistance should also be considered. Once the urine is ready, the antibiotic should be modified depending on the available seeding results and the sensitivity to the effective preparation of the narrowest spectrum of action directed against certain pathogens.

Surgical correction is usually required for obstructive uropathy, anatomical anomalies, and with such neuropathic lesions of the urinary tract as compression of the spinal cord. Drainage of blocked urinary tract with catheter facilitates rapid control of UTI. Sometimes surgical drainage requires cortical kidney abscesses or paranephral abscesses of renal cellulose. If there is inflammation of the lower urinary tract, instrumental manipulation should be postponed if possible.

ACUTE KIDNEY INJURY (AKI)

Definition

• AKI: abrupt (<48 h) ↑ creatinine(Cr) ≥0.3 mg/dL, ↑ Cr ≥50%, or urine output<0.5 mL/kg/h for ≥6 h additional gradations based on further ↑ Cr & ↓ urine output, but not used clinically [15].

• *Cannot* estimate glomerular filtration rate using Cr in setting of AKI

Workup

• **H&P**: recent procedures & meds; thirst; vital signs&vol status; signs and symptoms of obstruction, vascular or systemic disease; ischemia (prerenal &acute tubular necrosis) accounts for >50% of in-hospital AKI

• **Urine evaluation**: output, urinalysis, **sediment**, electrolytes, and osmolality

• **Fractional excretion of sodium (FENa)**

<1% → prerenal, contrast, glomerulonephritis; >2% → acute tubular necrosis in setting of diuretics

• Renal ultrasound or CT: rule out obstruction & evaluate kidney size to estimate chronicity of kidney disease

• Serologies (if indicated)

• Renal biopsy: may be necessary if cause remains unclear (especially if hematuria and/or proteinuria) [12].

Etiologies and diagnosis of acute kidney injury		
Etiologies		Urinalysis:sediment, indices
Prerenal	**↓ Effective arterial volume** Hypovolemia, ↓ cardiac contractility (eg., CHF), systemic vasodilatation (eg., sepsis) **Renal vasoconstriction**: NSAIDs, ACEI/ angiotensin receptor blocker (ARB), contrast, calcineurin inhibitors, hyperCa **Large vessel:**renal artery stenosis (bilateral + ACEI), venous thromboembolus, vasculitis, dissection, abdominal compartment syndrome.	Bland Transparent hyaline casts FE Na<1% BUN/Cr >20 U Na < 20 U osm> 500
Intristic	**Acute tubular necrosis (ATN)** Ischemic progression of prerenal disease Toxins: - Drugs: AG, amphotericin, cisplatin, starch - Pigments: hemoglobin, myoglobin - Proteins: Ig light chains - Crystals: urinalysis, acyclovir, methotrexate, indinavir, oral naPO4 Contrast induced AKI (CIAKI)	Pigmented granular muddy Brown cast in -75% (± in CIAKI) ± red blood cells& protein from tubular damage FF Na> 2%, BUN /Cr < 20, U Na> 20 (except pigment, CIAKI) U osm< 350
	Acute interstitial nephritis (AIN) Allergic: β-lactams, sulfa drugs, NSAIDs, proton pump inhibitors Infections: pyelonephritis, legionella, tuberculosis, leptospirosis Infiltrative: sarcoid, lymphoma, leukemia Autoimmune: Sjogren's, tubuleinterstitial nephritis and uveitis syndrome, IgG4, systemic	white blood cells, white blood cell casts.± red blood cells with negativeUCx +urine eos in abx + lymphs in NSAIDs

	lupus erythematosus	
	Small-med vessel:chol, emboli, polyarteritisnodosa, thrombotic microangiopathy(hemolytic uremic syndrome / thrombotic thrombocytopenic purpura, disseminated intravascular coagulation, preeclampsia, antiphospholipid antibody syndrome, malignant hypertensin, sclerodermia renal crisis)	± red blood cells + urine eosinophils in chol, emboli
	Glomerulonephritis	Dysmorphic red blood cells, red blood cell casts
Post	**Bladder neck:**benign prostatic hypertrophy, prostate cancer, neurogenic bladder, anticholinergic meds	Blad ± nondysmorphicred blood cells
	Ureteral (bilateral): malignancy, lymphadenopathy, retroperitoneal fibrosis, nephrolithiasis	FE Na variable

Treatment

- Treat underlying disorder; ? steroids if acute interstitial nephritis
- Prerenal: Isotonic intravenous fluidsalb, starch nephrotoxic
- Avoid nephrotoxic insults; review dosing of renally cleared drugs
- Optimize hemodynamics; may take 1–2 week to recover from acute tubular necrosis
- Watch for and correct volume overload, electrolyte (↑ K, ↑ PO4), & acid/base status
- If obstruction is diagnosed and relieved, watch for:

Hypotonic diuresis (2° buildup of blood urea nitrogen, tubular damage); therapy withintravenous fluids (eg, 1/2 normal saline)

Hemorrhagic cystitis (rapid changes in size of bladder vessels); avoid by decompressing slowly.

• Indications for urgent dialysis (when condition refractory to conventional therapy)

Acid-base disturbance: acidemia

Electrolyte disorder: generally hyperkalemia; occasionally hypercalcemia, tumor lysis [13].

Intoxication: methanol, ethylene glycol, lithium, salicylates

Overload of volume (congestive heart failure)

Uremia: pericarditis, encephalopathy, bleeding

• *No* benefit to dopamine, diuretics, or mannitol.

CHRONIC KIDNEY DISEASE (CKD)

Definition and etiologies

Chronic kidney disease (CKD) is a syndrome that reflects the progressive nature of chronic kidney disease, which is based on the mechanisms of the formation of nephrosclerosis. CKD almost always occurs in the early stages as the asymptomatic process

• Etiologies: Significant influence on the development and progression of chronic kidney disease can be caused by a number of factors: medicines, alcohol and smoking, the state of the environment, climate, character and nutrition traditions, genetic features of the population, infection, etc. Many factors of the development of kidney dysfunction at the same time are "traditional" cardiovascular risk factors: arterial hypertension, diabetes, dyslipidemia, obesity, metabolic syndrome, tobacco smoking. [14].

Risk factors include: Unmodifiable risk factors for CKD include: elderly, male, initially low number of nephrons, racial and ethnic characteristics, hereditary factors (including family history of CKD). Modifiable risk factors for development CKD include: diabetes, hypertension, cardiovascular disease, autoimmune diseases, chronic inflammation / systemic infections, infections and urinary tract concretions, urinary tract obstruction, medicinal toxicity, high protein intake, dyslipoproteinemia, tobacco smoking, obesity / metabolic syndrome, hyperhomocysteinemia, pregnancy.

Stage of CKD		
GRF Stage	**GRF mL/min/ 1.73 m²**	**Goals**
1 (normal or ↑ GRF)	>90	Diagnosis/Therapy of underlying condition & comorbidities, slow progression; cardiovascular risk

		reduction
2 (mild)	60-889	Estimate progression
3 (moderate)	30-59	Evaluate and treat complications
4 (severe)	15-29	Prepare for renal replacement therapy (RRT)
5 (kidney failure)	<15 or dialysis	Dialysis if uremic
Albuminuria stage: Based on albuminuria (mg/d) or spot urine alb (μg) to Cr (mg) ratio: normal or mildly ↑ (<30); moderate↑ or microalbuminuria (30-299); or severely - ↑ or macroalb (≥300)		

Treatment

Includes: etiotropic treatment of CKD, prevention of progression of CKD, prevention of CKD complications and their treatment, preparation for treatment and treatment of renal replacement therapy.

General principles

1. Treatment of the concomitant diseases.
2. Prevention of cardiovascular disease (high risk in patients with CKD), including smoking cessation.
3. Avoid nephrotoxic drugs. Remember to adjust the dose of drugs that are removed from the body by the kidneys to ClKr.
4. Prevent infection by vaccination:

1) annual vaccination against influenza (in all patients with CKD)

2) vaccination with polyvalent pneumococcal vaccine (all patients with GFR <30 ml / min / 1.73 m2, repeated after 5 years)

3) vaccination against hepatitis B (all patients with GFR <30 ml / min / 1.73 m2 or earlier if there is a gradual decrease in GFR).

GLOMERULONEPHRITIS (GN)

Definition

Glomerulonephritis is a kidney disease of the immune-inflammatory nature. Affects predominantly renal glomeruli. To a lesser extent, interstitial tissue and renal tubules are involved in the process. Glomerulonephritis proceeds as an independent disease or develops in some systemic diseases (infective endocarditis, hemorrhagic vasculitis, systemic lupus erythematosus). Clinical picture of

glomerulonephritis is composed of urinary, edema and hypertonic syndromes. Diagnostic value for glomerulonephritis is given by data from urine tests, Zimnitsky and Reberg tests, ultrasonography of kidneys and ultrasonic dopplerography of renal vessels. [13].

Workup:

The results of analyzes are characterized by the following changes:

- micro- or macro hematuria. When macrohematuria urine becomes black, dark brown, or acquires the color of "meat spaghetti". At microhematuria, changes in urine color are not observed. In the first days of the disease in the urine, there are predominantly fresh red blood cells, then leeches.
- moderate (usually within 3-6%) albuminuria for 2-3 weeks;
- granular and hyaline cylinders with microhematuria, erythrocytes - under macrohematuria according to microscopic results of urine sedimentation;
- nicturia, decrease in diuresis during Zimnitsky's trial. Preservation of the concentration capacity of the kidneys is confirmed by high relative urinary density;
- reduction of filtration capacity of the kidneys based on the results of endogenous creatinine clearance study;

Based on the results of a general blood test in acute glomerulonephritis, leukocytosis and elevated ESR are detected. The biochemical analysis of blood confirms an increase in the content of urea, cholesterol and creatinine, an increase in the titre of AST and ASL-O. Characteristic acute azotemia (increased content of residual nitrogen).

Ultrasound of kidneys and ultrasonic dopplerography of kidney vessels is carried out. If laboratory and ultrasound data are doubtful, a kidney biopsy is performed to confirm the diagnosis of glomerulonephritis and a subsequent morphological examination of the resulting material.

Treatment

Patients are prescribed antibacterial therapy (ampicillin + oxacillin, penicillin, erythromycin), correction of immunity with nonhormonal (cyclophosphamide, azathioprine) and hormonal (prednisolone) preparations. The complex of therapeutic measures includes anti-inflammatory treatment (diclofenac) and symptomatic therapy aimed at reducing edema and normalizing blood pressure. Sanatorium and spa treatment is recommended as the follow-up stage.

TASKS FOR FINAL CONTROL

1. The data of pulmonary function test, which is typical for COPD is the following:

A. ↓↓ forced expir. volume in 1 sec (FEV1), ↓ forced vital capacity (FVC)

B. ↓↓ forced expir. volume in 1 sec (FEV1), ↓ forced vital capacity (FVC), FEV1/FVC <0.7 (no significant changes post bronchodilator)

C. ↓↓ forced expir. volume in 1 sec (FEV1), ↓ forced vital capacity (FVC), FEV1/FVC <0.5 (no significant changes post bronchodilator)

D. ↓↓ forced expir. volume in 1 sec (FEV1), ↓ forced vital capacity (FVC), FEV1/FVC <0.9 (no significant changes post bronchodilator)

E. FEV1/FVC <0.7 (no significant changes post bronchodilator)

2. Clinical manifestations of asthma are the following signs:

A.episodic exacerbation

B.wheezing, chest tightness, sputum

C.wheezing, cough and dyspnea

D.dyspnea, chest tightness, sputum

E.cough, chest tightness, sputum

3. Asthma plus" syndromes are the following:

A.nasal polyps

B.asthma, allergic rhinitis, atopic dermatitis

C.eosinophilia

D.arterial hypertension

E. Hypoglycemia

4. Peak flow readings are classified into 3 zones of measurement; green, yellow, and red. Red Zone is into the following value:

A.<60% of the usual or normal peak flow readings

B.<40% of the usual or normal peak flow readings

C.30 to 49% of the usual or normal peak flow readings

D.<50% of the usual or normal peak flow readings

E.40 to 49% of the usual or normal peak flow readings

5. Peak flow readings are classified into 3 zones of measurement; green, yellow, and red. Yellow Zone is into the following value:

A.30 to 59% of the usual or normal peak flow readings
B.40 to 69% of the usual or normal peak flow readings
C.50 to 69% of the usual or normal peak flow readings
D.40 to 79% of the usual or normal peak flow readings
E.50 to 79% of the usual or normal peak flow readings

6. “Controller” medications for asthma daily control are:

A.Inhaled corticosteroids, Short-acting inhaled β2-agonists, Theophylline
B.Inhaled corticosteroids,Long-acting inhaled β2-agonists, Long-act inhalator anticholinergics
C.Inhaled corticosteroids,Long-acting inhaled β2-agonists, Theophylline
D.Short-acting inhaled β2-agonists, Long-act inhalator anticholinergics, Theophylline
E.Inhaled corticosteroids,Long-act inhalator anticholinergics, Theophylline

7. “Reliever” medications, which are used prn to quickly relieve symptoms are the following:

A.Short-acting inhalator β2-agonists,Short-acting inhalator anticholinergics
B.Short-acting inhaled β2-agonists, Theophylline
C.Short-acting inhalator anticholinergics,Theophylline
D.Inhaled corticosteroids,Theophylline
E.Inhaled corticosteroids, Short-acting inhalator β2-agonists

8. Which types of chronic glomerulonephritis not is appointed at a heparin:

A. urinary syndrome, progressive course
B. hematuria
C. nephrotic syndrome
D. nephrotic syndrome with chronic renal failure
E. urinary syndrome with chronic renal failure

9. For treatment of the secondary chronic pyelonephritis is prescribed all, except:

A. renewal and normalization of passage of urine
B. diuretics

C. immunomodulators

D. glucocorticoids

E. all of mentioned above

10. Which indexes is used for monitoring and assessment of degree of asthma:

A. OFV1 - volume of air, which fizzles out at the forced exhalation for the first second after complete inhalation

B. MVS - index of maximal stream which is formed in times of the forced exhalation

C. TLC - a total vital capacity of lungs

D. FVC - the forced vital capacity of lungs

E. all of mentioned above

Answers:

1	2	3	4	5	6	7	8	9	10
B	**C**	**B**	**E**	**D**	**B**	**A**	**E**	**D**	**A**

TOPIC 6
THE ALHORHYTM OF FD IN THE CASE OF ENDOCRINOLOGICAL AND GASTROINTESTINAL DISEASES

I. Theme actuality. Endocrine and metabolic diseases span a vast range of conditions. Together, they affect many millions of people all over the world and can profoundly decrease quality of life. While modern treatments have been found for many of these diseases, we have yet much to learn about interactions between genetic and environmental factors that underlies progression of endocrine system diseases and which may provide avenues to their prevention and new therapy algorythms.

Gastrointestinal disorders are responsible for around 1 million of deaths each year across Europe for all ages. This diseases areusually associated with substantial morbidity and healthcare costs. The incidence and prevalence of many gastrointestinal diseases are highest amongst the very young and the elderly, and as the European population ages, the disease burden will inevitably increase. Unfortunately, despite their substantial prevalence and global impact, many digestive diseases are still poorly studied and attract not as much attention from scientists and practical workers even with funding perspective.

II. Study purposes: to learn the algorhytm of FD in the case of endocrinological and gastrointestinal diseases

III. Concrete purposes of the module:

- to know the features of diabetes mellitus I and II types in the practice of FD;
- to know the algorhytm of thyroid gland diseases in FD practice;
- to be aware ofsyndromological approach for patients with gastrointestinal diseasesin FD practice.

IV. A student must be able:

• to know the clinical presentations of diabetes mellitus I and II types.

• to know the clinical presentations of thyroid gland diseases.

• to identify the dyspepsia, acute and chronic abdominal pain, nausea, vomiting, diarrhea and constipation, GI-bleeding, therapeutic approach of pre-admission and emergency care.

• to know the principles of diet and treatment of gastrointestinal diseases.

V. Task for initial independent training

1. Patient N. 35 years old, for two days has complaints about abdominal pain with localization in the left upper quadrant, weakness, noisia, vomiting, dizziness. The worsening of his health started about 5 hours ago. BP – 90/60 mm Hg, Heart rate – 130 per minute. We know from his medical history that 8 days ago he suffered from blunt trauma of abdomen. Name the diagnosis?

A. Appendicitis;

B. Acute peritonitis;

C. Intestine rupture;

D. Liver rupture;

E. Spleen rupture.

2. Family doctor visits patient K., 51 years old, with complaints about sharp pain in the right upper quadrant of abdomen that started two days ago after the patient felt. Pain has irradiation to the right scapula. Also patient had vomiting the next day after trauma. During the examination doctor found that patient has tension in the right half of the abdomen. In patient are also present positive Ortner and Musset symptoms.Name the most likely diagnosis?

A. Acute cholecystitis;

B. Spleen rupture;

C. Acute intestinal obstruction;

D. Intestine rupture;

E. Acute pancreatitis.

3. An 82-year-old female with a history of untreated atrial fibrillation presents to the ED with abdominal pain after consuming dinner. She states that the abdominal pain is severe yet physical examination shows a mildly tender abdomen without rebound or guarding. Blood lactate level is found to be elevated. She has no prior abdominal surgeries. Whatisthelikelydiagnosis?

A. Pancreatitis

B. AcuteMesentericIschemia

C. PepticUlcerDisease

D. Bowelobstruction

E. Appendicitis

4. To the family doctor admitted 25 years old patient with complains about lower abdomen pain, also weakness, which started rught on the 12th day after 1st day of period. BP 80/45 mmHg, heart rate 132 per minute. Name the diagnosis?

A. Ovarian apoplexy;

B. Acute appendicitis;

C. Ovarian cyst torsion;

D. Pelvioperitonitis;

E. Ectopic pregnancy.

5. The patient who is 47 years old has complains about right lumbar pain with irradiation to the lower abdomen. Patient was unable to move, groaning. Heart rate 110, 120/80 mm Hg. In patient there is tension in the right iliac region muscles. Lasseg, Schetkin and Ortner signs are negative, but the Pasternatsky sign is positive.Name the diagnosis?

A. Appendicitis;

B. Renal colic;

C. Radiculitis;

D. Duodenal ulcer perforation;

E. Cholecystitis.

6. Microvascular complications of diabetes include:

A. retinal, renal, and neuropathic disease

B. retinal, renal, and neuropathic disease which affects autonomic nerves

C. retinal, renal, and neuropathic disease which affects peripheral nerves

D. coronary artery and peripheral vascular disease

E. peripheral vascular disease

7. Macrovascular complications diabetes include:

A. retinal, renal, and neuropathic disease

B. retinal, renal, and neuropathic disease which affects autonomic nerves

C. retinal, renal, and neuropathic disease which affects peripheral nerves

D. coronary artery and peripheral vascular disease

E. peripheral vascular disease

8. Major risk factorsfor type 2 diabetes mellitus are the following:
   A. Family history of type 2 diabetes in a first-degree relative, History of gestational diabetes mellitus or of delivering a baby with a birth weight of over 9 lb
   B. Age greater than 45 years, weight greater than 120% of desirable body weight
   C. Hypertension (>140/90 mm Hg) or dyslipidemia (HDL cholesterol level < 40 mg/dL or triglyceride level >150 mg/dL)
   D. Polycystic ovarian syndrome
   E. all of mentioned above

9. Metabolic syndrome usually associated with insulin resistance, can also occur in patients with normal glucose tolerance, prediabetes, or diabetes mellitus. When it can be diagnosed:
   A. When there is abdominal obesity, low level of HDL cholesterol and hypertension;
   B. When there is abdominal obesity, elevated triglyceride level and hypertension;
   C. When there is low level of HDL cholesterol, fasting glucose value of 100 mg/dL or higher and hypertension;
   D. Hypertension, fasting glucose value of 100 mg/dL or higher;
   E. At least 3 of the following 5 conditions: abdominal obesity, elevated triglyceride level, low level of HDL cholesterol, hypertension, fasting glucose value of 100 mg/dL or higher.

10. Type 2 diabetes management includes the following, accept:
   A. blood glucose should be maintained at near-normal levels (preprandial levels of 90-130 mg/dL and hemoglobin A1C [HbA1c] levels <7%)
   B. focus on glucose alone does not provide adequate treatment for patients with diabetes mellitus
   C. Treatment involves multiple goals (ie, glycemia, lipids, blood pressure)
   D. Only dietary and exercise modifications is enough
   E. Aggressive glucose lowering may not be the best strategy in all patients

Answers:

1	2	3	4	5	6	7	8	9	10
A	**E**	**B**	**E**	**B**	**A**	**D**	**E**	**E**	**D**

VI. Basic questions after theme

- The diabetes mellitus I AND II types in the practice of FD: management plan, treatment protocols, rehabilitation, and prophylactic medical check-up, the expertise of disability.
- The thyroid gland diseases: diagnostics and treatment, expertise of disability.
- The syndromological approach for patients with gastrointestinal diseases: early diagnostics, management plan, treatment protocols (dyspepsia, acute and chronic abdominal pain, nausea, vomiting, diarrhea and constipation, GI-bleeding).
- Theprophylactic medical check-up for patients with gastric and duodenum ulcer, oncological screening, management plan. The principles of diet and treatment. The prevention. The prophylactic medical check-up. Resort treatment. The expertise of disability.

VII. Practical skills: The examination of patients with endocrinological and gastrointestinal diseases, make the algorithms of medical care in the pre-admission stage.

VIII. The content of theme

DIABETES MELLITUS

Definition

Diabetes mellitus is a chronic endocrine disease which is caused by the inherited and/or acquired deficiency in insulin production by the pancreas, or by the ineffectiveness (resistance) of produced insulin. Such a deficiency results in increased blood glucose levels, which in turn damage leads to many systems complications, in particular the blood vessels and nerves.

Diagnostic standarts

• HbA1clevels more than 6.5 or fasting glucose kevels more than ≥126 mg/dL × or random glucose level higher than 200 mg/dL;

• Blood glc higher than normal, but not frank DM

Categories

• **Type 1**: Type 1 diabetes mellitus is characterized by loss of the insulin-producing beta cells of the pancreatic islets, leading to insulin deficiency. This form develops most frequently in children and adolescents, but is being increasingly noted later in life.

• **Type 2**: Type 2 DM is characterized by insulin resistance, which may be combined with relatively reduced insulin secretion.

Condition	2 hour glucose	Fasting glucose	HbA_{1c}	
Unit	mmol/l(mg/dl)	mmol/l(mg/dl)	mmol/mol	DCCT %
Normal	<7.8 (<140)	<6.1 (<110)	<42	<6.0
Impaired fasting glycaemia	<7.8 (<140)	≥6.1(≥110) & <7.0(<126)	42-46	6.0–6.4
Impaired glucose tolerance	≥7.8 (≥140)	<7.0 (<126)	42-46	6.0–6.4
Diabetes mellitus	≥11.1 (≥200)	≥7.0 (≥126)	≥48	≥6.5

Compairing of diabetes types

Feature	Type 1 diabetes	Type 2 diabetes
Onset	Sudden	Gradual
Age at onset	Mostly in children	Mostly in adults
Body size	Thin or normal	Often obese
Ketoacidosis	Common	Rare
Autoantibodies	Usually present	Absent
Endogenous insulin	Low or absent	Normal, decreased or increased
Concordance in identical twins	50%	90%
Prevalence	~10%	~90%

Other causes of diabetes: glucocorticoids use, glucagonoma, pancreatic resection, endocrinopathies, gestational diabetes, drug inducted (protease inhibitors, atypical antipsychotics) [11].

The symptoms of diabetes may be pronounced, subdued, or even absent.

In the type 1 diabetes, the classic symptoms are excessive secretion of urine (polyuria), thirst (polydipsia), weight loss and tiredness.

These symptoms may be less marked in type 2 diabetes. In this form, it can also happen that no early symptoms appear and the disease is only diagnosed several years after its onset, when complications are already present.Complications [13].

Complications associated with diabetes mellitus

- Diabetic retinopathy is a leading cause of blindness and visual disability.
- Diabetic nepgropathy - diabetes is among the leading causes of kidney failure
- Diabetic foot disease, due to changes in blood vessels and nerves, often leads to ulceration and subsequent limb amputation.
- Diabetic neiropathy casing painin the limbs and can lead to motionless.

Outpatient screening and treatment goals

• Goal for HbA1C q3–6mo should be less than 7% for most patients. If patient has history of severe hypoglycemia or other comorbidities family docter can use goal HbA1C under 7.5–8% .

• Microalbuminuria should be diagnosed by screening yearly with spot microalbumin/Cr ratio, goal <30 mg/g [15].

Basic principles of diabetes management:

- Interventions to promote and support healthy lifestyles, including healthy diet, physical activity, avoidance of tobacco use and harmful use of alcohol.
- Medication for blood glucose control – insulin or oral hypoglycaemic agents as required. y Medication to control cardiovascular disease risk.
- Regular exams for early detection of complications: comprehensive eye examination1 , measurement of urine protein, and assessment of feet for signs of neuropathy.
- Standard criteria for referral of patients from primary care to secondary or tertiary care [14].

DIABETIC KETOACIDOSIS (DKA)

Diabetic ketoacidosis (DKA) is a potentially life-threatening complication of diabetes mellitus. Smptoms includes vomiting, abdominal pain, deep gasping breathing (with a very specific smell), increased urination, weakness, confusion, and occasionally loss of consciousness. Triggers:

- infection,
- incorrect insulin use,
- stroke
- certain medications such as steroids

DKA may be diagnosed when the combination of hyperglycemia (high blood sugars), ketones in the blood or on urinalysis and acidosis are demonstrated [11].

Three stages of DKA severity according to The American Diabetes Association:

- Mild: blood pH mildly decreased to between 7.25 and 7.30 (normal 7.35–7.45); serum bicarbonate decreased to 15–18 mmol/l (normal above 20); the person is alert

- Moderate: pH 7.00–7.25, bicarbonate 10–15, mild drowsiness may be present
- Severe: pH below 7.00, bicarbonate below 10, stupor or coma may occur

HYPEROSMOLAR HYPERGLYCEMIC STATE

Definition, precipitants, pathophysiology.

Hyperosmolar hyperglycemic state (HHS) is a complication of diabetes mellitus in which high blood sugar results in high osmolarity without significant ketoacidosis.

Symptoms of hyperosmolar hyperglycemic state include:

- Altered level of consciousness
- Blurred vision, headaches, focal seizures, myoclonic jerking, reversible paralysis
- Flaccidity, depressed reflexes, tremors or fasiciculations
- Hyperviscosity and increased risk of blood clot formation
- Dehydration
- Weakness
- Weight loss
- Nausea, vomiting, and abdominal pain
- Low blood pressure [12].

According to the American Diabetes Association, diagnostic features include:

- ✓ Plasma glucose level higher than 30 mmol/L
- ✓ Serum osmolality >320 mOsm/kg
- ✓ Profound dehydration, and therefore substantial thirst (polydipsia)
- ✓ Serum pH >7.40
- ✓ Bicarbonate >15 mEq/L
- ✓ Small ketonuria and absent-to-low ketonemia (<3 mmol/L)
- ✓ Consciousness alterations
- ✓ Creatinine > 1.5 mg/dL

Treatment

Isotonic saline (0.9% NaCl) is recommended at 15–20 mL/kg during the first 1–2 h, followed by 250–500 mL/h until resolution of the hyperglycemic crisis. People with HHS can be dehydrated by 8 to 12 liters. Potassium replacement is often required as the metabolic problems are corrected. It is generally replaced at a rate 10 mEq per hour as long as there is adequate urinary output. During insulin treatment and hydration, serum potassium levels rapidly fall; therefore, it is

recommended that potassium replacement should be initiated when serum levels fall <5.5 mEq/L, with the goal to maintain a serum potassium concentration in the range of 4–5 mEq/L.

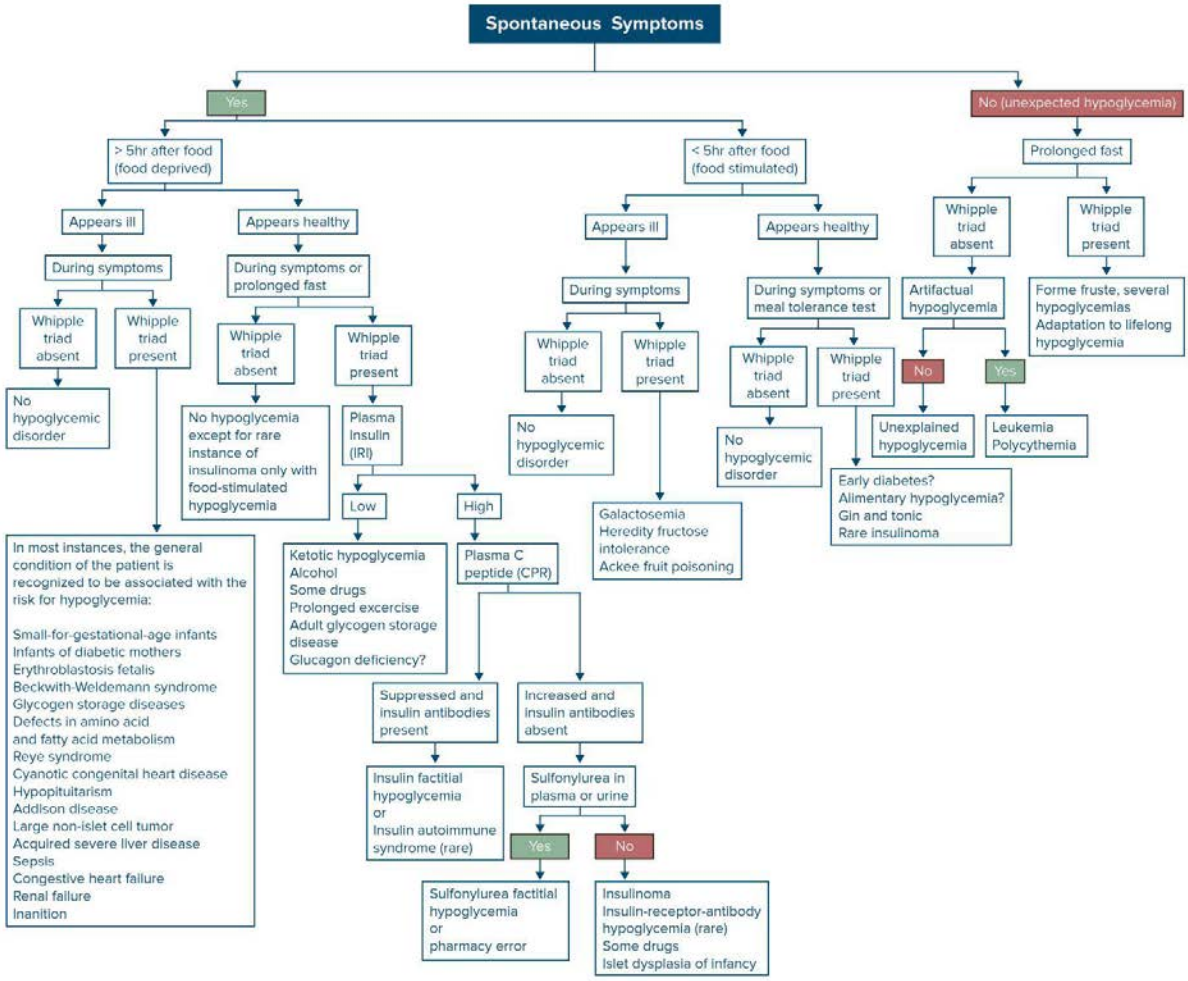
HYPOGLYCEMIA

Hypoglycemia is characterized by a reduction in plasma glucose concentration to a level that may induce symptoms or signs such as altered mental status and/or sympathetic nervous system stimulation.

The glucose level at which an individual becomes symptomatic is highly variable (threshold generally at < 50 mg/dL). Carefully review the patient's medication and drug history for potential causes of hypoglycemia (eg, new medications, insulin usage or ingestion of an oral hypoglycemic agent, possible toxic ingestion).

Symptoms:

- Shakiness, anxiety, nervousness
- Palpitations, tachycardia
- Sweating, feeling of warmth (sympathetic muscarinic rather than adrenergic)
- Pallor, coldness, clamminess
- Dilated pupils (mydriasis)
- Hunger, borborygmus
- Nausea, vomiting, abdominal discomfort
- Headache [13].



Picture 1 - Diagnostic algorithm for hypoglycemia

Treatment

Treatment of some forms of hypoglycemia, such as in diabetes, involves immediately raising the blood sugar to normal through the ingestion of carbohydrates, determining the cause, and taking measures to hopefully prevent future episodes. However, this treatment is not optimal in other forms such as reactive hypoglycemia, where rapid carbohydrate ingestion may lead to a further hypoglycemic episode.

THYROID DISORDERS.

Hypothyroidism

Insufficient thyroid hormone

1. Primary: thyroid gland failure
   - Iodine deficiency- most common cause worldwide
   - Congenital
   - Autoimmune mediated

- Hashimoto's thyroiditis- B lymphocytes invade thyroid
- Iatrogenic- post-thyroidectomy or radio-iodine treatment
- Drug-induced – Anti-thyroid, lithium, amiodarone
- Severe infection
- Trauma to thyroid/pituitary/hypothalamus
- Pituitary tumour

2. Secondary: pituitary gland failure
3. Tertiary: hypothalamus failure

Symptoms: tiredness and weakness, dry skin, feeling cold, hair loss, difficulty in concentrating and poor memory, constipation.

Signs: dry skin, cool extremities, puffy face, hands and feet, delayed tendon reflex relaxation, carpal tunnel syndrome, bradycardia, diffuse alopecia, serous cavity.

Investigations: TSH ↑, free T4 ↓

Ultrasound of thyroid – little value

Thyroid scintigraphy – little value

Anti thyroid antibodies – anti-TPO

S-CK ↑, s-Chol ↑, s-Trigliseride ↑

Normochromic or macrocytic anemia

ECG: Bradycardia with small QRS complexes.

Treatment: Levothyroxine

- If no residual thyroid function 1.5 μg/kg/day
- Patients under age 60, without cardiac disease can be started on 50 – 100 μg/day. Dose adjusted according to TSH levels
- In elderly especially those with CAD the starting dose should be much less (12.5 – 25 μg/day)

HYPERTHYROIDISM

Symptoms: hyperactivity/ irritability/ dysphoria, heat intolerance and sweating, palpitations, fatigue and weakness, weight loss with increase of appetite, diarrhoea, polyuria, oligomenorrhoea, loss of libido.

Signs: tachycardia (AF), tremor, goiter, warm moist skin, proximal muscle weakness, lid retraction or lag, gynecomastia.

Most common causes: Graves disease;

	Toxic multinodular goiter;
	Autonomously functioning nodule.
Rarer causes:	Thyroiditis or other causes of destruction
	Thyrotoxicosis factitia
	Iodine excess (Jod-Basedow phenomenon)
	Struma ovarii
	Secondary causes (TSH or ßHCG).

Graves' disease.

Autoimmune disorder

Abs directed against TSH receptor with intrinsic activity. Thyroid and fibroblasts

Responsible for 60-80% of Thyrotoxicosis

More common in women.

Diagnosis: TSH ↓, free T4 ↑

Thyroid auto antibodies

Nuclear thyroid scintigraphy (I123, Te99)

Treatment: Reduce thyroid hormone production or reduce the amount of thyroid tissue Antithyroid drugs: propyl-thiouracil, carbimazole.

Subtotal thyroidectomy – relapse after antithyroid therapy, pregnancy, young people, Smptomatic treatment – Propranolol.

Thyroiditis.

Acute: rare and due to suppurative infection of the thyroid. Bacterial – Staph, Strep

Fungal – Aspergillus, Candida, Histoplasma, Pneumocystis

Radiation thyroiditis

Amiodarone (acute/ sub acute)

Painful thyroid, ESR usually elevated, thyroid function normal

Sub acute: also termed de Quervains thyroiditis/ granulomatous thyroiditis – mostly viral origin. Viral (granulomatous) – Mumps, coxsackie, influenza, adeno and echoviruses

Mostly affects middle aged women, Three phases, painful enlarged thyroid, usually complete resolution

Rx: NSAIDS and glucocorticoids if necessary. Silent thyroiditis

No tenderness of thyroid

Occur mostly 3 – 6 months after pregnancy

3 phases: hyper –» hypo –» resolution, last 12 .o 20 weeks

ESR normal, TPO Abs present

Usually no treatment necessary

Chronic thyroiditis: mostly autoimmune (Hashimoto's)

ESOPHAGEAL AND GASTRIC DISORDERS

DYSPHAGIA

Definitions

Dysphagia is primarily a swallowing disorder. It is manifested by the difficulty or inability of swallowing, pain at the time of ingestion, ingestion of food or fluid in the nose, throat, trachea. Dysphagia may be mechanical (peripherally-organic) and motor (neurogenic). Dysphagia is a symptom that may be one of the signs of esophageal cancer.

Achalasia

Cardiospasm (achalasia of the esophagus, cardiac achalasia, idiopathic esophagoplasty, megoesophagus) is a disease caused by spasm of the esophagus muscle, as well as its insufficient expansion in swallowing food. Characterized by a violation of the passage of food from the esophagus to the stomach, occurs more often in middle-aged people. It manifests itself with retroactive pain, dysphagia, and regurgitation in the form of alterations of saliva, mucus and residual food from the esophagus.

Cardiospasm is a lesion of the neuromuscular apparatus of the esophagus and cardia accompanied by:

- atony, expanding of the esophagus,
- violation of the cardia opening by swallowing,
- evacuation of food from the esophagus into the stomach,
- prolonged fasting of food in the esophagus.

Diagnostics

In the initial stage of the disease, the diagnosis can be clarified using esophagoscopy, esophagomanometry. Differential diagnosis is done with cancer of the cardiac department of the esophagus. In X-ray examination, when the achalasia of the wall of the esophagus is smooth, unlike cancer. Dysphagia and esophagus changes can occur relatively early in systemic scleroderma, preceding other manifestations of the disease.

Treatment

A frequent meal with slow, thorough washing. From spasmolytic drugs appoint Papaverine, Atropine, Raglan. Sometimes, at the moment of spasm, the relief brings nitroglycerin or a few sips of warm water. Surgical treatment methods like Heller myotomy, Endoscopic myotomy are used.

DYSPEPSIA ("INDIGESTION")

Definition

Dyspepsia is a collective term that includes a group of functional digestive disorders that should be considered in clinical practice as syndromes, in which processes of enzymatic processing of protein or carbohydrate foods are violated. *The syndrome of dyspepsia includes the following symptoms:*

- Pain located in the epigastric (epigastric) region.
- The inconveniences located in the epigastric (epigastric) region.
- Early saturation.
- The sensation that the stomach is full immediately after the start of the meal, regardless of the volume of food taken.
- Overflow.
- An unpleasant sensation of food delay in the stomach, it may or may not be related to eating.
- Inflammation in the epigastric region.
- Feeling of bursting in the epigastric region, which should be distinguished from a visible bloating.
- Nausea [13].

Symptoms of dyspepsia can be caused by diseases such as peptic ulcer, gastroesophageal reflux disease, cholelithiasis, chronic pancreatitis. In such cases it is customary to talk about the syndrome of ***organic dyspepsia***.

But, if a careful examination of the above diseases can not be identified, it is legitimate to diagnose ***functional dyspepsia***.

Functional dyspepsia	Symptoms and signs	Treatment
Ulcer alike type	Patients have pain in the epigastric region (often nocturnal and hungry), after eating food and antacids	Antacids Antisecretory drugs Helicobacter pylori eradication therapy
Dyskinetic type	Patients are dominated by complaints of early satiety, a feeling of overflow in the epigastric region after eating, nausea, a sensation of bloating in the epigastrium, and discomfort after eating.	Prokinetics - drugs that normalize the motor activity of the gastrointestinal tract
Nonspecific variant	Complaints of the patient can be difficult to assign to a particular group.	Prokinetics Antacids

PEPTIC ULCER DISEASE (PUD)

Peptic ulcer - a benign defect of the mucous membrane of the stomach and duodenum that goes beyond its borders and arises as a result of inconsistency of the factors of "protection" and "aggression" in the mucous membrane of the gastroduodenal zone.

Factors of the 1 st group (protection) include: mucus, produced by the mucous membrane of the stomach, this mucus prevents the reverse diffusion of protons to the mucosa.

Factors of the second group (aggression) include: gastric juice (containing hydrochloric acid and pepsin - an enzyme that digests protein compounds), which is an aggressive agent for cells and the infectious factor - the Helicobacter pylori microbe (in case of infection with it).

Symptoms. Pain in the epigastric region is the main symptom of the ulcer. With the localization of ulcers in the stomach, pain usually occurs after eating, with the localization of ulcers in the duodenum, on the contrary, there are so-called "hunger pains" in which pain occurs on an empty stomach, and eating brings relief of pain.

Other symptoms of peptic ulcer may include:

- sour belch or heartburn;
- decreased body weight;
- vomiting and nausea after eating [14].

Diagnostic studies

Clinical blood test.

Analysis of feces for latent blood. The study of the acid-forming function of the stomach, which is carried out with the help of pH-metry (in recent years - using daily monitoring of intragastric pH). With ulcers of the body of the stomach and the subcardial department, normal or decreased values of acid production are usually noted.

X-ray method of investigation. When X-ray examination with double tight contrast barium, there is a direct sign of peptic ulcer - a "niche" on the contour or on the mucosal relief and indirect signs of the disease.

Endoscopic method of research. The most informative in the diagnosis of peptic ulcer of the stomach and duodenum is an endoscopic examination that visually confirms the presence of a ulcerative defect, allows us to clarify its localization,

depth, shape, size, allows us to assess the condition of the bottom and edges of the ulcer, to identify concomitant changes in the mucosa.

A biopsy followed by a histological examination of the resulting material.

This study makes it possible to exclude the malignant nature of ulcerative lesions.

Studies of the presence in the gastric mucosa of Helicobacter pylori.

Electrogastroenterography and anthroduodenal manometry - allow to identify violations of gastroduodenal motor skills.

Treatment

Helicobacter pylori eradication protocols

Three-component therapy, was proposed at the first Maastricht conference and became a universal treatment regimen for H. pylori infection. It is recommended by all world conciliation conferences. The scheme includes preparations:

one of the proton pump inhibitors (IPN) in the "standard dosage" (omeprazole 20 mg, lansoprazole 30 mg, pantoprazole 40 mg, esomeprazole 20 mg, or rabeprazole 20 mg 2 times a day) for at least 7 days

clarithromycin (500 mg twice daily) 7 days

amoxicillin (1000 mg twice daily) or metronidazole (500 mg twice daily) for 7 days.

It was shown that the IPN + clarithromycin + metronidazole (tinidazole) and IPN + clarithromycin + amoxicillin regimens are equivalent. It has been established that the effectiveness of triple therapy increases with an increase in its duration to 10 or 14 days (depending on the degree of colonization of Helicobacter pylori and the tolerability of therapy by the patient)

Comparison of *Helicobacter pylori* eradication regimens

Regimen	Duration, days	Drugs used	Notes
Triple therapy	7–14	PPI (standard dose) bid, amoxicillin 1 g bid and clarithromycin 0.5 g bid	First line therapy in areas with low clarithromycin resistance
Sequential therapy	10	1st 5 days: PPI (standard dose) bid and amoxicillin 1 g bid 2nd 5 days: metronidazole 0.5 g bid and clarithromycin0.5 g bid	First line therapy
Concomitant therapy	7–10	PPI (standard dose bid), amoxicillin 1 g bid, metronidazole 0.5 g bid and clarithromycin 0.5 g bid	First line therapy
Hybrid therapy	14	1st week: PPI (standard dose) and amoxicillin 1 g bid 2nd week: PPI (standard dose), amoxicillin 1 g, metronidazole 0.5 g	First line therapy

		and clarithromycin 0.5 g bid	
Bismuth-containing quadruple therapy	10–14	PPI (standard dose) bid, tetracycline 0.5 g qid, metronidazole 0.25 g qid and bismuth standard dose qid	First line or second line therapy
Levofloxacin-based triple therapy	10	PPI (standard dose) bid, levofloxacin 0.5 g qid and amoxicillin 1 g bid	Second line therapy if there is no fluoroquinolone resistance
Levofloxacin-based quadruple therapy	10	PPI (standard dose) bid, bismuth standard dose qid and two antibiotics selected by sensitivity tests	Third line therapy if there is no fluoroquinolone resistance
Culture-guided therapy	10	PPI (standard dose) bid, bismuth standard dose qid, levofloxacin 0.5 g qid and amoxicillin 1 g bid	Third line therapy
High-dose dual PPI therapy	14	PPI (high dose) qid and amoxicillin 0.5 g qid	Third line therapy
Rifabutin triple therapy	14	PPI (standard dose) bid, rifabutin 0.15 g bid and amoxicillin 1 g bid	Third line therapy

[15].

DIARRHEA, CONSTIPATION AND ILEUS

ACUTE DIARRHEA (<4 wk)

Diarrhea is a pathological condition, a clinical symptom in which unformulated or fluid excrement occurs three or more times a day (or more often than usually for a particular person). Frequent feces are not diarrhea. Unformed, "paste-like" defecation in breastfeeding children is also not considered as diarrhea.

Diarrhea develops, mainly as a result of the consumption of contaminated food and water. About 780 million people around the world do not have access to clean water and 2.5 billion people have no access to basic sanitation. WHO is currently considering three clinical types of diarrhea:

- acute watery diarrhea - lasts for several hours or days;
- acute bloody diarrhea;
- persistent diarrhea - lasts 14 or more days.

The most common cause of acute diarrhea is infectious agents. Diarrhea is usually caused by viruses, bacteria, and, at times, the simplest, toxins of bacteria. The diarrhea that arises from tourists visiting exotic countries is called "diarrhea of travelers". In addition, diarrhea may be caused by non-infectious factors - some poisoning (heavy metal salts, mushrooms, etc.), medicines, food intolerance, etc.

• **Laboratory**: fecal WBC; fecal calprotectin or lactoferrin Se/Sp>90%), ± stool ELISAs (viruses, *Crypto*, *Giardia*), serologies (*E. histolytica*), special stool cx [14].

Treatment

The main measures for the treatment of diarrhea include the following:

Rehydration with a solution of oral rehydration salts of a mixture of pure water, salts and sucrose. After ingestion, they are absorbed in the small intestine and replace the water and electrolytes that have been removed from the body with diarrhea. Oral rehydration salts exist as prescription drugs for the preparation of the necessary solution immediately before use, but in the absence of the prescription drug, the oral rehydration salts can be prepared at home.

Hydration via parenteral (intravenous or other) administration of solutions in the case of moderate dehydration with vomiting predominant and not stopped by medication, severe dehydration or dehydration shock.

Food products rich in nutrients. The closed circle of nutritional deficiencies in children and diarrhea can be terminated by feeding them with foods rich in nutrients (including breast milk), such as during diarrhea. as well as with the subsequent feeding of children who have recovered with nutritional products (including exclusive breastfeeding of children during the first six months of life) [15].

COLORECTAL CANCER (CRC)

Colorectal cancer is a malignant tumor of the large intestine and rectum in humans, derived from epithelial cells, lining the inner surface of the colon and rectum. CRP is one of the most common malignant tumors, ranked 3rd in frequency after lung cancer, prostate cancer or breast cancer, depending on the gender of the patient [14].

Diagnosis

Depending on the cancer location and the metastatic spread of the tumor, various symptoms may be observed. ***The classic symptoms are:*** constipation, blood and / or mucus in the stool, stool reduction, loss of appetite, weight loss, nausea, vomiting. Also, rectal bleeding or anemia are frequent signs of colorectal cancer especially in patients over the age of 50 years, and other symptoms, including

weight loss and digestive disorders, are often associated with the presence of this pathological phenomenon.

Endoscopic examination methods are used for knee diarrhea: colonoscopy and recto-mandibular microscopy, during which the endoscopist doctor determines the suspicious formation of the large intestine. During an endoscopic examination, a biopsy of a suspected CVD with biopsy pathophysiology is performed. The less sensitive method is the passage of barium with subsequent X-ray examination of the large intestine. Computer tomography, MRI and PET are used when suspected of having remote CRD metastases.

• **Biochemical fecal testing**

Occult blood (FOBT): ↓ mortality; 3 card home testing more Se (24% vs. 5%) than DRE/FOBT. Repeat q1y.

Immunohisto for Hb: Se ~35% & ~80% for adv neoplasia & CRC

DNA: ↑ Se, Sp c/w FOBT, but less Se

TASKS FOR FINAL CONTROL

Task 1. The patient of 53 years old complained the feeling of heaviness in epigastric area, periodic nausea, annoying taste into mouth, unsteady stool, loosing of the weight, and decreased appetite. He was ill during 7 years, self-treated. Worsening was during two weeks. Clinical exam: moist skin; no peripheral lymphatic nodes,nonsignificant painful palpation of epigastric area.

1.1. What is the likely diagnosis:

A. gastric dyspepsia

B. chronic nonatrophic gastritis, normoacid state

C. stomach cancer

D. chronic atrophic gastritis, hypoacid state

E. chronic atrophic gastritis, nonacid state

1.2. In accordance with this diagnosis specify the reliable changes which can be on X-rayof stomach for this patient:

A. smoothing of plica, shortening and narrowing of antral part, no peristalsis in this area.

B. normal plica, evacuation is speed-up

C. smoothing of plica, evacuation low-spirited, pylorus to hiatus.

D. in the antral part smoothing of plica, uneven tumor

E. thickening of plica, normal peristalsis

1.3. Which laboratory tests must be done:

A. activity of pancreatic enzymes

B. reaction of Gregersen

C. blood gastrin level

D. antibodies to the lamblias

E. H. pylori infection

1.4. Define a treatment plan:

A. perform abdominal computer tomography

B. work-up with further medicinal treatment

C. work-up with further appointment of specialist

D. out-patient symptomatic treatment, work-up

E. surgery

Task 2. The most typical pathology of kidneys in the case of diabetes mellitus:

A. Chronic pyelonephritis
B. renal amyloidosis
C. glomerulosclerosis
D. glomerulonephritis
E. all of mentioned above

Task 3. Which of the following statements is inaccurate regarding the pharmacologic therapy of type 2 diabetes?

A. Early initiation of pharmacologic therapy is associated with improved glycemic control and reduced long-term complications
B. to incorporate obesity, prediabetes, and cardiovascular risk factor management
C. Lifestyle modification, including weight loss
D. an HbA1c of 7,5% or lower as the goal for most patients
E. an HbA1c of 6,5% or lower for healthy patients without concurrent illness and at low risk for hypoglycemia

Task 4. Which of the following statements is inaccurate about dietary modifications for diabetes patients?

A. Modest restriction of saturated fats and simple sugars
B. Caloric restriction is of first importance
C. a diet composed of foods that are within the financial reach and cultural milieu of the patient
D. dietary modifications is not reasonable
E. individual preference of patient is reasonable

Task 5. Which of the following statements is inaccurate about physical activity for diabetes patients?

A. Aerobic exercise improves insulin sensitivity and may improve glycemia markedly in some patients
B. Structured exercise training of more than 150 minutes per week is associated with greater HbA1c reduction
C. physical activity helps lower HbA1c without dietary modifications
D. A previously sedentary patient should start activities slowly
E. exercise training did not improve conduit arterial elasticity

Task 6. Monitoring for Diabetic Complicationsshould include yearly examinations:

A. for dilated eye examinations
B. for dilated eye examinations, annual microalbumin checks, and foot examinations at each visit
C. for the development of geriatric conditions at a younger age than was previously considered
D. for pancreatic neoplasm
E. for development of Parkinson disease

Task 7. Which of the following statements is inaccurate about preventive metformin therapy for diabetes patients?

A. Obesity
B. Age younger than 60 years
C. Both impaired fasting glucose and impaired glucose tolerance

D. Other risk factors (eg, HbA1C >6%, hypertension, low HDL cholesterol, elevated triglycerides, or a family history of diabetes in a first-degree relative)
E. BMI less than 25

Task 8. Which of the following statements is inaccurate about the primary prevention of stroke for diabetes patients?

A. Regular blood pressure screening, Physical activity (30 minutes or more of moderate-intensity activity on a daily basis)
B. A low-sodium, high-potassium diet to reduce blood pressure; a diet emphasizing consumption of fruits, vegetables, and low-fat dairy products
C. A blood pressure goal of less than 130/80 mm Hg, Drug therapy with ACE inhibitors or ARBs
D. aspirin therapy
E. Statin therapy, especially in patients with other risk factors; monotherapy with fibrates may also be considered to lower stroke risk.

Task 9. Which of the following statements is inaccurate about the prevention of type 2 diabetes mellitus in patients at risk?

A. Weight reduction
B. Proper nutrition
C. no physical activity modification
D. Cardiovascular risk factor reduction
E. Aggressive treatment of hypertension and dyslipidemia

Task 10. The 37-years-old patient complains for steady pain in the right epigastric area, with back spreading, nausea, and vomit. He had gastric ulcer during 15 years, he was self-treated irregularly. Physical examination: pale, moisture skin; furred tongue, wooden belly, painful abdominal palpation of pyloroduodenic area, «+» Mendel's, Obrazcov's symptoms. Complete blood count: neutrophilic leukocytosis, erythrocyte sedimentation rate 28 mm/hour. Negative Gregersen's reaction. X-ray: the stratified niche 0,8x 1,2 cm with inflammatory wall to 7 mm was in duodenal cap.

1.1. Gregersen's reaction is:

A. determination of H. pylory
B. blood pancreatic enzymes test
C. the urine occult blood test
D. fecal occult blood test
E. urine pancreatic enzymes test

10.2. You diagnosed:

A. duodenal ulcer, exacerbation, severe clinical course, gastrorrhagia
B. cancer of stomach with tumour transformation
C. duodenal ulcer, exacerbation; chronic superficial gastritis
D. duodenal ulcer, associated with H. pylory, exacerbation
E. duodenal ulcer, exacerbation, severe clinical course with penetration ulcer

10.3. Your management program of patient:

A. day hospital treatment
B. planned hospitalization in therapeutic department
C. urgent hospitalization in surgical department
D. planned hospitalization in surgical department
E. out-patient treatment

Answers:

1.1	1.2	1.3	1.4	2	3	4	
D	**C**	**C**	**B**	**C**	**D**	**D**	
5	6	7	8	9	10.1	10.2	10.3
C	**B**	**E**	**D**	**C**	**D**	**E**	**C**

TOPIC 7
THE ORGANIZATION OF EMERGENCY IN THE PRACTICE OF FD. THE EMERGENCY IN THE CASE OF SUDDEN DEATH, SEIZURE, LOSS OF CONSCIOUSNESS ON THE PRE-ADMISSION STAGE

I. Theme actuality. Emergency has great importance for treatment and diagnosis recovering at the pre-admission stage. At the same time family doctor always faces a problem: what is better - either to give maximum necessary scope of emergency on the site of the incident or to admit the patient to the nearest hospital as soon as possible. According to expert data there is only one decision of this problem. This means give necessary scope of emergency in a short-run and then to admit to specialized hospital. Stabilization of patient's vital functions is the criteria of emergency scope in the place of the incident. Fundamental factors are timeliness of emergency on the site of the incident, vocational training of a specialist and sufficient medical provision. The vast majority of naturally occurring sudden deaths are caused by cardiac disorders. The magnitude of the problem of cardiac causes is highlighted by estimates that more than 300,000 sudden cardiac deaths (SCD) occur each year in the U.S. An exception is unwitnessed deaths in which pathologists may expand the definition of time to 24 h after the victim was last seen to be alive and stable.

II. Study purposes: to be able to detect the first signs of loss of consciousness, to propose a plan of examination and treatment of patients with seizure and loss of consciousness.

III. Concrete purposes of the module: emergency in the case of sudden death, seizure or loss of consciousness.

IV. A student must be able:

- to estimate general state of the patient;
- to acquire skills of clinical examination of the patients with sudden death, seizure and loss of consciousness;
- to diagnose the state of the patient on the basis of patient complaints, medical history, degree of consciousness impairment and data of clinical examination;
- to define a plan for examination of patient with loss of consciousness;
- to estimate vital functions;

- to integrate data of clinical examination and laboratory data.

V. Task for initial independent training

1. The status of patient when his speech and thoughts become slow, his attention is distracted; there is fatigue, drowsiness and lack of perception and evaluation of what is happening:

A. Clear consciousness.
B. Obtundation.
C. Sopor.
D. Coma.
E. Syncope.

2. The status of patient when his mental state is depressed. After repeated appeal to the patient he opens his eyes but there is no contact with him:

A. Clear consciousness.
B. Obtundation.
C. Sopor.
D. Coma.
E. Syncope.

3. The status of patient when a dead faint and non-responsiveness to external irritants are observed:

A. Clear consciousness.
B. Obtundation.
C. Sopor.
D. Coma.
E. Syncope.

4. Short-time loss of consciousness which is accompanied by loss of postural tone and caused by temporary inadequate blood supply to brain is:

A. Clear consciousness.
B. Obtundation.
C. Sopor.
D. Coma.
E. Syncope.

5. Most important criterion of coma severity is:

A. Dead faint.

B. Non-responsiveness to external stimuli.

C. Two-sided fixed mydriasis.

D. Areflexia.

E. Reduced muscle tone.

6. During cardiopulmonary resuscitation the electrical defibrillation is shown by:

A. Izoline

B. Irregular waves

C. Nodal rhythm

D. Always circulatory arrest

E. Sinus bradycardia

7. Asystole is the same as:

A. Absence of systolic blood pressure

B. Collapse

C. Complete atrioventricular heart block

D. Cardiac arrest

E. Syncope

8. What is the most frequent complication of resuscitation in elderly patients?

A. Hepatorrhexis

B. Spine Fractures

C. Gaps lung

D. Jawfall

E. Fractures of ribs and sternum

9. More often sudden death occurs as a result:

A. Asystole

B. Development of atrioventricular dissociation

C. Ventricular fibrillation

D. Atrial fibrillation

E. Ventricular tachycardia

10. Identify the share of cases without morphologic signs in heart in the case of sudden death

A. 5-7%

B. 10-15%

C. 20-26%

D. 12%

E. 20%

Answers:

1	2	3	4	5	6	7	8	9	10
B	**C**	**D**	**E**	**C**	**B**	**D**	**E**	**C**	**D**

XI. Basic questions after theme

1. The causes of sudden death.
2. The electrophysiological types of cardiac arrest.
3. The emergency in the case of cardiac arrest.
4. The emergency in the case of primary breathing standstill.
5. The emergency in the case of traumatic death.
6. The emergency in the case of acute coronary syndrome on the pre-admission stage.
7. Classification of seizure.
8. The first aid in case of generalized seizure.
9. The cause of loss of consciousness.
10. First aid in the case of loss of consciousness.
11. The role of FD in the emergency treatment.
12. The sudden death rate in the morbidity structure.
13. The electrophysiological types of cardiac arrest. The diagnostics of type of cardiac arrest (ECG).

VII. Practical skills: – tests and tasks

IX. The content of theme

CARDIAC ARREST AND SUDDEN CARDIAC DEATH.

Sudden cardiac death is a sudden death, due to the discontinuation of the functioning of the heart (sudden cardiac arrest). In the US, it is one of the main causes of natural death, taking about 325,000 adult lives each year, and accounting for half of all deaths from cardiovascular diseases.

Sudden coronary death most often occurs between the ages of 35 and 45 years and is twice as likely to affect men. It is rare in childhood and occurs in 1-2 out of 100,000 children every year.Young and middle-aged men and women have very different susceptibilities to SCD, but the gender differences decrease with advancing age [11].

Term	Definition	Qualifiers or Exeptoins
Death	Irreversible cessation of all biologic functions	None
Cardiac arrest	Abrupt cessation of cardiac pump function which may be reversible by a prompt intervention but will lead to death in its absence	Rare spontaneous reversions; likelihood of successful interventions; relates to mechanism of arrest and clinical setting
Cardiovascular collapse	A sudden loss of effective blood flow due to cardiac and/or peripheral vascular factors which may reverse spontaneously (e.g., neuro-cardiogenic syncope; vasovagal syncope) or only with interventions (e.g., cardiac arrest)	Nonspecific term which includes cardiac arrest and its consequences and also events which characteristically revert spontaneously

There are many ***risk factors*** that increase the likelihood of a person developing sudden cardiac arrest and sudden coronary death, among them:

- A previous heart attack with a large area of myocardial damage (75% of sudden coronary deaths are associated with a previous myocardial infarction).
- In the first six months after acute myocardial infarction, the risk of sudden coronary death was increased.
- Ischemic heart disease (80% of sudden coronary deaths are associated with this disease).

- Risk factors for the development of coronary heart disease are smoking, cardiovascular disease in a family history and elevated cholesterol.
- Other risk factors are:

- The ejection fraction is less than 40% in combination with ventricular tachycardia.
- Preceding episodes of sudden cardiac arrest.
- Cases of sudden cardiac arrest or sudden coronary death in a family history.
- The presence in the personal or family history of cardiac rhythm disturbances, including short or extended QT interval syndrome, Wolff-Parkinson-White syndrome, too low heart rate or heart block.
- Ventricular tachycardia or ventricular fibrillation that develop after a heart attack.
- Congenital heart defects and blood vessel abnormalities.
- Episodes of syncope (loss of consciousness of an uncertain cause).
- Heart failure: a condition in which the pumping function of the heart is weakened. In patients with heart failure, the risk of developing ventricular arrhythmias that can lead to sudden cardiac arrest is 6-9 times higher.
- Dilated cardiomyopathy (causes sudden coronary death in 10% of cases), due to a decrease in pumping function of the heart.
- Hypertrophic cardiomyopathy: thickening of the heart muscle, especially in the area of the ventricles.
- Significant changes in the level of potassium and magnesium blood (for example, using diuretics), even in the absence of any heart disease.
- Obesity.
- Diabetes.
- Drug use.
- Taking anti-arrhythmic drugs may increase the risk of life-threatening arrhythmias.

Clinical characteristics of cardiac arrest

Sudden coronary death has pronounced symptoms:

- ✓ The heart stops contracting, and the blood does not pumped through the body;
- ✓ almost immediately there is a loss of consciousness;
- ✓ the patients falls down;
- ✓ there is no pulse;
- ✓ there is no breath;
- ✓ dilatated pupils.

These symptoms indicate a stop of cardiac activity. The main ones are lack of pulse and breathing, dilated pupils. All these signs can be detected by a nearby person, since the patient himself is in a state of clinical death at this moment.

Clinical death is a period of time that lasts from cardiac arrest to the onset of irreversible changes in the body, after which the revitalization of the victim is no longer possible.

Before the heart stops, some patients may feel precursors, which include a sharp heart rate and dizziness.

Treatment. Management of patients who sufferes sudden cardiac death consists four stages:

1) **Initial Response and Basic Life Support.**

Make sure in your and a patients safety.

Check the consciousness of the patient. To do this, gently shake his shoulder and ask how he feels. If the patient answers, leave him in the same position and call an ambulance. Do not leave the patients alone.

If the patient is unconscious and does not respond to treatment, turn it on his back. Then place the palm of one hand on his forehead and gently tilt his head back. With your fingers under your chin, push the lower jaw upward. These actions will open the airways.

Assess the presence of normal breathing. For this, lean towards the patient's face and look at the movements of the chest, feel the movement of air on your cheek and listen to the sound of breathing. One should not confuse normal breathing with death sighs, which can be observed during the first moments after cessation of cardiac activity.

If a person breathes normally, call an ambulance and watch the patients before it arrives.

If the patient does not breathe or his breathing is abnormal, call for an ambulance and begin holding a closed heart massage. For proper execution, place one hand on the center of the sternum so that only the base of the palm touches the chest. Place the other palm on top of the first one. Holding your arms straight at the elbows, press on the victim's chest so that the depth of its deflection is 5-6 cm. After each pressure (compression), allow the chest to fully straighten. It is necessary to carry out a closed heart massage with a frequency of 100-120 compressions per minute [16].

- mouth-to-mouth respiration may be used if no specific rescue equipment is immediately available
- to continue CPR before breathing in the patient, his movements, eye opener; to EMD brigade arrival; before the onset of physical the exhaustion of the person who is resuscitating;
- In the case of a patient's resuscitation - translate it into a stable position
- on the side and wait for the arrival of the EMD brigade, while constantly monitoring the presence of respiration (checking pulse is mandatory only for medical staff);
- Do not leave the patient unattended [13].

2) Advanced Life Support is intended to achieve adequate ventilation, control cardiac arrhythmias, stabilize the hemodynamic status (BP and cardiac output), and restore organ perfusion. The activities carried out to achieve these goals include:

-intubation with an endotracheal tube

As soon as the intubated patient's trachea or an established reflux unit, chest compressions need to be restored and continued without interruption (with the exception of defibrillation and pulse test - if indicated), with a frequency of at least 100 minutes. and ventilate the lungs with a frequency of about 10 breaths (every 5 seconds) asynchronously. If, however, it is not possible to provide adequate oxygenation, thus - it is necessary to pause the compresses for ventilation.

When using mechanical ventilation devices, it is first necessary to set the respiratory volume at the level of 6-7 ml per kg of body weight (at 10 breaths per minute), then titrate to Pa02

When using mechanical ventilation devices, it is first necessary to set the respiratory volume at the level of 6-7 ml per kg of body weight (at 10 breaths per minute), then titrate to $Pa0_2$

-defibrillation/cardioversion and/or pacing

The automatic external defibrillator independently determines the required discharge energy. In the sphygmic biphasic defibrillator, the energy of the first and second defibrillations is exposed at the level indicated by the manufacturer of the particular device, the third and all subsequent defibrillations are made with the maximum available energy. In the presence of a monophasic defibrillator, since the first defibrillation, the maximum discharge energy is exposed.

If defibrillation was restored to a normal rhythm, which again went into the rhythm that needs to be defibrillated, they put the discharge in energy, which for the first time restored normal rhythm. If it is ineffective - it increases energy.

-insertion of an intravenous line

Epinephrine

Epinephrine increases myocardial excitability and therefore is a potentially arrhythmogenic substance, especially in conditions of myocardial ischemia or hypoxia. After resuscitation, epinephrine can cause re-ventricular fibrillation.

Epinephrine is most commonly available in two concentrations: 1 to 1000 (1 ml-1 mg epinephrine) for parenteral administration; 1 to 10,000 (10 ml-1 mg epinephrine) for external use. In the case of treatment with epinephrine at a concentration of 1 mg, victims with defibrillation rhythms of FS / SS without pulse. It is administered after 3 defibrillations, then every 3-5 minutes. Due to one defibrillation). In the treatment of non-defibrillation rhythms, asystole / pulse-free electrical activity - 1 mg of epinephrine as soon as it is performed intravenous (intra-bone) access, and then every 3-5 min. during the entire time of resuscitation.

Amiodarone

Amiodarone is a anti-arrhythmic drug that stabilizes cell membranes, extends the duration of functional capacity and the refraction time of cardiomyocytes of the atria and ventricles. Slows down atrial-ventricular conduction; This effect is also observed in additional pathways. Amiodarone has a negative isotropic effect and the cause is the expansion of peripheral vessels through noncompetitive blockade of α-receptors.

If FS / FS is maintained after the third defibrillation, it is necessary enter the initial dose of amiodarone 300 mg / in (or in / k), dissolved in 20 ml-5% glucose (which will reduce the foaming of the drug in the syringe). An additional dose of amiodarone in 150 mg can be administered with relapsing persistent FS / ST.

Lidocaine

Lidocaine is an anti-arrhythmic drug that stabilizes the membrane and acts by prolonging the reflux time of myocytes. Reduces ventricular vomiting and reduces their ectopic activity. Reduces the activity of depolarized arrhythmogenic tissues, while minimally affecting the electrical activity of normal tissues. In the absence of amiodarone, lidocaine may be used in the initial dose of 100 mg (1-1.5 mg / kg) in the case of FS / MS without pulse, resistant to three times multiple defibrillation. If necessary, you can additionally enter painful 50 mg. The total dose should not exceed 3 mg / kg during the first hour of treatment.

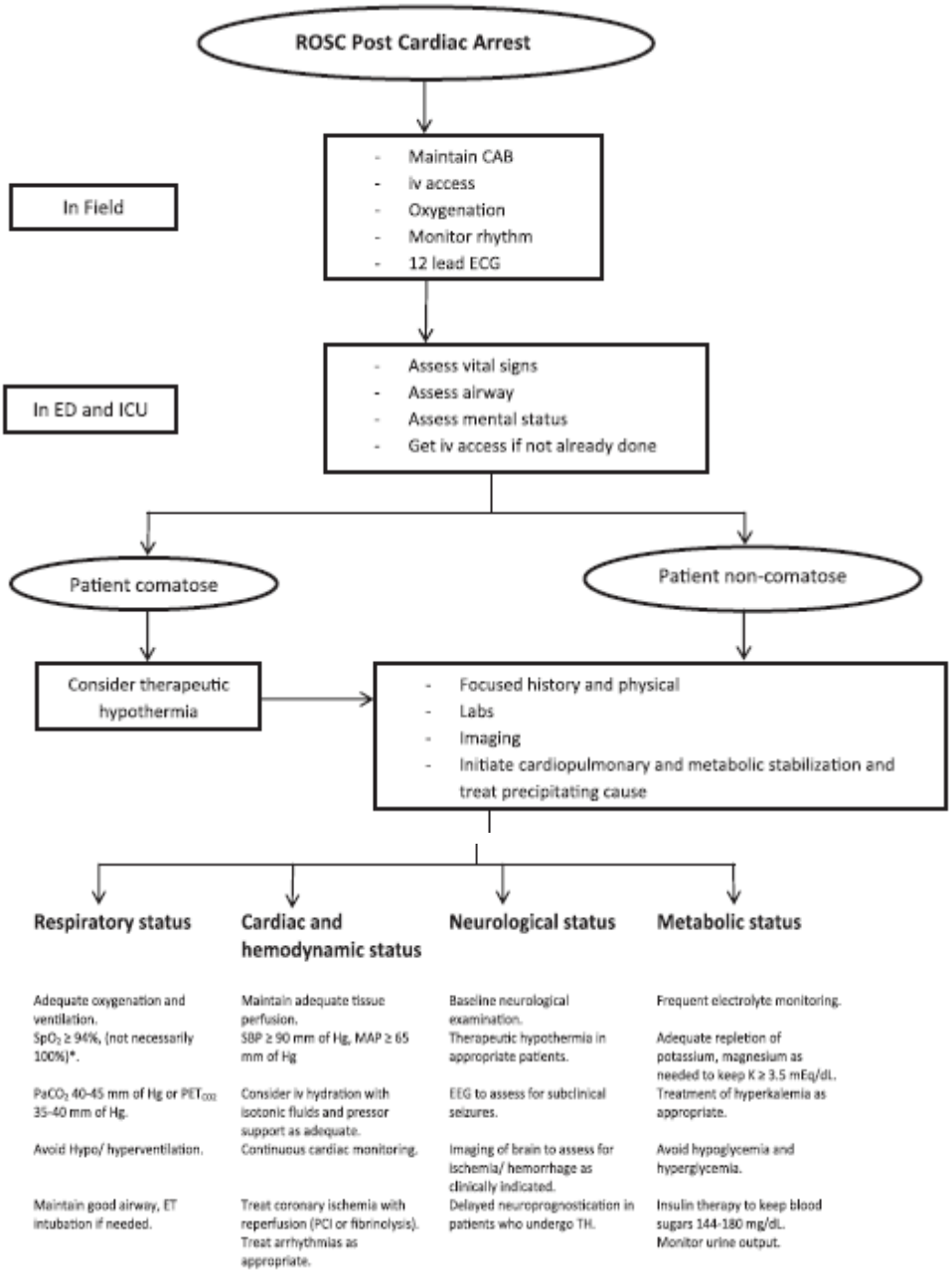
Sodium hydrocarbonate

Routine use of sodium hydrogen carbonate during CPR is not recommended. Sodium bicarbonate sodium (50 mmol) is recommended for cardiac arrest at the background of hypercalemia or poisoning with tricyclic antidepressants. Repeated doses are administered by clinical indication or re-analysis of blood gases [16].

3) Postresuscitation Care

The most important measure to prevent re-arrest is identifying and treating the etiology of initial arrest. If any further episodes of CA occur while the patient is being monitored, then they should be treated with CPR, defibrillation, vasopressors and antiarrhythmic therapy as appropriate.

At this time evidence is insufficient to routinely recommend or refute using antiarrhythmic agents prophylactically. Post-CA, it is essential tomaintain perfusion to vital organs to prevent further clinical deterioration. Irrespective of the etiology of arrest, there may be temporary myocardial dysfunction and inability to maintain adequate cardiac output.22,23 For optimal organ perfusion a MAP 65 mm of Hg should be targeted. The first step in ensuring this is adequate volume resuscitation with isotonic fluids to achieve a central venous pressure of 8e12 cm of H2O. Cold saline may be used for volume loading if TH is being considered. If, after adequate volume supplementation (usually 2e3 L of isotonic fluids), the MAP remains <60e65 mm of Hg; vasopressors and inotropic agents should be added.



Algorithm highlighting the important pathways involved in caring for a patient with ROSC post-cardiac arrest. ROSC return of spontaneous circulation; CAB circulation, airway, breathing; ECG and electrocardiogram; iv e intravenous, SBP systolic blood pressure; MAP mean arterial pressure; PCI percutaneous coronary intervention; ETe endotracheal; K potassium; Emergency Department, ICU and intensive care unit. *Can hold FIO2 of 100% in case of carbon monoxide or cyanide poisoning.

VESSELS AND LOSS OF CONFORMITY

Cramps - sudden spontaneous attacks of tonic-clonic contractions of skeletal muscles, which are often accompanied by loss of consciousness.

Seizures syndromes of origin are divided into epileptic and non-epileptic (symptomatic convulsive attacks) that are secondary, but can later be transformed into epileptic seizures. For the most part, seizures are manifestations of epileptic seizures [2].

Algorithm for emergency care at the pre-hospital stage in case of convulsive syndrome in children:

1. To enter tranquilizers: benzodiazepine (sibazon, relanium, seduxen) -0,5% solution of intramuscularly at the rate of 0,3-0,5 mg / kg. In the absence of the effect, repeat the administration every 10-15 minutes three times. You can administer tranquilizers through the rectum, using a catheter attached to a syringe (0.5 mg / kg in the first year of life, 2.5-5 mg in the age of 1 -3 years, 5-7.5 mg in Z -6 years, 7.5-10 mg at school age, in case of ineffectiveness, repeat administration 10-15 minutes).

2. Dehydration therapy: lasix 2-3 mg intramuscularly or intravenously.

3. If possible - inhale oxygen through a nasal catheter or mask.

4. Hospitalization to the neurological department, in case of disturbance of vital functions - to the department of intensive care and intensive care [9].

Epilepsy is a chronic brain disease of varying etiology, characterized by repeated epileptic seizures resulting from excessive neuronal discharges, and is accompanied by a variety of clinical and paraclinical symptoms.

An epileptic condition arises from prolonged epileptic seizures or attacks that occur at short intervals of time that are clinically characterized by progressive deterioration, the addition of respiratory, circulatory and metabolic disorders that increase, ultimately leading to the development of a coma state.

The provocative factors of epileptic seizures are as follows:

- drinking alcohol
- physical, mental fatigue,
- violation of regular use of anticoagulants.

Emergency algorithm in case of epileptic seizure

1. Prevention of mortality.

2. Relaxation breathing.

3. Prevention of tongue tongue: between angular teeth, it is recommended to insert a table spoon knob wrapped with cloth, or, if it is not, a small wooden object (it is unacceptable to insert metal objects, especially between the anterior teeth, as it can cause damage teeth and asphyxiation when they reach the upper respiratory tract).

4. After the end of the attack, the patient should not wake up and inject any medications [6,9].

Emergency algorithm in case of an epileptic condition

In view of the fact that the family outpatient clinic does not always have the necessary equipment, the family doctor's algorithm is as follows:

1. Ensure patency of the upper respiratory tract.
2. Removal of the possibility of tongue.
3. Intravenous slow injection of 2-4 ml of 0,5% solution of seduxen (if within 5-10 minutes the dose did not lead to the elimination of convulsive syndrome, it is necessary to re-enter this drug).
4. Ineffectiveness of repeated administration of seduxen is justified transitional barbiturates of ultra-short action: hexenal or thiopental-sodium (300-400 mg 1% intravenous infusion). These drugs have a depressant effect on the respiratory center and in the event of overdose it is possible to stop breathing (!).
5. Removal of signs of acute cardiovascular insufficiency is carried out by cardiac glycosides (for example, intravenous administration of 0.5-0.7 ml of 0.05% solution of strophantin or other drugs of this group) and vasoactive substances such as mesatone or norepinephrine hydrotartrate.
6. Removal of cerebral edema (osmodiuretics) [9].
7. Improvement of rheological properties of blood (low molecular weight dextran or heparin 2500-5000 OD subcutaneous or intramuscular 2-4 times a day).
8. Administration of antihypoxants (drugs like GHB).
9. At the first opportunity, it is necessary to transfer a patient with mechanical ventilation with the introduction of muscle relaxants [2].

Synoplasm states are states characterized by spontaneously arising transient loss of consciousness and translational tone due to cerebral hypoperfusion with subsequent spontaneous recovery.

Fainting, or syncope (from the grub soukkor - clamping, contraction), is clinically characterized by generalized muscle weakness, decreased postural tone,

arterial pressure and loss of consciousness. The most common cause is a decrease in blood flow in the brain, brain centers.

Coma (from the grub cat - deep sleep) - complete loss of consciousness and orientation with manifestations of neurological and autonomic disorders. The duration of the coma depends on the degree of violations [9].

Algorithm for emergency care during fainting

1. It is necessary to take measures aimed at improving blood supply and oxygenation of the brain:

- eliminate provocative factors;
- transfer the patient to the horizontal position;
- give your feet an elevated position;
- provide fresh air access;
- release from compression clothes;
- conduct a light massage of the body;
- provide reflex effect on the centers of respiration and cardiovascular regulation (inhalation of vapors of ammonia, scrubbing the face with cold water);
- turn the head to the side (prophylaxis of tongue tongue) with confidence in the absence of damage to the subclavian and carotid arteries.

2. In the absence of the effect of the measures taken and with a pronounced reduction of arterial pressure:

- introduce sympathetic agents: a 1% mezzotone solution, a 5% solution of efe-din hydrochloride;
- In case of cardiac arrhythmias, prescribe antiarrhythmics;
- In case of bradycardia or heart failure, enter 0.1% solution of atropine sulfate, apply indirect cardiac massage [6].

If prolonged fainting is accompanied by significant violations of cardiac activity and respiration, in addition to carrying out the entire complex of intensive care, it is necessary to ensure urgent hospitalization of the patient.

TASKS FOR FINAL CONTROL

1. During cardiopulmonary resuscitationthe following rules should be observed:

A. Head should be dropped

B. Head should be elevated

C. Compressed abdominal aorta
D. Whatever surface on which the patient lies
E. The patient should be ventilate by pure oxygen

2. Which of the following is the indication for closed-chest massage?
A. The absence of peripheral arteries pulsation
B.Midriatic pupils
C. The absence of carotid pulsation
D.Miotic pupils
E. Cyanotic skin

3. The cause of circulatory arrest in diastole is the following:
A. Acidosis
B. Hypokalemia
C. Hypercalcemia
D. Respiratory alkalosis
E. Hypoglycemia

4. After a primary circulatory arrest spontaneous breathing stops after:
A. 30 sec
B. 20 sec
C. 5 min.
D. 60 sec
E. 2 min.

5. In patients with absence of pulse the asystole was diagnosedby ECG. First step measure should be:
A. Electric defibrillation
B. Adrenalin injection
C. Atropine injection
D. Calcium chloride injection
E. Lidocaine injection

6. Which of the following medicines cannot be injected endotracheal during cardiopulmonary resuscitation?

A.Lidocaine
B. Adrenalin
C. Noradrenaline
D. Atropine sulfate
E. Calcium chloride

7. Define the correct ratio between the number of chest compression and the respiration rate during cardiopulmonary resuscitation:

A. 5:1
B. 12:2
C. 30:2
D. 24:2
E. 9:1

8. For effective closed-chest massage in adult patients, breast bone drifts toward the spine to:

A. 1 - 2 cm
B. 5 - 6 cm
C. 7 - 8 cm
D. 3 - 4 cm
E. 8 - 9 cm

9. After injection of digoxin 0,75 mg the patient of 55 years old suddenly lost consciousness. Peripheral pulsation was absent, agonal breathing, BP didn’t determined. What examination do you have to conduct during resuscitation?

A. Heart radiokimography
B. ECG
C. Vektorcardiography
D. chest X-ray
E. Heart ultrasonography

10. Adrenaline injection resumes the cardiac function in the case of:

A. Hyperglycemia
B. Alkalosis
C. Acidosis
D. Hypokalemia
E. Acid-base balance plasma does not matter

11. 20-year-old woman suddenly felt faintnessduringphysical work-out in sportive hall. She felt acute “strike” in her head which was accompanied with severe headache, sickness, multiple vomiting with further impairment of consciousness. The neurological status: somnolent, tendon reflexes S=D, double-sided pathological Babinskij reflex, Bare test was negative,occipital muscles rigidity, positive bilateralKernigandBrudzinskij sign. What is preliminary diagnosis?

A. Subarachnoid hemorrhage.
B. Parenchimatous hemorrhage.
C. Cerebellar hemorrhage.
D. Migrainous stroke.
E. Thromboembolic ischemic stroke.

12. 60-year-old patient with malignant course of arterial hypertension and with BP 210/130 mmHg felt diffuse intensive headache, sickness, vomiting, and impairment of consciousness, generalized tonic-clonic seizure. Neurological status: positive meningeal symptoms, no focal neurological symptoms. The eye grounds: bilateral edema of optic nerve disks. After BP and brain edemacorrection, these symptoms had been regressed after 72 hours. What is preliminary diagnosis?

A. Acute hypertensive encephalopathy.
B. Subarachnoid hemorrhage.
C. Intraventricular hemorrhage.
D. Epilepsy.
E. Cardioembolic ischemic stroke.

13. Sudden 55-year-old patient felt headache. He also had vomiting, hyperemia of face and psychomotor agitation. These symptoms arouse on the basis of arterial hypertension and after emotional stress. After 10 minutes there was impairment of

consciousness and central superior paraplegia. In 3 hours meningeal symptom arose. What is preliminarydiagnosis?

A. Intracerebral bleeding
B. Subarachnoid hemorrhage.
C. Cerebellar hemorrhage.
D. Cardioembolic ischemic stroke.
E. Acute hypertensive encephalopathy.

14. After emotional stress the patient with previous myocardial infarction has coma. There was impairment of vital functions, hemodynamics reduction and respiratory impairment. Clinical exam: miotic pupils, flabby photoreaction, absence of tendon and pathological reflexes. What is preliminarydiagnosis?

A. Hemodynamic stroke.
B. Cardioembolic stroke.
C. Intracerebral bleeding.
D. Recurrent myocardial infarction.
E. Cardiogenic unconsciousness.

15. After physical exertion and alcohol intake 45-year-old patient has coma. Clinical exam: pale skin, sweating, mydriasis, BP 100/70 mmHg, body temperature 36,7^{0}C, clonicseizure, overactive tendon reflexes. Define the type of coma.

A. Postictal coma.
B. Diabetic coma.
C. Hypoglycemic coma.
D. Coma as a result of stroke.
E. Alcoholic coma.

16. Emergency team delivered unconscious patient of 18 years old to admission department. Clinical exam: coma, cyanosis, injection marks on extremities, miosis, Cheyne-Stokes respiration, BP 80/50 mmHg, heart rate 48 beats per min. Define the type of coma:

A. Narcoma.
B. Diabetic coma.

C. Hypoglycemic coma.
D. Alcoholic coma.
E. Traumatic coma.

17. The 50-year old woman was unconscious. Clinical exam: pale face, swelling, dries skin and mucous membranes, urine odor, BP 190/120 mmHg, epileptiform activity, meningeal syndrome. Define the type of coma:

A. Hepatic coma.
B. Diabetic coma.
C. Hypoglycemic coma.
D. Uremic coma.
E. Alcoholic coma.

18. The 59-year old patient was in coma. Clinical exam: icteric skin and mucous membranes, nosebleed, mydriasis, absence of photoreaction, raw-meat odor, periodic clonic convulsions, Cheyne-Stokes respiration, body temperature 38,2^{0}C, BP 80/60 mmHg, heart rate 120 beats per min, muffled heart sounds, anuria. Define the type of coma:

A. Hepatic coma.
B. Diabetic coma.
C. Hypoglycemic coma.
D. Uremic coma.
E. Alcoholic coma.

19. 60-year-old woman was unconscious. Clinical exam: dry skin and mucous membranes, cold loose skin, soft eye-bulbs by touch, nosebleed, mydriasis,Kussmaul's respiration, acetone odor, body temperature 36,2^{0}C, BP 70/40 mmHg, hart rate 120 beats per min, irregular heart rhythm, muffled heart sounds, thready pulse, abdominal distension, oliguria. Define the type of coma.

A. Hepatic coma.
B. Diabetic coma.
C. Hypoglycemic coma.
D. Uremic coma.
E. Alcoholic coma

20. 40-year old patient suddenly fainted. Clinical exam: unconsciousness, pale skin, generalized tonic-clonic convulsion with incontinency, cyanosis, BP isn't defined, heart rate 36 beats per min; ECG: atrioventricular heart block with rare ventricular complexes. What is preliminary diagnosis?

A. Epileptic seizure.

B. Morganiy-Adam's and Stock's attack.

C. left bundle block.

D. Orthostatic syncope.

E. Neurogenic unconsciousness.

Answers:

1	2	3	4	5	6	7	8	9	10
E	**C**	**A**	**D**	**B**	**E**	**C**	**D**	**B**	**C**
11	12	13	14	15	16	17	18	19	20
A	**A**	**A**	**B**	**E**	**A**	**D**	**A**	**B**	**B**

RECOMMENDED LITERATURE

I. Main

1. Mykhailovska N.S., Gritsay G.V. The basis of prevention in the practice of general practitioners. The textbook for the practical classes and individual work for 6th-years students of international faculty (speciality «General medicine») discipline «Generalpractice – family medicine, approved by the Scientific Council of Zaporozhye State Medical University (prot.№ 12 dated 30.05 2017). - Zaporozhye.- 2017.-224p.

2. Mykhailovska N.S., Gritsay G.V. E-teaching complex «The basis of family medicine» for 6th-years students of international faculty(speciality 222 «Medicine») Discipline: «General practice – family medicine», approved by the Scientific Council of Zaporozhye State Medical University (prot.№ 3 dated 02.02. 2017). - Zaporozhye.- 2017

3. Mykhailovska N.S., Gritsay G.V.The practical workbook. Discipline «General practice – family medicine» for 6-th year students of international faculty. Content module 1,2, approved by the Scientific Council of Zaporozhye State Medical University (prot.№ 4 dated 23.02. 2017). - Zaporozhye.- 2017.- 69p.

4. Mykhailovska N.S., Gritsay G.V. The practical workbook. Discipline «General practice – family medicine»for 6-th year students of international faculty. Content module 3, approved by the Scientific Council of Zaporozhye State Medical University (prot.№ 4 dated 23.02. 2017). - Zaporozhye.- 2017.- 75p.

5. Mykhailovska N.S., Gritsay G.V. Principles of family medicine. Content module 1, 2. The textbook for the practical classes and individual work for 6th-years students of international faculty (speciality «General medicine»), approved by the Scientific Council of Zaporozhye State Medical University (prot. № 4 dated February 26th, 2015). - Zaporozhye.- 2015.-138p.

6. Mykhailovska N.S., Gritsay G.V. Emergency in the practice of family doctor. Content module 3.The textbook for the practical classes and individual work for 6th-years students of international faculty (speciality «General medicine»), approved by the Scientific Council of Zaporozhye State Medical University (prot. № 4 dated February 26th, 2015). - Zaporozhye.- 2015.-164p.

7. Mykhailovska N.S., Gritsay G.V., Kulinich T.O. The basis of family medicine 3. Compilation of tests for final knowledge control for VI year students of medical faculty on the program of discipline: “General practice – family medicine” topical module 1, 2, 3 (approved by the Central Methodical Council of

Zaporozhye State Medical University (prot. № 3 dated February 13th, 2014). – Zaporozhye.- 2014.-72p.

8. Mykhailovska N.S., Gritsay G.V. Medical care in the case of chronic pain in the practice of family doctor / general practitioner. The textbook for the practical classes and individual work for 6th-years students of international faculty (speciality «General medicine»), approved by the Scientific Council of Zaporozhye State Medical University (prot. № 3 dated October 21st, 2014). - Zaporozhye.- 2014.-146p.

9. Mykhailovska N.S., Gritsay G.V. Syncope. Cardiovascular collapse, cardiac arrest, and sudden cardiac death. Seizure in practice of family doctor. The teaching textbook for the practical classes and individual work for 6th-years students of international faculty (speciality «General medicine»), approved by MoH of Ukraine (prot. № 4 protocol № 4, the 16th of December 2015). - Zaporozhye.- 2015.-175p.

10. Mykhailovska N.S., Gritsay G.V. The basis of prophylaxis of widespread diseases in the practice of family doctor. The teaching textbook for the practical classes and individual work for 6th-years students of international faculty (speciality «General medicine»), approved by Central Methodical Council of Zaporozhye State Medical University (prot. № 4 protocol № 4, dated 02.06.2016). - Zaporozhye.- 2016.-187 p.

11. Family medicine / Ian R. McWhinney, Thomas Freeman. Oxford, third edition, 2009. – 460 p.

12. Practical General Practice: guidelines for effective clinical management / Alex Khot, Andrew Polmear. Fourth edition, 2003. – 507 p.

13. Family medicine: ambulatory care and prevention / Mark B. Mengel, L. Peter Schwiebert. Fifth edition, 2009. – 879 p.

14. Current diagnosis and treatment in family medicine / Jeanette E. South-Paul, Samuel C. Matheny, Evelyn L. Lewis. 2007. – 1107 p.

15. General Practice / John Muntagn. Oxford, fifth edition, 2011. – 1535p.

16. Davidson's Principles and Practice of Medicine / Nikki R. Colledge, Brian R. Walker, Stuart H. Ralston. 21st edition, 2010. – 1376 p.

17. Harrison's Principles of Internal Medicine / Dennis Kasper, Anthony Fauci, Stephen Hauser, Dan Longo, Joseph Loscalzo, J. Jameson. 18th edition, 2011. – 4012 p.

II. Additional

1. First Exposure to Internal Medicine: Hospital Medicine / Charles H. Griffith, Andrew R. Hoellein. Lange, 2007. – 384 p.

2. Differential Diagnosis in Internal Medicine: From Symptom to Diagnosis / Walter Siegenthaler. Thieme Medical Publishers; 1 edition, 2007. – 1140 p.

3. Textbook of Gastroenterology, 2 Vol. / Tadataka Yamada), David H. Alpers, Loren Laine, Neil Kaplowitz, Chung Owyang, Don W. Powell. Lippincott Williams & Wilkins; Fourth edition, 2003. – 3478 p.

4. Murray and Nadel's Textbook of Respiratory Medicine: 2-Volume / Robert J. Mason, V. Courtney Broaddus, Thomas Martin, Talmadge King Jr., Dean Schraufnagel, John F. Murray, Jay A. Nadel. Saunders, 5thedition, 2010. – 2400 p.

5. Williams Textbook of Endocrinology / ShlomoMelmed, Kenneth S. Polonsky, P. Reed, Henry M. Kronenberg. Saunders, 12th edition, 2011. – 1920 p.

6. Williams Hematology / Kenneth Kaushansky, Marshall Lichtman, E. Beutler, Thomas Kipps, Josef Prchal, Uri Seligsohn. 8th edition, 2010. – 2460 p.