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

PRINCIPLES OF FAMILY MEDICINE

THE TEXTBOOK FOR THE PRACTICAL CLASSES AND INDIVIDUAL WORK FOR 6TH-YEARS STUDENTS OF INTERNATIONAL FACULTY (SPECIALITY «GENERAL MEDICINE»)
DISCIPLINE: «GENERAL PRACTICE – FAMILY MEDICINE»

Content module 1,2

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Approved by:
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Methodical recommendations 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".

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CONTENT

PREFACE

The primary medical care develops according international standard of Public health. The purpose of primary medical care is to decrease the morbidity, disability and mortality by means of effective, available general practice – family medicine. The mastering of principles of family medicine is very important.

This textbook is composed according the requirements of typical working program (2009) and working program (2013) of academic discipline «General practice – family medicine», specialization 7.12010001 «General medicine», 7.12010002 «Pediatrics». The necessity of this textbook is conditioned by absence of such workbooks, which satisfy requirements of basic parts of academic discipline «General practice – family medicine».

This textbook includes the educational material for practical classesand individual work of students, Module 1 (content modules 1, 2), the tests for initiasl and final control, situational tasks for academic discipline «General practice – family medicine», updated qualification characteristics of family doctor, basic recording documentation of primary medical care, questions for final module control for academic discipline «General practice – family medicine», the protocol of patient's examinatoion (epproved by department «General practice – family medicine»), recommended literature.

The purpose of this textbook is acquiring of knowledge and practical skills of 6^{th}-years students during preparation for classes and final module control.

THE THEMATIC PLAN OF PRACTICAL CLASSES

Module 1: «The organizational aspects of the system of the primary health care in Ukraine, its role in the development and reforming of the Public health».

№	Topic	Number of hours
Content module 1. ***Modern approaches to the medico-social and organizational basis of a primary health care***		
1	The place of the family medicine in the structure of a healthcare system and the principles of the family service. The organization of the FD's work. The basis recording documentation of FD in medical institution. The role of information system in FD practice. The basis of information processing of out-patient clinic.	7
Content module 2. ***Medico-social aspects of population's health - the basis of the preventive and curing medicine***		
2	Medico-social aspects of the population's health. The medical examination of the population, and rehabilitation in the family doctor's practice. Medical insurance structure and family doctor activity. The models of medical insurance in the world.	6
3	3.1.The assessment of the risk factors of the main chronic non-epidemic diseases and the preventive measures in case of the cardiovascular, bronchopulmonary, gastrointestinal diseases and some other common syndromes. A role of family doctor in popularization of healthy life style and prophylaxis. The dietotherapy. "The health school". 3.2.The prophylaxis of AIDS.	4 2
4	4.1.The organization of out-of-hospital therapeutic help in case of the most wide-spread diseases. The principles of medico-social expertise. The organization of the day hospital and home care. 4.2.The consultation in the context of HIV-infectious, voluntary testing. 4.3.The consultation in the context of incurable disease and imminent death. The organization of medical care for non-curable patients. The principle of multidisciplinary approach to medical care of non-curable patients and their relatives. Nursing, the methods of palliative care of symptoms and syndromes.	2 2 2

№	Topic	Number of hours
Content module 3. ***The emergency in the family doctor's practice.***		
5	The emergency in the practice of family doctor. The emergency in the pre-hospital stage in the case of cardiac arrest, acute coronary syndrome, respiratory standstill, arrhythmias, hypertensic crisis, bronchoobstructive syndrome.	6
6	6.1.The emergency in the practice of family doctor in the case of pain syndrome. 6.2.The clinical classification of pain. The mechanism of pain in incurable patient. The principles of treatment of chronic pain syndrome. The emergency in context of incurable diseases and imminent death.	4 2
7	The emergency in the practice of family doctor in the case of seizure, syncope, coma in case of diabetes, acute hepatic failure, alcohol intoxication, renal insufficiency, narcotic abuse.	6
8	The emergency in the practice of family doctor in the case of bite, sting, electrical injury, drowning, frostbite and thermal injury. Final module control.	5 2
	TOTAL	50

THE THEMATIC PLAN OF INDEPENDENT WORK OF STUDENT

№	Topic	Number of hours	Control type
1	Preparation to the practical classes, the academic level and training of practical skills	20	Current control during practical classes
2	The implementation and defense of the practical tasks	4	
3	Filling of the family doctor's documentation	3	
4	The preparation and writing of the program of treatment in out-patient in the case of most widespread diseases	4	
5	Drew up the algorithms of the pre-admission emergency in the family doctor's practice	4	
6	The report at a clinical conference of hospitals.	1	
7	Preparation for the final module control	4	Final module control
	Total	40	

TOPIC 1

The place of the family medicine in the structure of a healthcare system and the principles of the family service. The organization of the FD's work. The basis recording documentation of FD in medical institution. The role of information system in FD practice. The basis of information processing of out-patient clinic.

I. Theme actuality. According WHO, the family medicine is the system of Public health which has to provide personal, comprehensive and continuing care for the individual in the context of 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 development of primary medical care is decreasing of morbidity, disability and mortality by effective work of family doctors.

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 including (if appropriate) components of further testing, specialist referral, medication, therapy, diet or life-style changes, patient education, and follow up results of treatment, also counsel and educate patients on safe health behaviors, self-care skills and treatment options, provide screening tests and immunizations. So, the family medicine is a medical specialty and the principles of primary medical care.

The family doctor is specialized in family medicine after the medical degree. He provides continuing and comprehensive health care for the individual and family across all ages, genders, diseases, and parts of the body, delivers a range of acute, chronic and preventive medical care services, on the basis on knowledge of the patient in the context of the family and the community, emphasizing disease prevention and health promotion, manage chronic illness, often coordinating care provided by other subspecialists.

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:

- to find out the place of family medicine in the general structure of Public health;
- to explain the basic models of primary medical help;
- to ground principles of family maintenance of population - continuity of medical care;
- to characterize the basic functions of family doctor: abilities to socialize with a

patient and his family and decision of them social-and-medical problems;

• to analyze the indexes of necessary registration medical documentation of establishments of family medicine.

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. The Health protection is:

A. A system of measures, sent to provision, maintenance and development of physiology and psychological functions, social activity and optimal capacity 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. A medical help is a complex of measures which directed on:

A. help to the persons with acute diseases, opening of new establishments of Public health, rehabilitation of patients and invalids.

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

C. provision of sanatorium-and-spa treatment, increase of sanitary culture

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

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

3. Establishments of Public health are:

A. establishments which provide the management of health a guard

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

C. establishments of medical care for population

D. social establishments for be single and elderly people.

4. The body of Public health is:

A. establishments which provide the management of health a guard

B. enterprise, establishments and organizations which provide the various requirements of population in industry of Public health and medical provision.
C. establishments of medical care for population
D. social establishments for be single and elderly people.

5. What normative document in Ukraine is predefining the professional duties of medical and pharmaceutical workers?
A. the law of Ukraine "About provision of sanitary and epidemic prosperity of population"
B. the law of Ukraine "Basis of legislation about Public health"
C. the Ukraine constitution
D. the law of Ukraine "About medications"
E. conception of reformation of system of Public health of Ukraine.

6. Which normative document in Ukraine includes these definitions of concepts "health", "Public health", "body of Public health"?
A. Law of Ukraine "About provision of sanitary and epidemic prosperity of population"
B. law of Ukraine of "Basic of legislation about Public health"
C. the Ukraine constitution
D. law of Ukraine "About medications"
E. conception of reformation of system of Public health of Ukraine.

7. Principles of Public health are 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 of prophylactic measures;
D. accessibility of medical help;
E. social security of citizens in case of loss of health.

8. How many forms of compounding function today in practical activity of family doctor:
A. 2
B. 4
C. 3
D. 1
E. the compounding forms of the ratified forms do not have.

9. Who has right to give consent to medical intervention?
A. attending doctor;
B. head doctor;
C. patient;
D. administration of enterprise, 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	B	B	E	C	C	A

VI. Basic questions after a theme

1. Principles of organization of system of primary medical help.
2. Basic principles, advantages of new model of the primary medical help.
3. Transition from the district-territorial principles of medical care to family medicine in Ukraine.
4. Principles of family maintenance of population are continuity of medical care.
5. Basic normative documentation of family doctor.
6. Basic functions and maintenance of work of family doctor.
7. Features of work of family doctor and district doctor.
8. The interrelation of family doctor with a patient and his family.
9. Psychogenic, deontology aspects of activity of family doctor.
10. Decision of medico-social problems of family.

VII. Practical skills

Practical class is conducted in out-patient's clinic; students together with family doctors conduct the reception of patients; analyze interrelation of doctor with a patient and his family, study basic functions and maintenance of work of family doctor, meet with 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 columns of document.

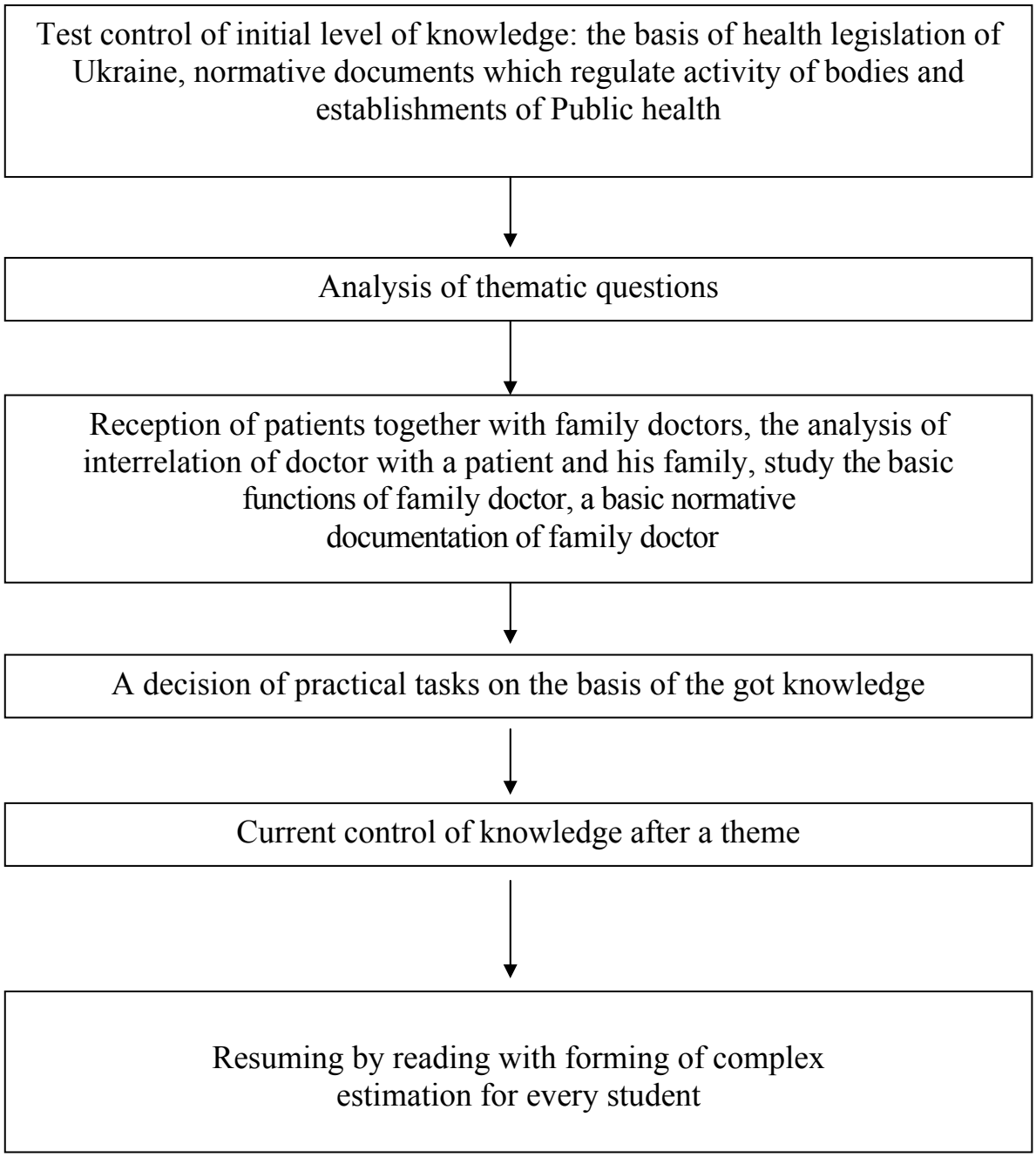
4. Offer the arguments for satisfied the family necessity of urgent operative intervention.

Independent work: preparation to practical studies - 4 hours.

VIII. The plan and organizational structure of practical training

№	Stage	Hours, min	Educational materials		Place of realization of studies
			Facilities of studies	Equipment	
1	Control of initial level	15 min	Tests		Classroom
2	Analysis of theme	90 min	Oral test		Classroom
3	Practical work	115 min	Out-patients case record		Family out-patient's clinic
4	Current control of knowledge	15 min	Situational tasks		Classroom
5	Summation of studies	5 min			Classroom
6	Independent work	4 hours	The individual preparation to practical studies		Classroom

IX. The logical structure of theme



X. 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.

Primary care is the term for the health services by providers who act as the principal point of consultation for patients within a health care system. The WHO attributes the provision of essential primary care as an integral component of an inclusive primary health care strategy.

Primary care involves the widest scope of health care, including all ages of patients, patients of all socioeconomic and geographic origins, patients seeking to maintain optimal health, and patients with all acute and chronic physical, mental and social health issues (including chronic diseases) [3].

Depending on the nature of the health condition, patients may then be referred for secondary or tertiary care.

A primary care practitioner must possess a wide breadth of knowledge in many areas.

Continuity is a key characteristic of primary care, as patients usually prefer to consult the same practitioner for routine check-ups and preventive care, health education, and every time they require an initial consultation about a new health problem.

Collaboration among providers is a desirable characteristic of primary care.

The International Classification of Primary Care is a standardized tool for understanding and analyzing information on interventions in primary care by the reason for the patient visit.

Common chronic illnesses usually treated in primary care may include, for example: hypertension, angina, diabetes, asthma, depression and anxiety, back pain, arthritis or thyroid dysfunction.

Primary care also includes many basic maternal and child health care services, such as family planning services and vaccinations [1].

In context of global population ageing, with increasing numbers of older adults at greater risk of chronic non-communicable diseases, rapidly increasing demand for

primary care services is expected around the world, in both developed and developing countries.

In accordance with the concept of reformation of the public health system in the whole world, the main part in the system of the primary health care will be assigned to the general practitioners - family doctors (GP – FD).

The primary health care (by WHO) 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 [5].

The primary medical care is the first level of contact between the single persons, families and communities and the national health care system; it approaches the medical and social care to the place of residence and place of employment as much as possible and represents the first stage in the community health protection.

"The efficiency, effectiveness and justice of the health care system depends on the discrete policy of the primary health care development which is the basis of the public health care because only within the scope of the primary health care the realization of such an important for the people principle of generally accessibility of the medical care is realized" (*WHO).*

Family medicine (**FM**) is a medical specialty devoted to comprehensive health care for people of all ages.

It is a division of primary care that provides continuing and comprehensive health care for the individual and family across all ages, sexes, diseases, and parts of the body.

It is based on knowledge of the patient in the context of the family and the community, emphasizing disease prevention and health promotion.

According to the **World Organization of Family Doctors** (Wonca), the aim of family medicine is: to provide personal, comprehensive and continuing care for the individual in the context of the family and the community [2].

The issues of values which underlying this practice are usually known as primary care ethics.

In Europe the discipline is often referred to as general practice, emphasizing its holistic nature rather as well as its roots in the family.

The term "family medicine" is used in many European and Asian countries, instead of "general medicine" or "general practice".

Family physicians deliver a range of acute, chronic and preventive medical care services.

In addition to diagnosing and treating illness, they also provide **preventive care**, including:

a. routine checkups,
b. health-risk assessments,
c. immunization and screening tests, and

d. personalized counseling on maintaining a healthy lifestyle.

Family physicians deliver a range of acute, chronic and preventive medical care services.

A set of skills and scope of practice may define a primary care physician, generally including basic diagnosis and treatment of common illnesses and medical conditions.

Diagnostic techniques include interviewing the patient to collect information on the present symptoms, prior medical history and other health details, followed by a physical examination.

Many FDs are trained in basic medical testing, such as interpreting results of blood or other patient samples, electrocardiograms, or x-rays [4].

More complex and time-intensive diagnostic procedures are usually obtained by referral to specialists, due to either special training with a technology, or increased experience and patient volume that renders a risky procedure safer for the patient.

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

- ease of communication,
- accessible location,
- familiarity,
- increasingly issues of cost and managed care requirements.

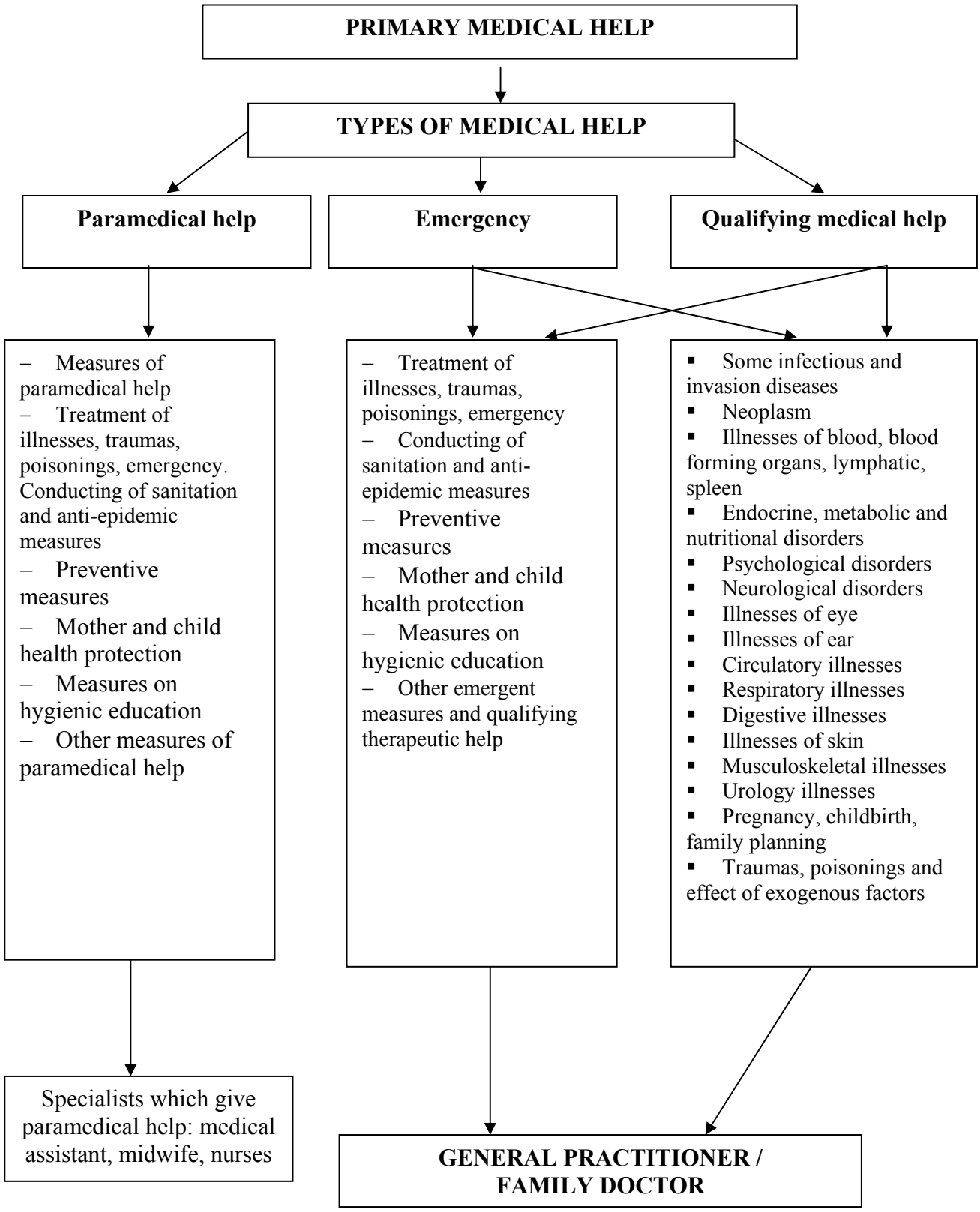
Ideally, the FD acts on behalf of the patient to collaborate with referral specialists, coordinate the care given by varied organizations such as hospitals or rehabilitation clinics, act as a comprehensive repository for the patient's records, provide long-term management of chronic conditions.

Continuous care is particularly important for patients with medical conditions that encompass multiple organ systems and require prolonged treatment and monitoring, such as diabetes and hypertension [1].

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



Typical organization of primary medial help for rural population

District center

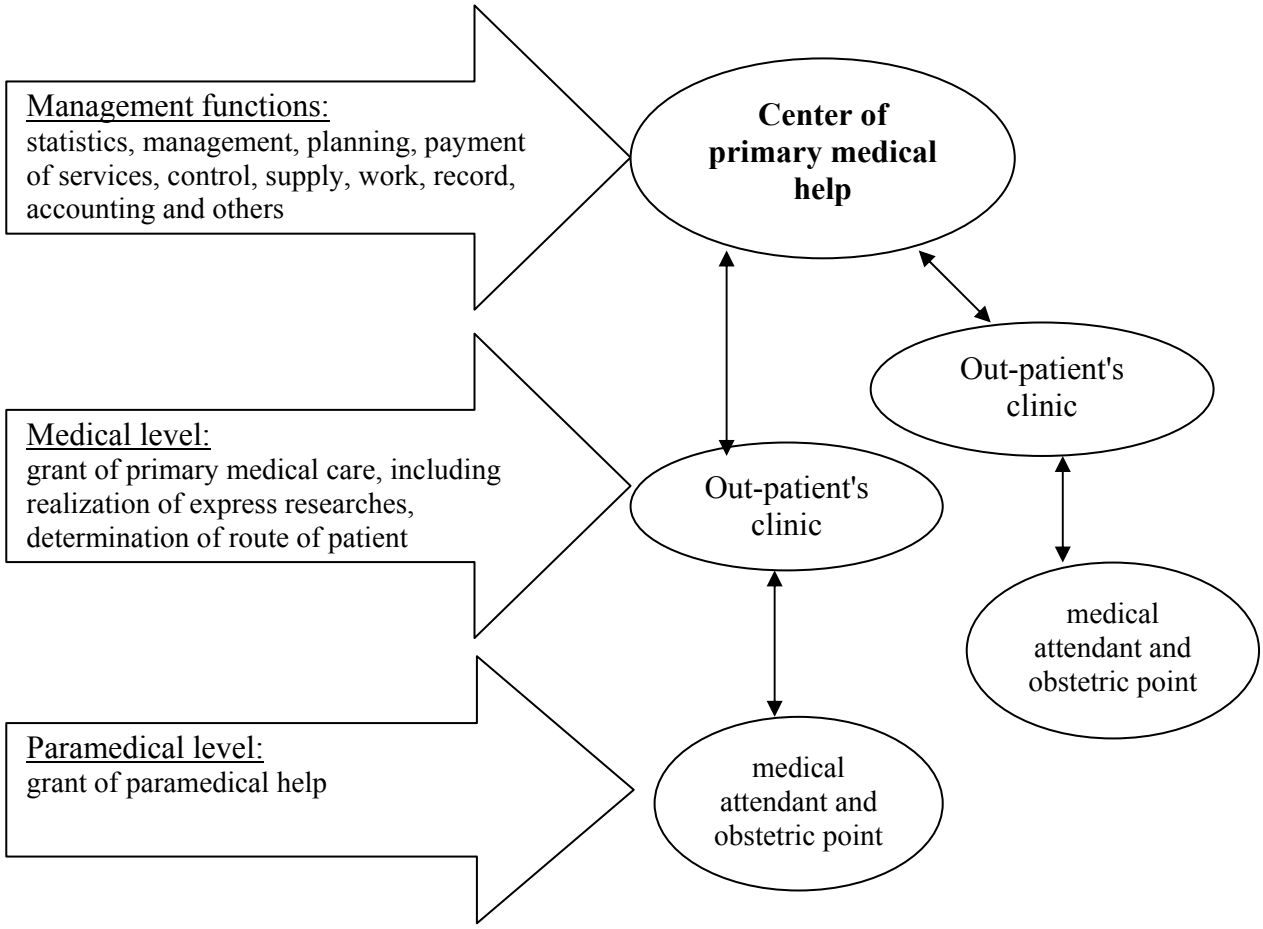
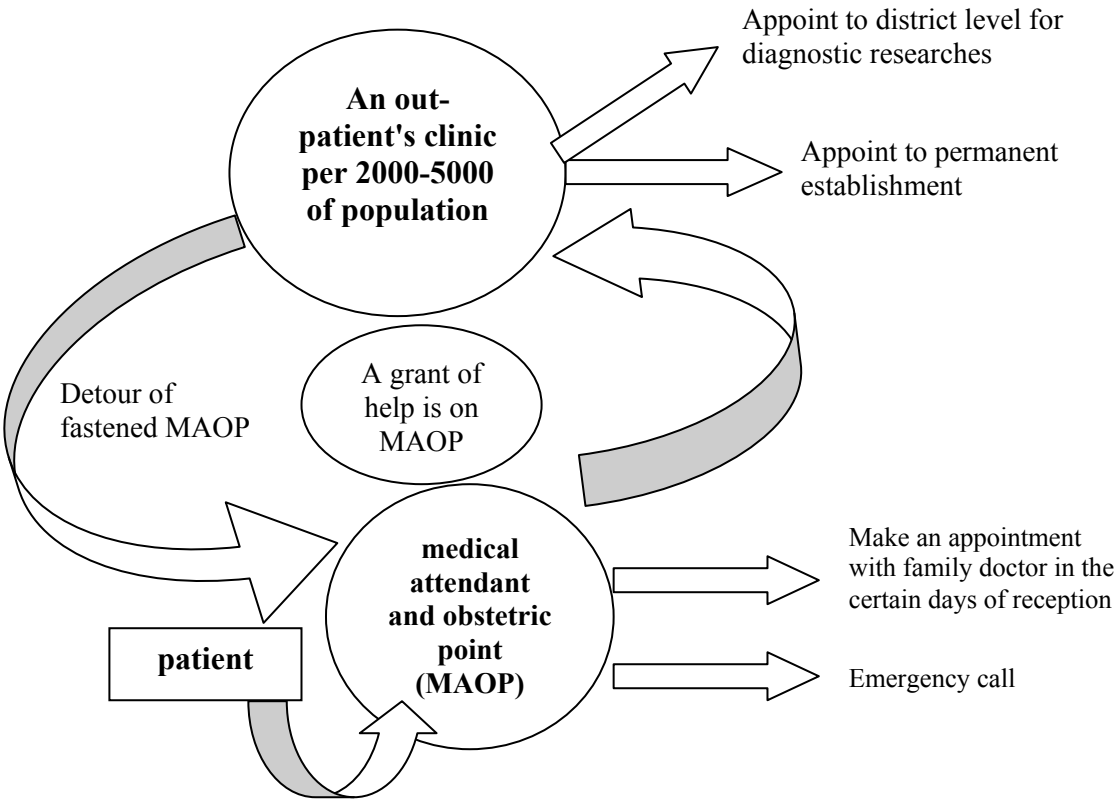
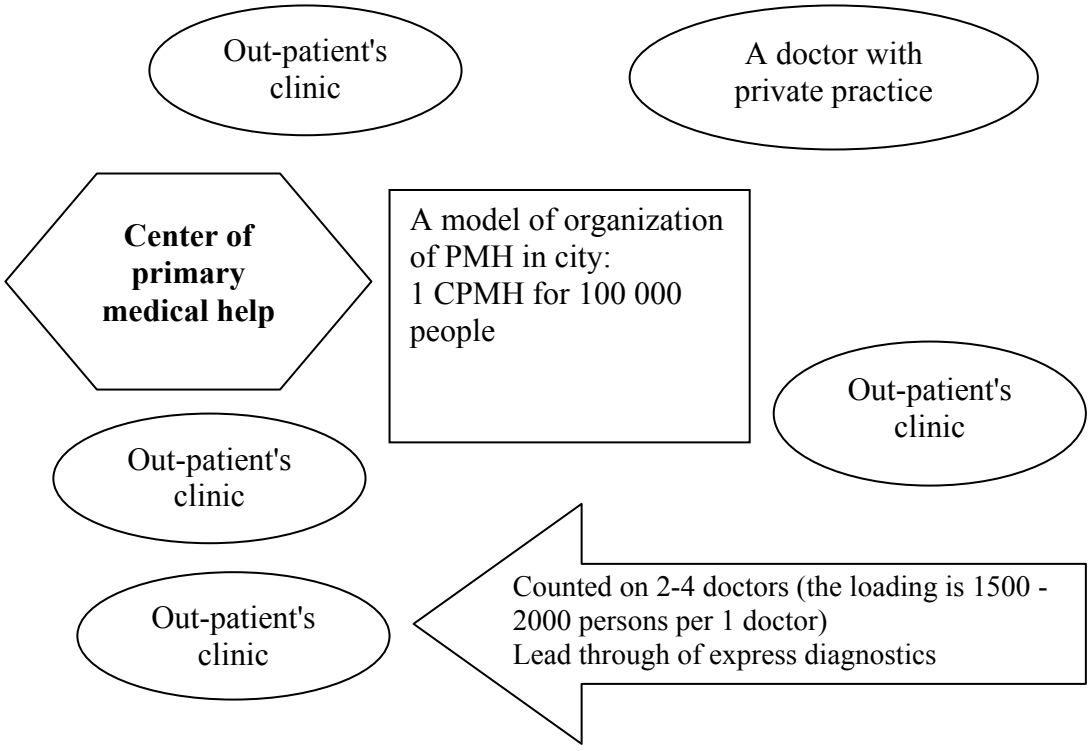


Chart of work with a patient at primary level of medical care in rural area



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

XI. Tasks for final control

1. Which normative document contains basic principles of Public health in Ukraine?

A. Law of Ukraine "About provision of sanitary and epidemic prosperity of population"

B. law of Ukraine "Basis of legislation of Ukraine about Public health"

C. The constitution of Ukraine

D. Law of Ukraine "About medications"

E. The conception of reformation of Public health in Ukraine.

2. What normative document in Ukraine determines a right of citizen for health protection, medical care and medical insurance ?

A. Law of Ukraine «About provision of sanitary and epidemic prosperity of population»
B. Law of Ukraine «Basis of legislation of Ukraine about Public health»
C. The constitution of Ukraine
D. Law of Ukraine «About medications»
E. The conception of reformation of Public health in Ukraine.

3. What normative document is marked in Ukraine as «alteration of primary medical help foresees introduction of principles of family medicine»?
A. Law of Ukraine «About provision of sanitary and epidemic prosperity of population»
B. Law of Ukraine «Basis of legislation of Ukraine about Public health»
C. The constitution of Ukraine
D. Law of Ukraine "About medications"
E. The conception of reformation of Public health in Ukraine.

4. Which drugs are prescribed by prescription form №2?
A. Prescribed to the patient by special price
B. Anabolic hormones
C. Drugs which act in the limited amount
D. Psychotropic drugs
E. Narcotic drug.

5. What drugs are prescribed by prescription form №3?
A. Drugs and wares of the medical setting in accordance with law of MPH of Ukraine № 233 (25.07.1997 y.)
B. Drugs of non-quantitative account
C. Narcotic drugs and psychoactive drug
D. Prescribed to the patient by special price
E. With alcohol

6. What index includes the ration of first registered cases of major non-epidemic diseases during year for average annual population size:
A. Index of prevalence of major non-epidemic diseases
B. Major non-epidemic morbidity;
C. Structure of major non-epidemic morbidity;
D. Pathological affected;
E. There is not a right answer.

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. What is included in section "Development of primary medical help" of national project of Public health?

A. Wage rise to family doctors, district doctors, district pediatricians, nurses;

B. Retraining of family doctors, district internists, district pediatricians;

C. Rigging the out-patient's establishments diagnostic facilities;

D. Rigging the emergency cars;

E. All of mentioned above

9. Tasks of national project in Public health are:

A. Development of primary medical help;

B. Prophylactic measures;

C. Population provision by hi-tech medical care;

D. Guard of maternity and childhood.

E. All of mentioned above

10. When have to be used the measures cases of obligatory and forced character during realization of medico-diagnostic process?

A. During treatment of child;

B. In the case of hospitalization;

C. During quarantine measures realization and diseases in the case special danger infection.

D. During laboratory examination

E. During x-ray examination

Answers:

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

XII. 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

Medico-social aspects of the population's health. The medical examination of the population, and rehabilitation in the family doctor's practice. Medical insurance structure and family doctor activity. The models of medical insurance in the world.

I. Theme actuality. Perspectives on prevention. The primary goals of prevention in medicine are to prolong life, to decrease morbidity, and to improve quality of life - all with the available resources. Working in partnership with patients, physicians play critical roles as educators, managers of access to screening and intervention services, and interpreters of divergent recommendations for promoting health. Despite evidence of the effectiveness of many preventive services in prolonging healthy life and decreasing medical costs, physicians frequently do not integrate appropriate preventive practices into their care. Obstacles to providing optimal preventive care include lack of appropriate training, doubt about the effectiveness of preventive interventions, skepticism about patients' commitment to change, limited reimbursement and time, and conflicting professional recommendations. Success achieved for populations may not be visible to individuals, and physicians may not appreciate the cumulative benefit of their efforts. Despite considerable success in some areas, such as the reduction of smoking by U.S. adults from 40 percent to 25 percent in the last 30 years, effective behavior change in other domains is often elusive, challenging and frustrating physicians and patients alike.

They distinguish *primary* and *secondary* prevention. Primary prevention, including various forms of deciding what types of primary and secondary preventive care clinicians should health promotion and vaccination, is care intended to minimize risk factors and the subsequent incidence of disease. Secondary prevention is screening for detection of early disease, for example the use of mammography to detect preclinical breast cancer. While the term *secondary prevention* is also sometimes used for the prevention of recurrent episodes of an existing illness, most would consider this activity to be *tertiary prevention* care intended to ameliorate the course of established disease. Offer to their patients is not a trivial matter. The U.S. Preventive Services Task Force (USPSTF), The Canadian Task Force on the Periodic Health Examination and the American College of Physicians, among other organizations, has critically reviewed the strength of available evidence for preventive practices and has made recommendations. Adopting an evidence-based approach to the development of preventive practices policy is an essential step to assuaging provider concerns about the validity of particular recommendations, to identifying the specific basis of controversies in prevention, and to reassuring patients that certain interventions will do more good than harm.

II. Study purposes: to outline the basic socio-medical aspects of population health and find out the role of family doctor in promotion of healthy life style, preventive work.

III. Concrete purposes of the module:

- to acquire a basic principles of medical and preventive help to the population of Ukraine;
- to be able estimate the state of health;
- to analyze meaningful risk factors, to know their classification;
- to expose the early signs of basic clinical syndromes during preventive examination and realization of the health centre system.

IV. A student must be able to collect prior medical history, examine the patient, determine risk of development of the most widespread diseases, carry out the primary prophylaxis of diseases by exposure of risk factors, to appoint and use the medicinal and non-medicinal methods of treatment for the primary prophylaxis of diseases, to estimate clinical efficiency of medicinal and non-medicinal methods of prophylaxis of diseases, carry out the clinical supervision under patients and fill medical documentation, hygienic education of population.

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 "individual 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. The state of full physical, spiritual and social well-being and not merely absence of diseases and physical defects.
D. Conditional statistical concept, which is characterized by 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. Leading groups of factors, which negatively impact on population health, are:
A. Medico-biological factors, life style and ethnic;
B. Volume and quality of medical care, education, environment and medico-biological factors;
C. Life style, medico-biological factors, environment, volume and quality of medical care;
D. Volume and quality of medical care, medico-biological factors, environment;
E. Environment, education, ethnic, life style.

4. A population health depends on the life style (in %) :
A. 49-53%
B. 18-22%
C. 17-20%
D. 8-10%
E. 55-64%

5. A volume, quality of medical care and inefficiency of prophylactic measures, negatively impact on population health (in %):
A. 49-53%
B. 18-22%
C. 17-20%
D. 8-10%
E. 55-64%

6. What is a risk factor of morbidity or death?
A. Direct reason of illness or death;
B. Endo- or exogenous additional unfavorable impact on organism, which promotes probability of disease onset or death;
C. Level of specific antibodies in the serum of blood and essential hypertension;
D. Life style, environment;
E. Environment, psycho-emotional instability.

7. 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, having a special purpose;
E. Previous, medical, quarterly.

8. According WHO classification, the individuals of 60-74 years old are:
A. Long-livers;
B. Elderly age;
C. Senile age;
D. Eenior age;
E. Middle age.

9. A healthy life style is a behavior of people with certain working conditions and mode of rest, which provides:
A. Maintenance of health;
B. The high functional capacity of organism;
C. Active longevity;
D. All of mentioned above;
E. Good nutrition.

10. The indexes for estimation of primary prophylaxis are:
A. Dynamics of primary morbidity;
B. Decline of acute diseases frequency;
C. Dynamics of primary morbidity, increase of share of healthy persons among population;
D. Decrease of mortality;
E. Decrease of chronic diseases.

Answers:

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

VI. Basic questions after a theme

A notion about a health, transient state, illness. Functional clinical syndromes in practice of family doctor. Ability to determine the state of health, fill the medical passport of health.

General principles of health promotion.

Risk of diseases onset, risk factors, elimination of risk factors, primary and secondary prophylaxis.

The principles of prophylaxis, the estimation of the health state, determination of risk factors.

Health insurance, reimbursement of hospitals and physicians.

VII. Practical skills

Practical class is conducted in out-patient's clinic; students together with family doctors conduct the primary reception of patients, estimate the state of their health, determine risk factors, and propose the plans of individual prophylaxis.

1. To fill the medical passport of family.
2. To lay down the genealogical tree of family.
3. Calculate a body mass index of woman 35 years old, which works as a doctor; her height is 165 cm, body mass 55 kg; define her day's calorie content of food, the share of albumens, fats and carbohydrates in her ration.
4. Man of 45 years old. He smokes 1 pack of cigarettes a day; his height is 175 cm, body mass is 95 kg, abdominal circumference 105 cm; during 3 years the history of arterial hypertension (BP 160/100 mm Hg), takes medicine periodically, total cholesterol level 5,8 mmole/l, a dietary intake with fat, potato, vegetables; his father had essential hypertension since young years.

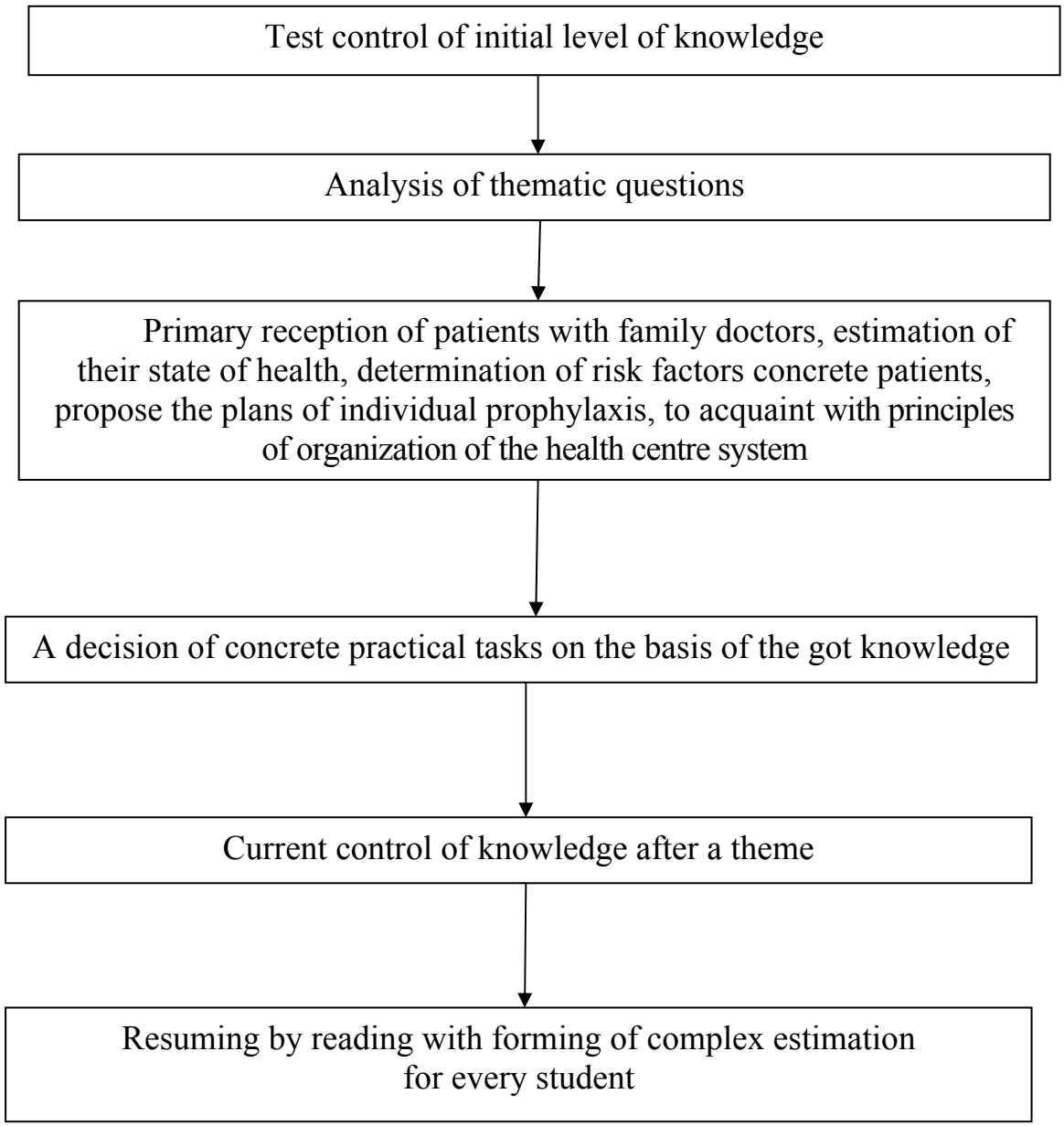
- Stratify of risk after a scale SCORE
- Stratify the additional risk for arterial hypertension
- Define a body mass index
- Appoint recommendations for life style modification.
- Medicinal treatment.
- Define purpose level of cholesterol.

5. Woman of 45 years old; smoking; BP 140/80 mm Hg; her father died because of stroke in the age of 48 years; blood glucose - 4,5 mmole/l, weight - 75 kg, total cholesterol level - 5,5 mmole/l, a height - 165 cm.

- Define a body mass index.
- Stratify risk after a scale SCORE
- Stratify the additional risk for arterial hypertension.
- Appoint recommendations for life style modification.
- Medicinal treatment.
- Define purpose level of cholesterol.
- Conduct hygienic education of patient about harmful impact of smoking.

Independent work: to fill the medical passport of health of family.

VIII. The logical structure of theme



IX. The content of theme

Primary prevention. Risk modification. Of the more than 2 million deaths that occur in the U.S. each year, as many as half may be due to preventable causes (Table 1). Life-style and behavior play a central role in the primary causes of morbidity and mortality for adults - coronary heart disease, cancer, and injuries.

Tobacco. Perhaps the largest potentially modifiable risk to health is the abuse of tobacco products. Responsible for more than 400 000 deaths each year and an estimated annual cost to society as high as $50 billion, tobacco abuse accounts for a substantial fraction of cardiovascular, cancer, and pulmonary morbidity and mortality. Recent evidence also suggests that passive exposure to tobacco smoke results in chronic pulmonary disease as well as lung cancer for some adults. Because of the addictive properties of nicotine, preventing the initiation of tobacco abuse is the tobacco control intervention of choice. Most adult smokers acquire their habit as teenagers, and primary efforts to discourage initial tobacco use must engage younger audiences [1].

Counseling regarding the health risks of tobacco and methods for quitting is advised by all prevention advisory panels. Particular attention should be paid to groups at highest risk for tobacco abuse, such as men, blacks, and those with only a high school education or less. Because 70 percent of smokers come into contact with health professionals each year, the medical encounter provides an opportunity to address the health implications of tobacco abuse. Ninety percent of successful quitters will stop smoking without the aid of programmatic interventions. A review of smoking habits, recommendation to stop, and support from a health care provider may generate the impetus for an individual to make an effort to stop smoking. Respect for patients' self-efficacy, reflected in questions such as «What do you understand about the health consequences of smoking?», «Are you ready to quit?», and «What would it take for you to stop smoking?» has been suggested as a means to engage patients in the process. Setting a date to quit, arranging follow-up visits or phone calls during the initial quitting period, providing literature, and considering the use of nicotine replacement systems for those who will completely desist from the use of other tobacco products are all interventions that may improve the quitting success rate [7].

Table 1

Actual Causes of Preventable Deaths in the United States in 1990

Cause	Deaths	
	Estimated No*	Percentage of Total Deaths
Tobacco	400 000	19
Diet/activity patterns	300 000	14
Alcohol	100 000	5
Microbial agents	90 000	4
Toxic agents	60 000	3
Firearms	35 000	2
Sexual behavior	30 000	1
Motor vehicles	25 000	1
Illicit use of drugs	20 000	<1
TOTAL	1 060 000	50

* Composite approximation drawn from studies that use different approaches to derive estimates, ranging from actual counts (e.g., firearms) to population attributable risk calculations (e.g., tobacco). Numbers over 100 000 are rounded to the nearest 100 000; those over 50 000 are rounded to the nearest 10 000; those below 50 000 are rounded to the nearest 5000.

Alcohol and Drugs. The use of alcohol and drugs accounts for more than 100 000 deaths annually. While the ability of health care providers to prevent the initiation of such behaviors has not been proven, screening for exposure and addiction could potentially direct medical effort to the prevention of alcohol and drug-associated problems such as injury, violence, and medical complications of drug abuse. Although instruments such as the CAGE questionnaire have proven to be valuable for detection of alcohol abuse, no comparable brief screening strategy is available for the routine identification of illicit drug abuse. Health care providers screen inadequately for both disorders, despite evidence for effective early treatment of addictions and their complications. Recent data suggesting that moderate alcohol intake may prevent heart disease for some individuals and the lack of a biologic "gold standard" criterion for alcoholism contribute to difficulties in diagnosing alcohol abuse. Legal implications of identifying illicit drug use may hinder detection of this problem. When screening for these disorders is feasible, interventions that have proven effective include brief counseling, referral to ambulatory and in-patient treatment programs, use of 12-step and other community organizations, and appropriate use of medications such as methadone for heroin abuse [2].

Diet. Mounting evidence suggests that modification of caloric intake, both quantity and quality, can result in decreased morbidity and mortality from cardiovascular disease, cancer, and diabetes. Excess weight is an independent risk factor for coronary disease, in addition to its contribution to the incidence of diabetes,

hyperlipidemia, and hypertension. Between 20-30% of Americans are overweight, defined as 20% above the acceptable body-mass index (kg/m^2), and more than 40% of certain subpopulations, such as black, Native American, and Mexican-American women, are overweight.

Americans derive excess calories from fats, particularly saturated fats, rather than from more beneficial sources such as complex carbohydrates and fiber. Since intake of saturated fat correlates with cholesterol level, and coronary heart disease is reduced by 2 to 3 percent for every 1 percent reduction in plasma cholesterol level, dietary modification will play a central role in decreasing the primary cause of mortality in America. Excess dietary fat intake has also been associated with breast, colon, prostate, and lung cancer in epidemiologic studies. Reducing calories from all fats to 30% and from saturated fat to 10% are widely accepted goals. Increasing the intake of dietary fiber, such as from plant, legume, and grain sources, may contribute specifically to a decrease in colon cancer incidence [3].

Dietary sodium restriction may benefit those who have salt-sensitive hypertension, although the need for such restriction in the general population is unclear. Calcium and vitamin D are protective against osteoporosis, particularly in young women prior to reaching menopause, and evidence suggests that females at all ages have an inadequate intake. Menstruating women are at risk for iron-deficiency anemia. To achieve the recommended daily intake of vitamins and minerals, a varied diet including fish, lean meats, dairy products, whole grains, and five to six servings of fruits and vegetables daily is recommended, rather than the use of vitamin supplements. While evidence supporting the use of antioxidants such as vitamins E and C is still incomplete, the recommended quantities of these micronutrients can be obtained from a balanced diet.

Physicians play a critical role in effecting dietary change in their patients. The value of providing counseling and literature, referring patients to appropriate community groups and nutrition professionals, and helping patients set goals and limits for diet modification cannot be overemphasized. Despite concern about the risk of weight cycling, the health hazards of obesity appear to outweigh the potential harm of repeated weight loss and gain [1,7].

Physical Activity. A key counterpart to decreased caloric intake is increased energy expenditure. Not only can increased physical activity decrease obesity, but avoiding a sedentary life-style can also decrease the incidence of cardiac disease, hypertension, diabetes, and osteoporosis. It is estimated that only 22% of U.S. adults engage in at least light to moderate physical activity, such as walking for 30 min three to five times per week. A full quarter of the population pursues no vigorous physical activity at all. The magnitude of benefit derived from physical activity may be as great

as a 35% reduction in coronary heart disease, and even light exercise is preferable to no exercise. While the ultimate goal for optimal cardioprotective physical activity is 20 to 30 min of vigorous activity most days of the week, patients should be encouraged to approach this level gradually. A sudden onset of vigorous activity in the unfit may increase the risk for myocardial infarction and sudden death. Patients should be informed that, despite previous physical inactivity, the incremental adoption of a regular fitness program can decrease their risk of cardiovascular and other diseases to the level of those who have remained fit throughout their lives. Successful exercise programs are integrated into daily routines, self-directed, and injury-free [6].

Sexual Behavior. Because of the substantial risks of infectious diseases and unwanted pregnancy from unprotected sexual activity, patients should be strongly advised to use barrier methods for all high-risk practices such as oral, anal, and vaginal intercourse as well as additional contraceptive methods when pregnancy would not be welcome.

Environment. Physicians should adopt a broad construction of environmental risks to health, considering the physical, social, and occupational environments of their patients. Taking a complete exposure history, focusing on home, work, neighborhood, hobbies, and dietary habits can help direct interventions and recommendations. While local circumstances will dictate specific risks to which patients should be alerted, such as regional infectious diseases or particular toxic exposures produced by local industry, certain general recommendations should be adopted universally for health promotion.

Since skin cancers, the vast majority of them secondary to sun exposure, constitute the most common form of malignancy, all patients should be counseled to avoid sun overexposure and to use sunscreens. Patients should be encouraged to consider potential toxin exposures, such as those due to air pollution, household smoking, or carbon monoxide and radon gases, and be informed of the medical symptoms and consequences of such exposures. Proper food preparation and storage decrease the incidence of food-borne infectious disease [1,2].

Unintended injury constitutes a significant preventable burden of morbidity and mortality and is the leading cause of death for the general population under 40. Automobile accidents are the leading cause of unintentional injuries. The risk of being involved in a disabling traffic accident may be as high as 30% in the course of an individual's lifetime, and 50% of deaths from automobile accidents could be prevented with regular seatbelt use. Physicians should recommend seatbelt use, as well as helmet use for motorcycle and bicycle riders, since evidence supports a higher likelihood of use among patients who receive such advice. Clinicians should also recommend against operating a motor vehicle after drinking, since alcohol (and illicit drugs) is a clear-cut risk cofactor.

Smoke detectors are underused, being found in only 80% of homes. Since most deaths due to fire occur in the residential setting, patients should be encouraged to install at least one on each floor of their home.

Attention to health hazards in the workplace can identify those at risk and prevent long-term consequences of exposure. Evaluation of the work environment should include questions about exposure to metals, dusts, fibers, chemicals, fumes, radiation, loud noises, extreme temperatures, and biologic agents [7].

Community and family violence, particularly through the misuse of firearms, is the second leading cause of death from unintentional injury. Firearms, especially handguns, are far more likely to injure a family member than an intruder and are associated with increased rates of suicide and harm to children. Patients should be encouraged to remove their weapons from the home and should be informed of the risks associated with improper security and storage of firearms. While community and family violence are epidemic in the U.S., interventions to curtail violent behavior are not well established. Screening for exposure to relationship violence, developing plans for safe havens, and referrals to appropriate community and government agencies can prevent continued abuse [1].

Immunization. As many as 70 000 deaths due to influenza, pneumococcal infections, and hepatitis B occur in the U.S. annually. Despite good availability and evidence for the cost-effectiveness of recommended vaccinations for adults, only 40% or fewer members of target populations are immunized. Factors explaining poor adherence to adult immunization guidelines include lack of confidence in vaccine efficacy among providers and patients, underestimation of the severity of the target diseases, incomplete reimbursement, lack of systems to identify and vaccinate high-risk populations, and the absence of an adult requirement for vaccination equivalent to our vaccination policies for school-age children. Table 2 lists recommended adult immunizations.

Chemoprophylaxis. There is significant supportive evidence for the use of certain medications in primary prevention. Therapy of this nature in the otherwise healthy person, however, is not risk-free. The use of aspirin for the prevention of cardiovascular disease or colorectal cancer, for example, is supported by evidence from cohort and, in the case of cardiovascular disease, randomized controlled trials. The potential for cerebral bleeds and gastrointestinal intolerance, however, must be balanced against a patient's individual risk for the target diseases. Although no randomized trials have measured the impact on mortality, postmenopausal hormone replacement therapy is another therapy given to healthy women for the prevention of future disease (coronary heart disease and osteoporosis), as well as to control menopausal symptoms. These benefits must be weighed against the risks of possible breast and endometrial carcinoma. Patient involvement in the decision-making process, perhaps even informed

consent, is recommended to ensure compliance, proper use of medication, and sustained monitoring for side effects [7].

Table 2

Recommendations for Preventive Medical Care

Screening:
Blood pressure Height and weight Pap smear
FOBT and/or sigmoidoscopy*
Mammography ± breast exam +
Assess for problem drinking
Total blood cholesterol (men aged 35 to 64, women aged 45 to 64>
Vision screening ++
Assess for hearing impairment ++
Counseling:
Tobacco cessation
Avoidance of alcohol and drugs when driving, swimming, boating
Limitation of fat, cholesterol
Maintenance of caloric balance
Emphasis on grains, fruits, vegetables in diet
Adequate calcium
Physical activity
Lap/shoulder belts
Motorcycle and bicycle helmets
Smoke detectors
Storage or removal of firearms
STD prevention
Dental visits, fluoride, flossing
Contraception Fall prevention
CPR training for household++
Hot water heater at <120° ++
Immunization:
Tetanus-diphtheria (Td)
Pneumococcal vaccine++
Influenza vaccine++
Chemoprophylaxis:
Discussion of hormone replacement therapy with perimenopausal women

* *After age of 49*

\+ *After age of 49, before age 70*

++ *Age 65 +*

Secondary prevention. Widespread screening for the presence of existing diseases should meet the following criteria:

1. The targeted disease must be sufficiently burdensome to the population that a screening program is warranted. Minor changes in relative risk should have a substantial impact on the absolute risk within the population.
2. The target disease must have a well-understood natural history with a long preclinical latent period.
3. The screening method must have acceptable technical performance parameters, detecting the disease at an earlier stage than would be possible without screening and minimizing false-positive and false-negative results.
4. Efficacious treatment for the target illness must be available.
5. Early detection must improve disease outcome.
6. Cost, feasibility, and acceptability of screening and early treatment should be established [6].

While physicians underprovided certain screening services that have met these criteria (for example, regular mammograms for women over age 50 years), it is also the case that some prevalent screening practices today are not solidly rooted in evidence. Screening tests such as measurement of prostate-specific antigen and mammography in women under 50 have been adopted for use by many clinicians despite lack of complete current evidence that these services will decrease the risk of morbidity or mortality or improve the quality of life. See Table 2 recommendations of the USPSTF for screening of adults who are at average risk for target conditions. Recommendations for special-risk and vulnerable populations are available in the USPSTF *Guide.*

Community health advocacy. In addition to the direct clinical provision of preventive and health-promoting services, physicians can bring their knowledge, expertise, clinical experience, and influence to bear at the community level to promote health. Whether arguing for the denormalization of tobacco use or providing data about the health risks of local incinerators, physicians are the important sources of information and support for improving health beyond the clinical office. Such activities are consistent with the overall objective of caring for patients and may have a substantial impact on decreasing the prevalence of the root causes of disease [1].

Cost awareness in medicine. Costs of health care in the U.S. Through the 1980s and early 1990s, health care expenditures in the U.S. rose at a rate of more than 10 percent per year, which exceeded the rates of inflation and of growth in the gross national product (GNP). As a consequence, the percentage of the GNP that is spent on health care increased from about 7 percent in 1970 to 9 percent in 1980 and to more than 12 percent by the early 1990s. This escalation exceeded the increases in other western countries, such as the U.K. and Canada. Much of the difference between the U.S. and Canada is explained by higher physician fees rather than by a higher per capita

use of services. The U.S. also spends substantially more on the administrative costs of health care than Canada or Great Britain [2].

The reasons for the increase in health care costs are multifactorial. The aging of the population and the availability of new diagnostic and therapeutic advances have increased the demand for health care. Furthermore, the supply of specialists has increased dramatically, providing Americans with easier access to advanced medical services but also suggesting than an oversupply of physicians contributed to an excessive escalation in costs. The costs of care are especially influenced 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. Attempts to reduce "fat" in the health care system may be counterbalanced, at least in part, by growth in the number and age of the population and by continued advances in technology.

Despite these rising costs an estimated 15% of the population do not have health care insurance of any kind, even though nearly half are in households in which someone is employed. This lack of insurance coverage and access to health care is often blamed for the fact that the U.S., despite its high expenditures on health care, ranks about twentieth in the world in infant mortality and is not in the top ten in life expectancy [5].

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.

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 [1].

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.

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. Medicare's relative rates are similar to preexisting fee schedules in Canada [2,7].

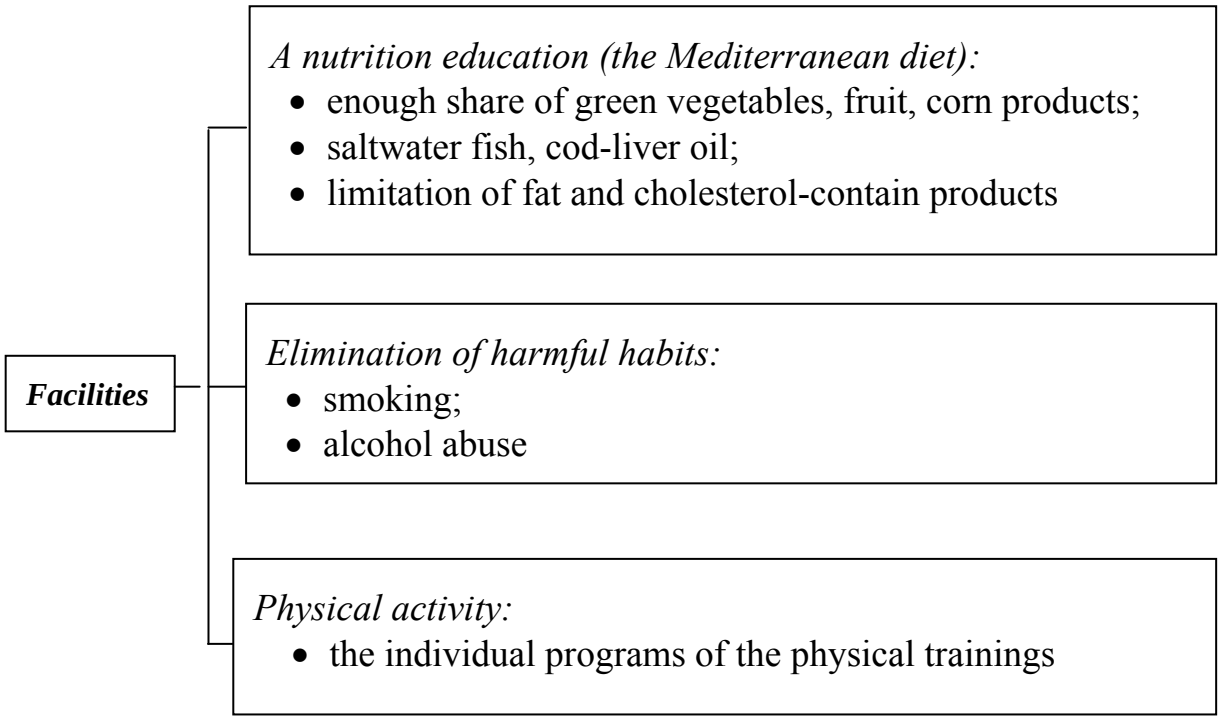
Control of health care costs. Two different approaches have been suggested to control health care costs: regulation and competition. Regulations, such as per diem rate setting, attempt to control costs by setting and enforcing practice or reimbursement standards. Other regulatory means of attempting 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.

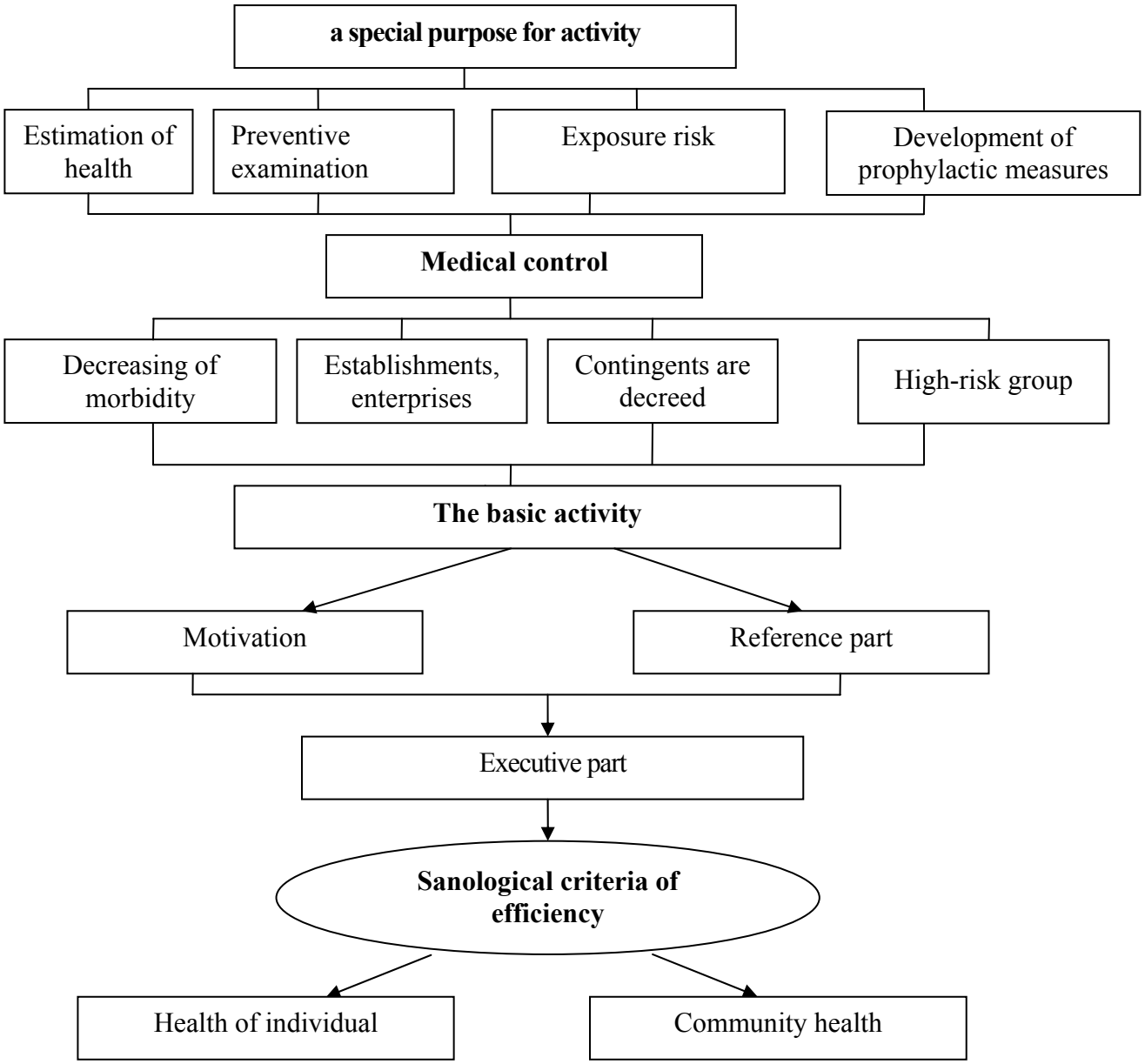
The competitive approach encourages hospitals and providers to bid in a free-market atmosphere, in which consumers will presumably make rational choices based on the perceived cost and quality of the available alternatives. Insurance plans that utilize deductibles and copayments reflect this approach. 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 [3,6].

ALGORITHMS AND TABLES ACCORDING THEME

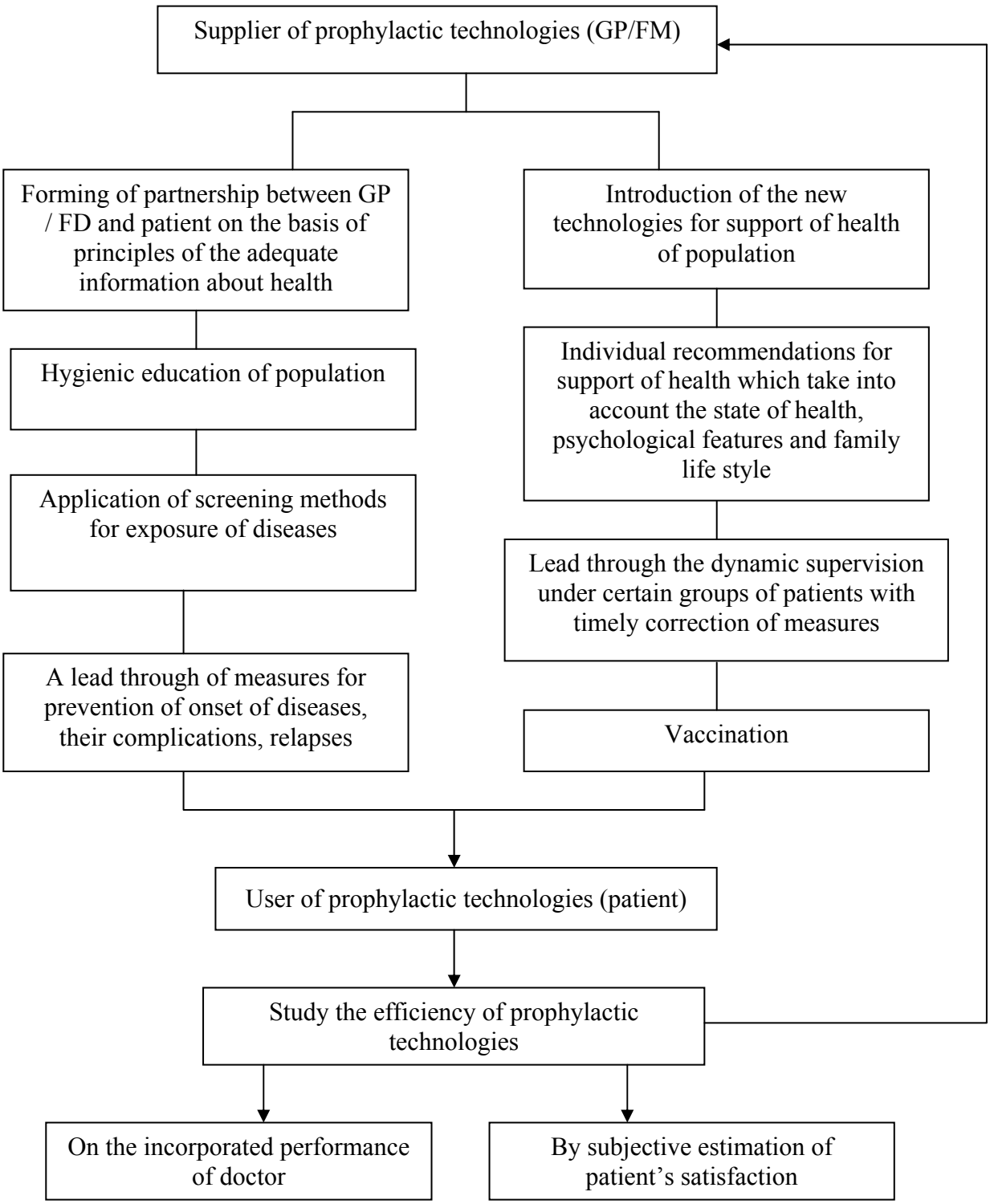
Recommendations for life style modification of patients with cardiovascular diseases



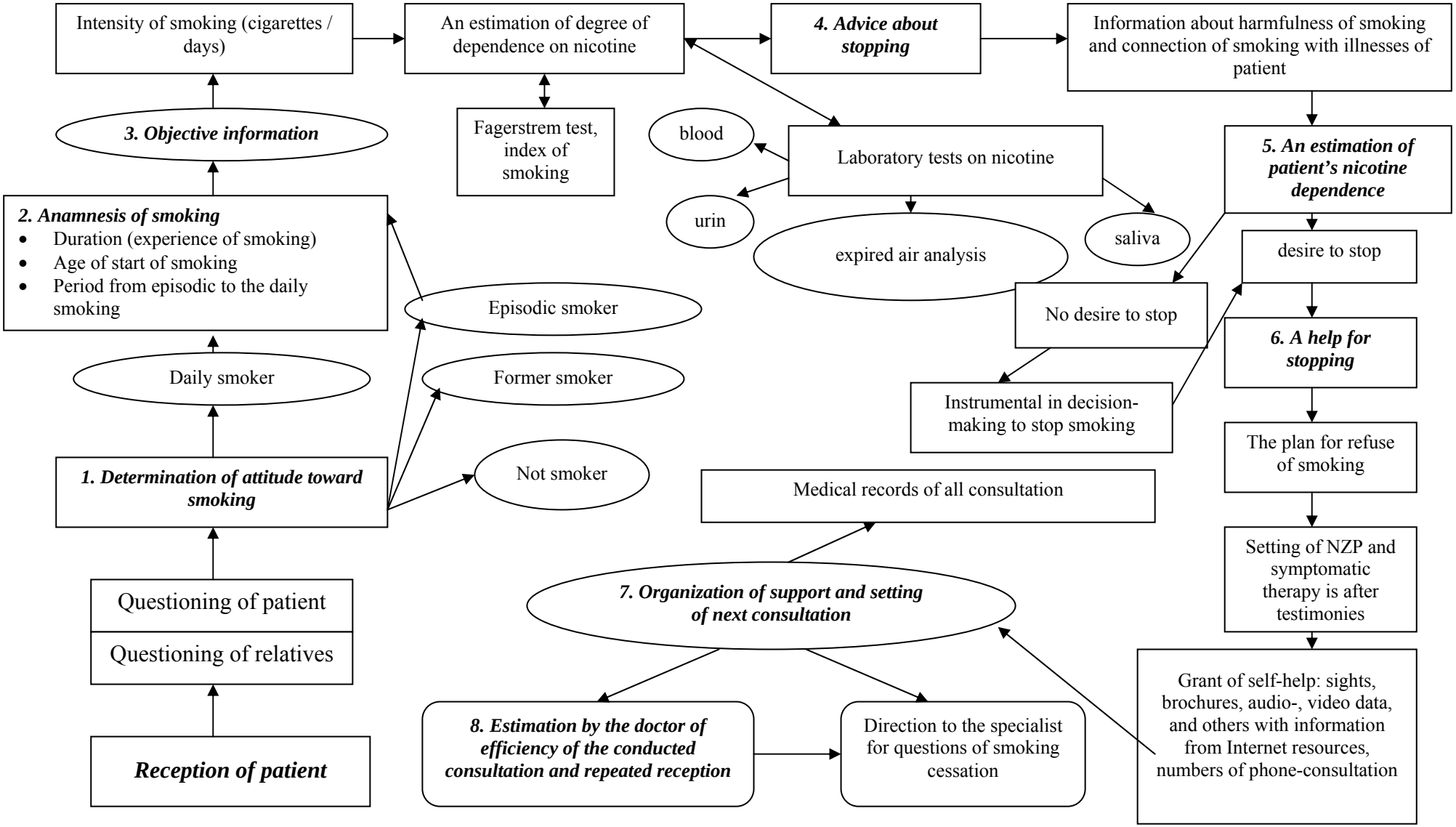
An algorithm of prophylactic medicine for family doctor



Functional model of prophylactic activity of general practitioner / family doctor (GP / FD)



An algorithm of family doctor work in out-patient clinic for relation to patient's smoking cessation



Prophylaxis of cardiovascular diseases (CVD)

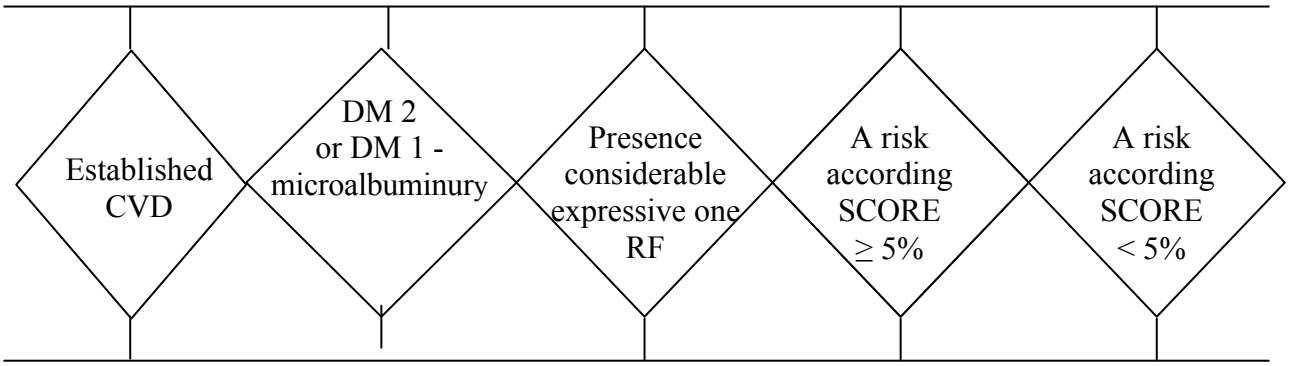
When to estimate the general risk of CVD?

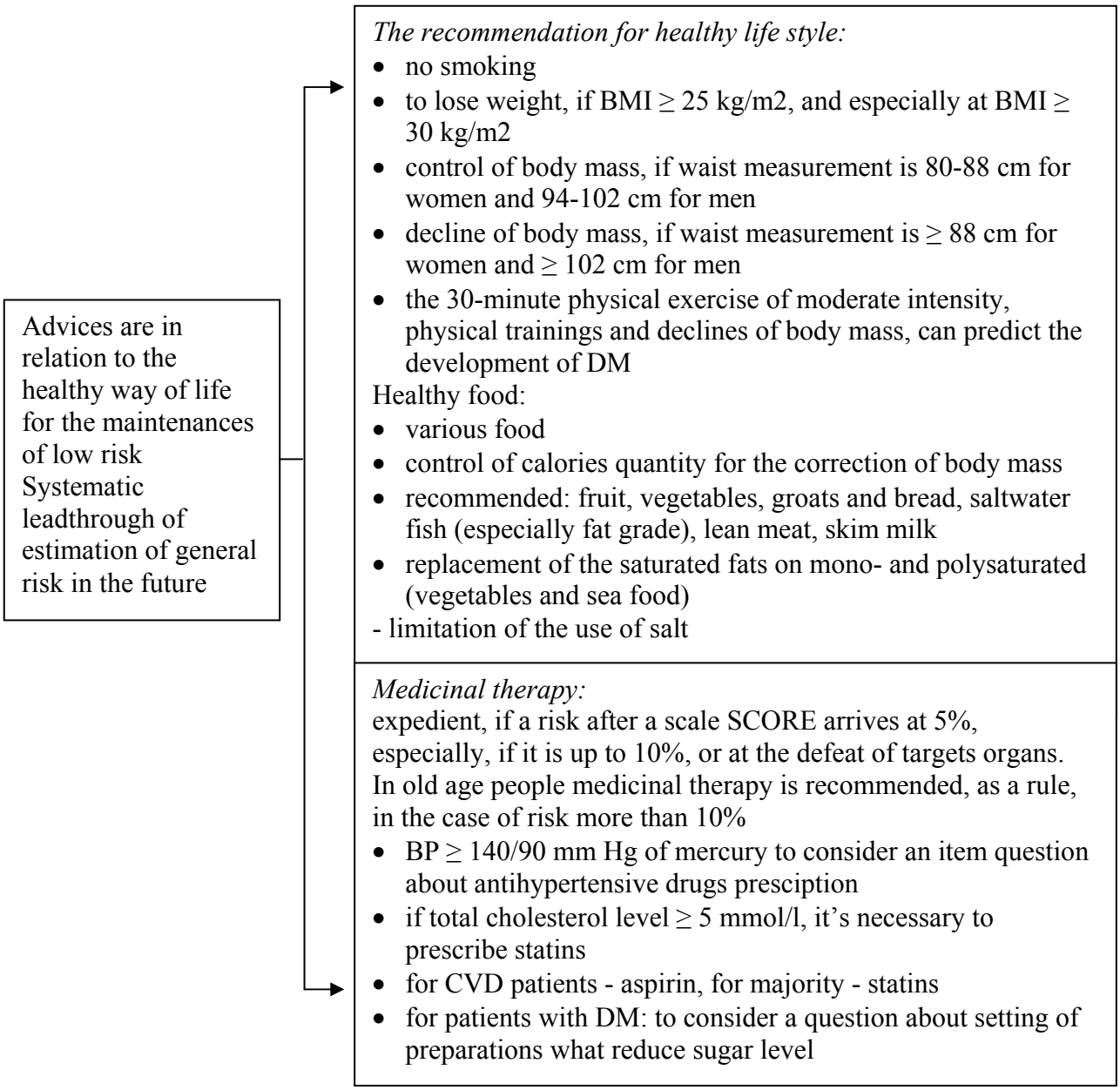
- If a patient asks about it
- If during consultation:
  - a patient of middle ages with smoke habit;
  - it's one or more risk factors, in particular, increase of cholesterol level in blood;
  - family history: early onset of CVD, presence of basic risk factors, such as a hyperlipidemia;
  - there are symptoms which specify on possibility of CVD

How to estimate a risk?*

- *Anamnesis*: prior disease; family history of early onset of CVD, smoking, physical activity, food
- *Examination*: BP, heart rate, auscultation heart and lungs, pulsation on lower extremities arteries, growth, body mass index, waistline
- *Laboratory finding*: glucose and protein level in urine, cholesterol, glucose and creatinine level in blood
- *ECG in rest and after loading:*
  In case of stenocardia suspicion - echocardiography for the persons of young age and patients with high BP;
  determination of C-reactive protein, lypoprotein (a), gomocistein, fibrinogen.
  Consultation of specialist in suspicion on CVD in young age patient

* * In default of CVD, diabetes mellitus, expressive factors of risk to use the scale of SCORE




Advices are in relation to the healthy way of life for the maintenances of low risk Systematic leadthrough of estimation of general risk in the future
The recommendation for healthy life style:
no smoking
to lose weight, if BMI ≥ 25 kg/m2, and especially at BMI ≥ 30 kg/m2
control of body mass, if waist measurement is 80-88 cm for women and 94-102 cm for men
decline of body mass, if waist measurement is ≥ 88 cm for women and ≥ 102 cm for men
the 30-minute physical exercise of moderate intensity, physical trainings and declines of body mass, can predict the development of DM
Healthy food:
various food
control of calories quantity for the correction of body mass
recommended: fruit, vegetables, groats and bread, saltwater fish (especially fat grade), lean meat, skim milk
replacement of the saturated fats on mono- and polysaturated (vegetables and sea food)
- limitation of the use of salt
Medicinal therapy:
expedient, if a risk after a scale SCORE arrives at 5%, especially, if it is up to 10%, or at the defeat of targets organs. In old age people medicinal therapy is recommended, as a rule, in the case of risk more than 10%
BP ≥ 140/90 mm Hg of mercury to consider an item question about antihypertensive drugs presciption
if total cholesterol level ≥ 5 mmol/l, it's necessary to prescribe statins
for CVD patients - aspirin, for majority - statins
for patients with DM: to consider a question about setting of preparations what reduce sugar level

X. Tasks for final control

1. Secondary prophylaxis of diseases includes:
   A. Warning to further development of illness and her complications.
   B. Prevent the onset of diseases and risk factors impact.
   C. Optimization of life style.
   D. Improvement of socio-economic condition.
   E. Medical help to the patients with the used for prevention of acute illnesses

2. The concept "individual 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. The state of full physical, spiritual and social well-being and not merely absence of diseases and physical defects.
   D. Conditional statistical concept, which is characterized by 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. The state of environment impact on population health (in %):
   A. 49-53%
   B. 18-22%
   C. 17-20%
   D. 8-10%
   E. 55-64%

4. Medicobiological factors impact on population health (in %):
   A. 49-53%
   B. 18-22%
   C. 17-20%
   D. 8-10%
   E. 55-64%

5. To the endogenous risk factors of diseases it is belonged:
   A. Level of specific antibodies in the blood serum and arterial hypertension
   B. life style, environment
   C. eyelids
   D. sex

E. heredity.

6. To the exogenous risk factors of diseases it is belonged:
   A. Psychological instability
   B. climate, life style
   C. life style, environment
   D. unspecific antibodies level
   E. environment, level of unspecific antibodies.

7. In the structure of morbidity of population in Ukraine the first place is occupied by:
   A. Illness of breathing organs
   B. neoplasm
   C. illness of the nervous system
   D. endocrine diseases
   E. illness of the system of blood circulation.

8. The basic criteria of healthy life style are:
   A. the rational food
   B. elimination of harmful habits
   C. correct sexual behavior
   D. the harmonious interrelations between people
   E. the regular physical activity

9. The risk factors of development and progress of atherosclerosis are:
   A. Passive life style
   B. smoking
   C. excessive body mass
   D. hypergomocysteinemia
   E. options A, B.

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	A	C	B	A	C	A	D	C	B

TOPIC 3

The assessment of the risk factors of the main chronic non-epidemic diseases and the preventive measures in case of the cardiovascular, bronchopulmonary, gastrointestinal diseases and some other common syndromes. A role of family doctor in popularization of healthy life style and prophylaxis. The dietotherapy. The prophylaxis of AIDS.

I. Theme actuality. Computer system of informative support of work of family doctor, out-patient's clinic of family medicine, establishments of primary medical sanitary help it is the active helper of family doctor in all directions of his medical activity, that allows more effectively to organize the work, sparing basic time to the patients, translating greater part of paper work on the helpers and computer. A computer helps in registration of medical document due to the conduct of electronic medical document of patient, that enables automatically to form a currently-registration document, and allows keeping up with both dynamics of flow of illness and «motion» of patient. The use of the newest technique provides registration of information about a patient and his family, facilitates planning of work of medical personnel with patients, provides the control of work of establishment on all spectrum of prophylactic, epidemiology, diagnostic, medical, organizational and financial functions. The personal computer provides the conduct of reception of patients, filling of registration medical document with possibility of forming of basic data for the control system by statistical information, and also conduct of the state accounting and operative analytic geometry for support of administrative account in medical establishments. Technical means give analytical possibilities after the generation of initial forms which are needed for the analysis of work by the most family doctor, and also for an administrative account by administration by estimation of quality of the done medical services, efficiency of medically-diagnostic work, and also economic analysis of activity of establishment. The controlled from distance intercourse enables to the family doctor to get information about the facts of medical service of patients of his area at other medical prophylactic establishment district, city and regional levels. The use of medical Internet-resources gives to the doctor information about medications, incorporated in Ukraine, and also about substandard and falsify series of the medications exposed on territory of Ukraine. In addition allows meeting with modern directions of development of medicine that is instrumental in the in-plant training of medical workers.

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 programmes of mandatory medical insurance. Voluntary insurance can be group and individual.

II. Study purposes: to master the methods of medical information retrieval, using basic informative sources and resources.

To extend students' knowledge in the most up-to-date approaches in organization and first aid on the ground of insurance medicine; to learn basic insurance terms and definitions, kinds of insurance.

III. Concrete purposes of the module:

- to interpret general description of directions of practical application of medical informatics;
- to analyse information of the automated centre system health;
- to analyse information of telemetric supervision on the functional indexes of patients at the cardiovascular diseases (violation of rhythm, ischemic heart trouble, arterial hypertension and others like that);
- to ground the findings are the methods of screening (measuring of AP) with the purpose of study of influencing of separate factors of risk on development and motion of arterial hypertension;
- to link findings of telemetric supervision of the state of health of population with the purpose of improvement of indexes of slings of activity of family doctor.

IV. A student must be able:

- to interpret the definition „medical insurance", „insurance medicine" – purposes and goal;
- to define constituent parts of medical insurance and to know rights and duties of insurance parties;
- to master family doctor activity in conditions of insurance medicine in Ukraine.

V. Aims of initial level

A student must be able to find necessary medical information in Internet-resources, use basic informative sources and resources.

VI. Final objectives

Students must know general definitions and terms relevant to insurance, legal base of medical insurance and know what voluntary medical insurance is provided, be able to define insurance parties, know the content of the treaty and basic requirements concerning medical aid in accordance with patient's insurance policy.

VII. Task for initial independent training

1. What states can a process during implementation be in?
   A. new, executable, ready, reading, completed;
   B. new, executable, ready, expectations, completed;
   C. new, loaded, ready, reading, completed;
   D. new, executable, ready, installation / destroying, completed.

2. External factors can influence on the change of priority:,
   A. importance of process;
   B. amount of active files;
   C. there is a necessity in allocation of memory;
   D. time of implementation;

3. What sets priority of process?
   A. by a number which marks importance of process;
   B. by a number which marks common time of implementation of process;
   C. by a number which marks the size of time slice for implementation of process;
   D. by a number which marks the amount of turns which a process can be in.

4. What operative storage fragmentation?
   A. loss of part of memory of selected to the process, but not used by him;
   B. division of address space on fragments;
   C. impossibility of the use of part of memory at the use of algorithms of division of memory with the fixed sections;
   D. impossibility of the use of part of memory at the use of algorithms of division of memory with variable sections.

5. How is the vehicle device which is imitated by programmatic facilities named?
   A. virtual;
   B. imaginary;
   C. imitated;
   D. fictitious.

6. How is intermediate data storage named in «rapid» memory for the repeated working?

A. spooling;
B. paging;
C. swapping;
D. cashing.

7. How are algorithms and data structures named for providing of saving of information in bulk storage?

A. hard disk;
B. file system;
C. virtual disk;
D. files and folders.

8. How is the logical integral data set which is kept in bulk storage named?

A. file;
B. document;
C. program;
D. cluster.

9. What does the hierarchical structure of saving of information foresee organization of saving of files in?

A. sectors;
B. clusters;
C. catalogues;
D. to the file system.

10. In medicosocial researches at estimation of health levels are selected:

A. individual health;
B. group health;
C. regional health;
D. public health;
E. all of mentioned above

Answers:

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

Insurance

1. Legal entity or individual that pays financial (insurance) subscription 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

2. Organization (legal entity) that realizes insurance, assumes a liability to indemnify and questions concearning creating and spending of insurance fund:

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

3. Individual whose life, health and efficiency is the object of insurance security:

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

4. Individual that makes an insurance treaty in the name of insurer for the commission compensation and who is a part-time servant.

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

5. Insurer's fee for the insurance contract:

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

Answers:

1	2	3	4	5
A	B	C	D	A

VIII. Basic questions after theme

Automated PMSH control systems.

Automated systems of the centre system and rehabilitation of patients health.

Automated systems of analysis of results of functional researches.

Introduction of TVmedical in practice of family doctor.

Expedience of introduction in practice of family medicine of scryning method.

Introduction of new technologies at the grant of medical services on bases of evidential medicine.

Medical insurance procedure. Insurance policy structure.

Economic essence of insurance medicine. Sources of insurance medicine financing.

Patient rights concerning chose of a doctor in conditions of medical insurance.

Organization of doctor's activity in sate and non-state health care institutions.

Problems of insurance medicine implementation in Ukraine.

Organization of quality control in different kinds of insurance.

IX. Practical skills: employment is conducted in family out-patient's clinic or policlinic, students meet with the automated informative systems, teach to use them in work of family doctor.

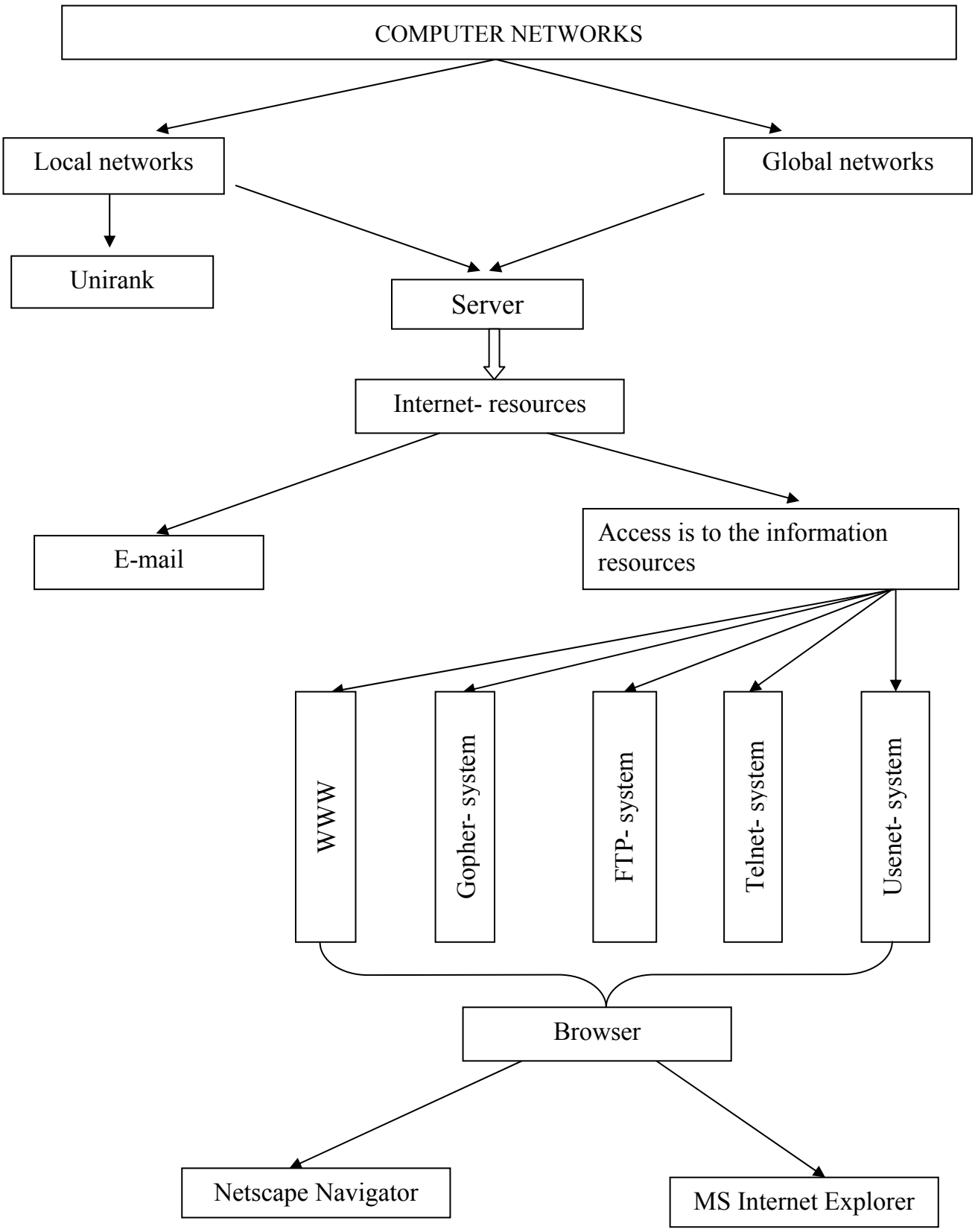
1. To put complete register of patients of the area.
2. Design a current card.
3. Find information about the methods of treatment of the set patient.
4. Make an electronic ambulatory card.
5. Design the statistical accounting in an electronic kind.

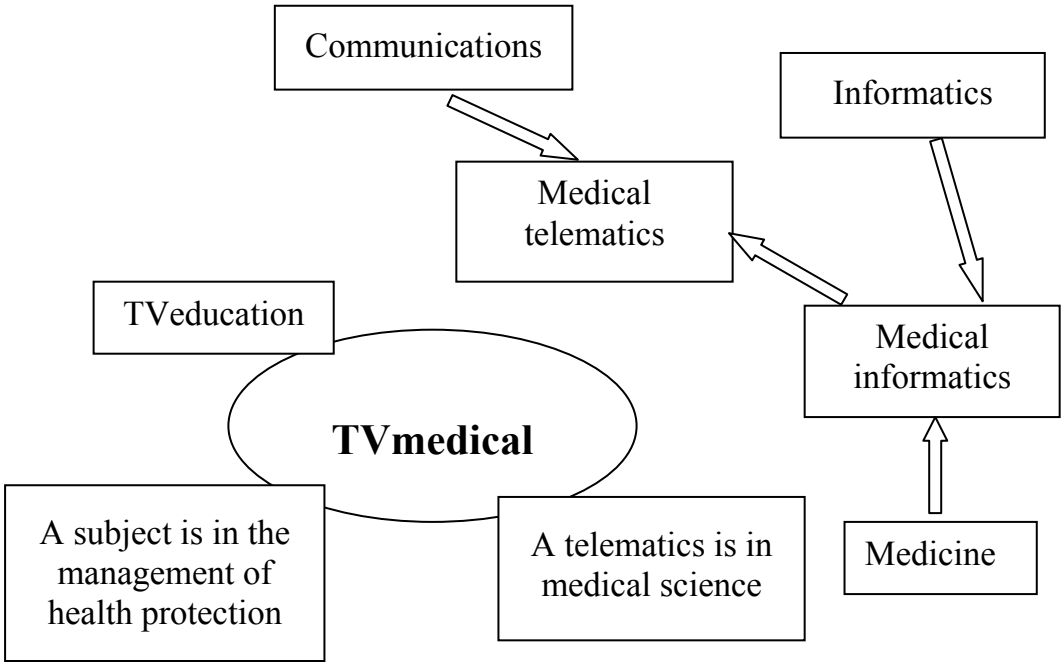
Independent work: preparation to practical studies - 4 hours.

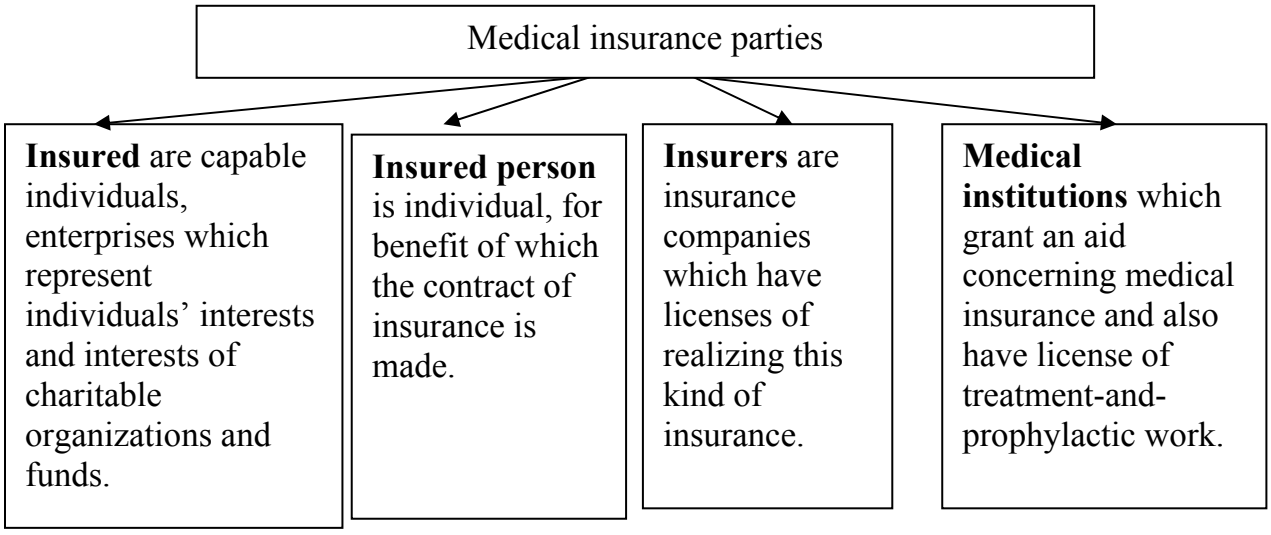
X. The plan and organizational structure of practical training

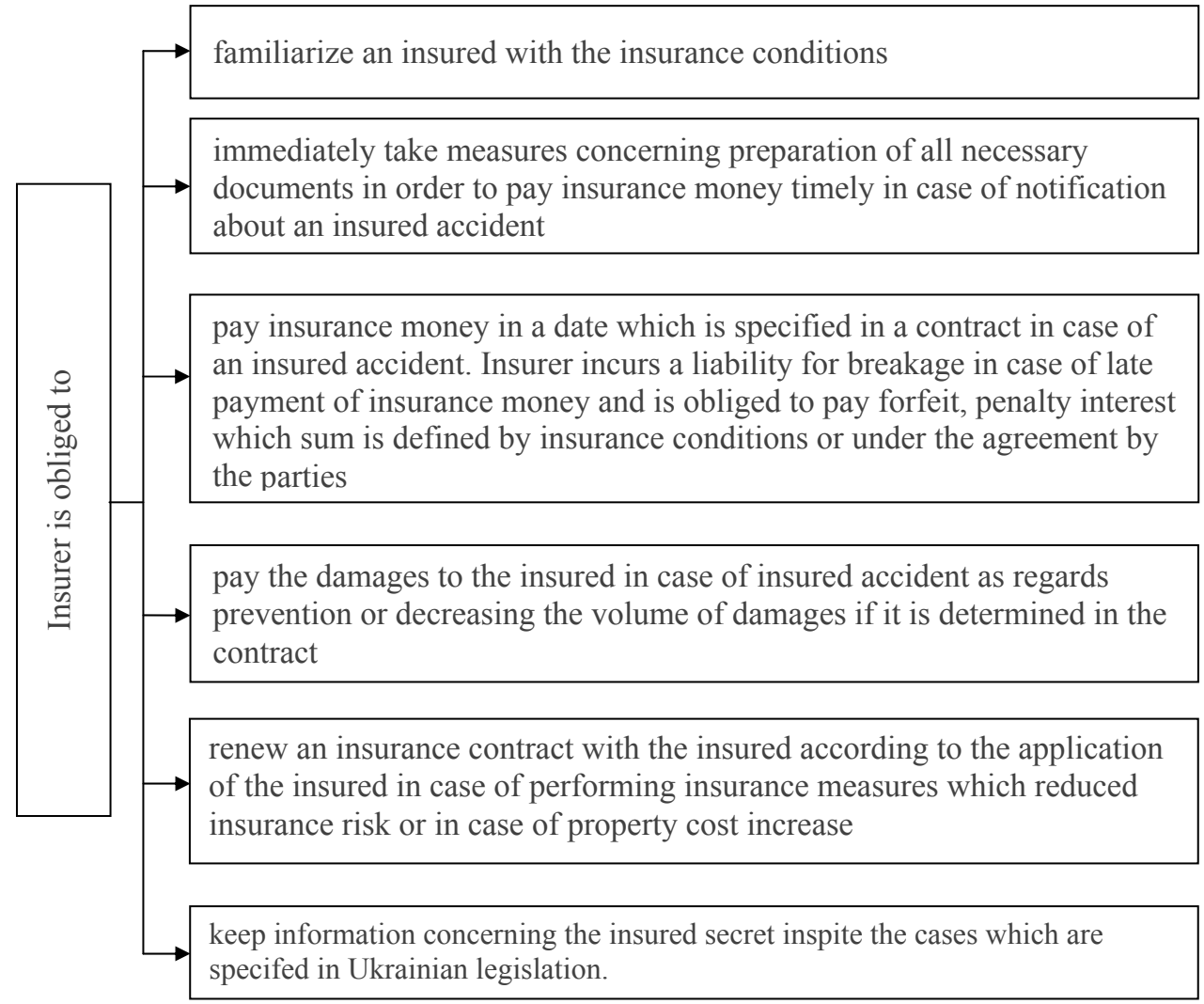
Stage	Hours, min	Educational materials		Place of realization of studies
		Facilities of studies	Equipment	
Control of initial level	15 min	Tests		Classroom
Analysis of theme	90 min	Oral test		Classroom
Practical work	115 min	Out-patients case record		Family out-patient's clinic
Current control of knowledge	15 min	Situational tasks		Classroom
Summation of studies	5 min			Classroom
Independent work	4 hours	The individual preparation to practical studies		Classroom

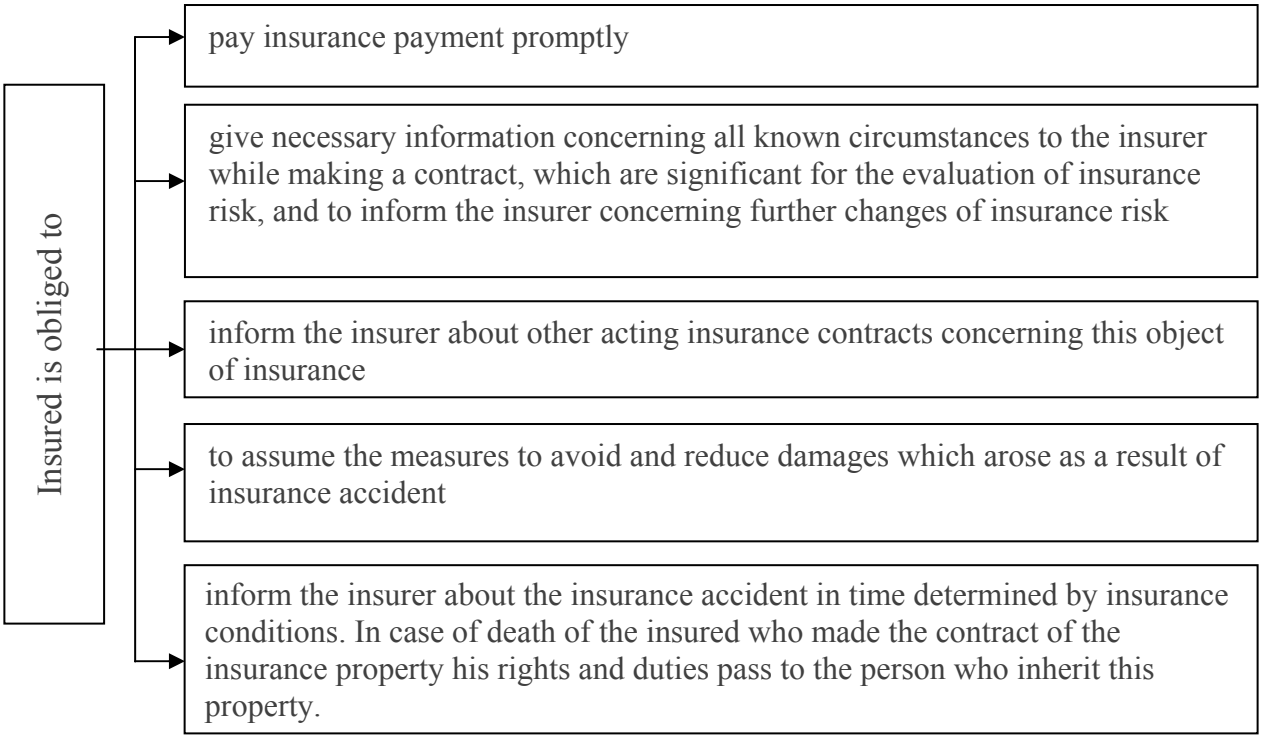
XI. The logical structure of theme




Communications
Informatics
Medical telematics
TVeducation
Medical informatics
TVmedical
A subject is in the management of health protection
A telematics is in medical science
Medicine


Medical insurance parties
Insured are capable individuals, enterprises which represent individuals' interests and interests of charitable organizations and funds.
Insured person is individual, for benefit of which the contract of insurance is made.
Insurers are insurance companies which have licenses of realizing this kind of insurance.
Medical institutions which grant an aid concerning medical insurance and also have license of treatment-and-prophylactic work.


Insurer is obliged to
familiarize an insured with the insurance conditions
immediately take measures concerning preparation of all necessary documents in order to pay insurance money timely in case of notification about an insured accident
pay insurance money in a date which is specified in a contract in case of an insured accident. Insurer incurs a liability for breakage in case of late payment of insurance money and is obliged to pay forfeit, penalty interest which sum is defined by insurance conditions or under the agreement by the parties
pay the damages to the insured in case of insured accident as regards prevention or decreasing the volume of damages if it is determined in the contract
renew an insurance contract with the insured according to the application of the insured in case of performing insurance measures which reduced insurance risk or in case of property cost increase
keep information concerning the insured secret inspite the cases which are specifed in Ukrainian legislation.


Insured is obliged to
pay insurance payment promptly
give necessary information concerning all known circumstances to the insurer while making a contract, which are significant for the evaluation of insurance risk, and to inform the insurer concerning further changes of insurance risk
inform the insurer about other acting insurance contracts concerning this object of insurance
to assume the measures to avoid and reduce damages which arose as a result of insurance accident
inform the insurer about the insurance accident in time determined by insurance conditions. In case of death of the insured who made the contract of the insurance property his rights and duties pass to the person who inherit this property.

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 finacing 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.

XII. The content of theme

Risk Factors for chronic bronchitis, emphysema, and airways obstruction

Smoking. Cigarette smoking is the most commonly identified correlate with both chronic bronchitis during life and extent of emphysema at postmortem. Experimental studies have shown that prolonged cigarette smoking impairs ciliary movement, inhibits function of alveolar macrophages, and leads to hypertrophy and hyperplasia of mucus-secreting glands; massive exposure in dogs can produce emphysematous changes. It is probable that smoke also inhibits antiproteases and causes polymorphonuclear leukocytes to release proteolytic enzymes acutely. Inhaled cigarette smoke can produce an acute increase in airways resistance due to vagally mediated smooth-muscle constriction, presumably by way of stimulating submucosal irritant receptors. Increased airways responsiveness is associated with more rapid progression in patients with chronic airways obstruction. Obstruction of small airways is the earliest demonstrable mechanical defect in young cigarette smokers, and the obstruction may disappear completely after cessation of smoking. Although smoking cessation does not result in complete reversal of more pronounced obstruction, there is a significant slowing of the decline in lung function in all smokers who give up cigarettes [8].

Passive exposure to tobacco smoke correlates with respiratory symptoms such as cough, wheeze, and sputum production. Not only is cigarette smoking the most common single factor leading to chronic airways obstruction, it also adds to the effects of every other contributory factor to be discussed below.

Air pollution. The incidence and mortality rates of both chronic bronchitis and emphysema may be higher in heavily industrialized urban areas. Exacerbations of bronchitis are clearly related to periods of heavy pollution with sulfur dioxide (SO_2) and particulate matter. While nitrogen dioxide (NO_2) can produce small-airways obstruction (bronchiolitis) in experimental animals exposed to high concentrations, there are no data convincingly implicating NO_2, at even the highest pollutant levels, in the pathogenesis or worsening of airways obstruction in humans [8].

Occupation. Chronic bronchitis is more prevalent in workers who engage in occupations exposing them to either inorganic or organic dusts or to noxious gases. Epidemiologic surveys have succeeded in demonstrating an accelerated decline in lung function in many such workers - e.g., workers in plastics plants exposed to toluene diisocyanate, and carding room workers in cotton mills - suggesting that their occupational exposure contributes to their future disability.

Infection. Morbidity, mortality, and frequency of acute respiratory illnesses are higher in patients with chronic bronchitis. Many attempts have been made to relate these illnesses to infection with viruses, mycoplasmas, and bacteria. However, only the rhinovirus is found more often during exacerbations; that is to say, pathogenic bacteria, mycoplasmas, and viruses other than rhinovirus are found just as often between as during exacerbations. Epidemiologic studies, however, implicate acute respiratory illness as one of the major factors associated with the etiology as well as the progression of chronic airways obstruction. Cigarette smokers may either transitorily develop or worsen small-airways obstruction in association with even mild viral respiratory infections. There is also some evidence that severe viral pneumonia early in life may lead to chronic obstruction, predominantly in small airways [10].

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. In addition, 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. Thus a part of the familial aggregation may be related to home air pollution. However, some studies of monozygotic twins have suggested some genetic predisposition to the development of chronic bronchitis independent of personal or familial smoking habits and other indoor air pollution. The exact genetic mode of transmission, if it exists at all, is uncertain [15].

Alpha$_1$-Antitrypsin Deficiency. The protease inhibitor α_1-antitrypsin (αlAT) 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. Most members of the normal population have two M genes, designated as protease inhibitor type MM, and have serum αlAT levels in excess of 2,5 g/L. Several genes are associated with alterations in levels of serum alAT, but the most common ones associated with emphysema are the Z and S genes. Individuals who are homozygous ZZ or SS have serum levels often near 0 but always less than 0,5 g/L and develop severe panacinar emphysema in the third and fourth decades of life. The panacinar process predominates at the lung bases. Progressive dyspnea with minimal cough characterizes the clinical presentation, although chronic bronchitis is prominent in smokers. Given that protease inhibitors can be chemically synthesized or biologically produced in significant quantities and can be shown with intravenous infusion to restore the protease-antiprotease balance in liquid lavaged from the lungs of ZZ patients, it has been suggested that replacement therapy with α1AT should be of value in preventing the development of emphysema in these patients. Since replacement therapy was available before efficacy had been assessed, a prospective, randomized trial has not been possible. Through a national registry, a natural history study is underway from which it might be possible to evaluate the effects of therapy if the treated and untreated groups turn out to be sufficiently comparable at entry [9].

The MZ and MS heterozygotes have intermediate levels of serum αlAT (i.e., between 0.5 and 2.5 g/L); hence the genetic expression is that of an autosomal codominant allele. It is a matter of some controversy whether the heterozygous state is associated with lung function abnormalities. The matter is of some importance, since the heterozygous state is common, with incidence estimates varying between 5 and 14 percent of the general population.

The precise way in which antitrypsin deficiency produces emphysema is unclear. In addition to inhibition of trypsin, αlAT 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 [11].

The role of proteolytic enzymes in the induction of emphysema is not restricted to patients with αlAT 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. An assessment of the clinical efficacy of this inexpensive and nontoxic form of therapy in ex-smokers must await a large, prospective clinical trial [10].

New ACC/AHA/NHLBI Guidance on Lifestyle for CVD Prevention (guidelines on cholesterol, blood pressure, and obesity management in adults). Risk Factors for Atherosclerosis

Factor	Evidence for Causality	Modifiable	Comment
Hypercholesterolemia Low HDL level	Strong Strong	Yes	Varies inversely with plasma triglyceride level
Hypertension	Strong	Yes	
Male gender	Strong	No	
Diabetes mellitus	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
High lipoprotein (a) level	Strong	Modestly	Skewed distribution(see text)
Cigarette smoking	Good	Yes	
Post-menopausal state	Good	Possibly	Estrogen replacement therapy being evaluated
Hyperfibrinogenemia	Good	Possibly	Fibric acid derivatives may reduce
Hyperhomocysteinemia	Good	Yes	Some patients respond to folate supplementation
Physical inactivity	Good	Yes	
Obesity	Good	Yes	
Angiotensin converting enzyme polymorphism	Controversial	No	Homozygous deletion mutant associated with myocardial infractions

The aim of the lifestyle guidelines was to "reevaluate and update the concept of a healthy lifestyle," with the specific aim of preventing progression to cardiovascular disease in at-risk patients.

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

"Did not have the time or resources" to investigate other aspects of lifestyle and diet - namely calcium, magnesium, and alcohol intake; cardiorespiratory fitness; single behavioral intervention or multicomponent lifestyle interventions; the addition of lifestyle intervention to pharmacotherapy; and smoking. These may have "potential benefits".

The recommendations are broken out according to whether an adult in question has higher-than-desirable lipid profiles or higher-than-desirable blood-pressure levels, although the recommendations for both groups are very similar [13].

Low-Fat Diets Give Way to Mediterranean

The guidelines emphasize Mediterranean-style dietary patterns over a "low-fat dietary pattern," which is scarcely mentioned in the document, 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.

Also notable are the recommendations on sodium. The general recommendation to "reduce sodium intake" is given a level of evidence A (strong), in the NHLBI grading system or a class IA by the ACC/AHA grading system. By contrast, advice to further restrict sodium intake to 1500 mg/day as "desirable" is given level of evidence B (moderate)/class IIa-b.

The mean daily sodium intake in the US is about 3.5 g. "We're all consuming too much sodium and it's absolutely critical to reduce it." However, "accurately assessing sodium intake is extremely difficult and probably clouds the whole issue, as does the [use of a] specific target [Dr. Alice Lichtenstein**,** Tufts University, Boston, MA].

"What we really need to emphasize is that 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. Therefore, we really need a concerted effort and a partnership with public-advocacy organizations like the ACC and [the AHA] and the food industry to reduce sodium content in general across the board". "There is

evidence that people who cut back a gram a day do have lower blood pressures"[Dr. Alice Lichtenstein**,** Tufts University, Boston, MA].

These lifestyle recommendations are intended for people already identified as having a problem, and in the case of sodium recommendations, that means people with “prehypertension" or hypertension. "If the question is, does the [sodium intake] level make a difference? Yes, absolutely. Sodium reduction is an important element of successful blood-pressure lowering. What level should be achieved? I think as low as possible is beneficial, but targeted levels are supported *moderately* by the evidence that exists and should not be the initial message that we give to our patients at risk" [Dr. Alice Lichtenstein**,** Tufts University, Boston, MA].

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. The American College of Cardiology Foundation/American Heart Association (AHA) Task Force on Practice Guidelines, in a 2010 report on cardiovascular risk assessment in asymptomatic adults, recommends obtaining global risk scores (eg, Framingham Risk Score) and a family history of cardiovascular disease for cardiovascular risk assessment [9].

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:

Table 1

Basic Categories of Risk Factors for Future Cardiovascular Event

Category	Risk Factors
Nonmodifiable risk factors	Age, sex, family history, genetic
Modifiable risk factors	Smoking, atherogenic diet, alcohol intake, physical activity, dyslipidemias, hypertension, obesity, diabetes, metabolic syndrome
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

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 AHA suggests 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 [14].

In the following tables diabetes is excluded because it constitutes coronary artery disease risk equivalent.

Table 2

Framingham Point Scores by Age Group in Men

Age	Points
20-34	-9
35-39	-4
40-44	0
45-49	3
50-54	6
55-59	8
60-64	10
65-69	11
70-74	12
75-79	13

Table 3

Framingham Point Scores by Age Group and Total Cholesterol in Men

Total Cholesterol	Age 20-39	Age 40-49	Age 50-59	Age 60-69	Age 70-79
<160	0	0	0	0	0
160-199	4	3	2	1	0
200-239	7	5	3	1	0
240-279	9	6	4	2	1
280+	11	8	5	3	1

Table 4

Framingham Point Scores by Age and Smoking Status in Men

	Age 20-39	Age 40-49	Age 50-59	Age 60-69	Age 70-79
Nonsmoker	0	0	0	0	0
Smoker	8	5	3	1	1

Table 5

Framingham Point Scores by HDL level in Men

HDL	Points
60+	-1
50-59	0
40-49	1
< 40	2

Table 6

Framingham Point Scores by Systolic Blood Pressure and Treatment Status in Men

Systolic BP	If Untreated	If Treated
< 120	0	0
120-129	0	1
130-139	1	2
140-159	1	2
160+	2	3

Table 7

10-Year Risk by Total Framingham Point Scores in Men

Point Total	10-Year Risk
< 0	< 1%
0	1%
1	1%
2	1%
3	1%
4	1%
5	2%
6	2%
7	3%
8	4%
9	5%
10	6%
11	8%
12	10%
13	12%
14	16%
15	20%
16	25%
17 or more	≥30%

Table 8

Framingham Point Scores by Age Group in Women

Age	Points
20-34	-7
35-39	-3
40-44	0
45-49	3
50-54	6
55-59	8
60-64	10
65-69	12
70-74	14
75-79	16

Table 9

Framingham Point Scores by Age Group and Total Cholesterol in Women

Total Cholesterol	Age 20-39	Age 40-49	Age 50-59	Age 60-69	Age 70-79
<160	0	0	0	0	0
160-199	4	3	2	1	1
200-239	8	6	4	2	1
240-279	11	8	5	3	2
280+	13	10	7	4	2

Table 10

Framingham Point Scores by Age and Smoking Status in Women

	Age 20-39	Age 40-49	Age 50-59	Age 60-69	Age 70-79
Nonsmoker	0	0	0	0	0
Smoker	9	7	4	2	1

Table 11

Framingham Point Scores by HDL level in Women

HDL	Points
60+	-1
50-59	0
40-49	1
<40	2

Table 12

Framingham Point Scores by Systolic Blood Pressure and Treatment Status in Women

Systolic BP	If Untreated	If Treated
<120	0	0
120-129	1	3
130-139	2	4
140-159	3	5
160+	4	6

Table 13

10-Year Risk by Total Framingham Point Scores in Women

Point Total	10-Year Risk
< 9	< 1%
9	1%
10	1%
11	1%
12	1%
13	2%
14	2%
15	3%
16	4%
17	5%
18	6%
19	8%
20	11%
21	14%
22	17%
23	22%
24	27%
25 or more	≥30%

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 [16,17].

Screening guidelines

New guidelines from the American Heart Association/American College of Cardiology (AHA/ACC) recommend use of a revised calculator for the risk of developing a first atherosclerotic cardiovascular disease (ASCVD) event, which is defined as one of the following, over a 10-year period, in a person who was initially free from ASCVD:

- Nonfatal myocardial infarction;
- Death from coronary heart disease;
- Stroke (fatal or nonfatal).

For patients 20-79 years of age who do not have existing clinical ASCVD, the guidelines recommend assessing clinical risk factors every 4-6 years. For patients with low 10-year risk (< 7,5%), the guidelines recommend assessing 30-year or lifetime risk in patients 20-59 years old.

Regardless of the patient's age, clinicians should communicate risk data to the patient and refer to the AHA/ACC lifestyle guidelines, which cover diet and physical activity. For patients with elevated 10-year risk, clinicians should communicate risk data and refer to the AHA/ACC guidelines on blood cholesterol and obesity [8].

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 guidelines include initiation of lifestyle and drug management 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. The recent trials have failed to demonstrate an LDL cholesterol level below which coronary risk does not decrease.
- 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.
- 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.
- When LDL cholesterol levels do not require pharmacologic treatment, 20 mg of rosuvastatin significantly reduces 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%).

The 2013 AHA/ACC guidelines on the management of elevated blood cholesterol no longer specify LDL- and non-HDL-cholesterol targets for the primary and secondary prevention of atherosclerotic cardiovascular disease. The new guidelines identify four groups of primary- and secondary-prevention patients in whom efforts should be focused to reduce cardiovascular disease events and recommend appropriate levels of statin therapy for these groups [10].

Treatment recommendations include the following:

- In patients with atherosclerotic cardiovascular disease, or those with LDL cholesterol levels 190 mg/dL or higher (eg, due to familial hypercholesterolemia), and no contraindications, high-intensity statin therapy should be prescribed to achieve at least a 50% reduction in LDL cholesterol
- In patients aged 40 to 75 years of age with diabetes, a moderate-intensity statin that lowers LDL cholesterol by 30% to 49% should be used; in those patients who also have a 10-year risk of atherosclerotic cardiovascular disease exceeding 7.5%, a high-intensity statin is a reasonable choice
- In individuals aged 40 to 75 years without cardiovascular disease or diabetes but with a 10-year risk of clinical events >7.5% and an LDL-cholesterol level of 70-189 mg/dL, a moderate- or high-intensity statin should be used

Before therapy is initiated, the following potential **secondary causes of dyslipidemia** should be considered based on the associated dyslipidemia:

- High LDL: Hypothyroidism, nephrotic syndrome, primary biliary cirrhosis, and anorexia nervosa
- Hypertriglyceridemia: Diabetes mellitus, chronic kidney disease, alcoholism, pregnancy, hypothyroidism
- Low HDL: Diabetes mellitus, cigarette smoking, obesity

Table 14

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

Risk Category	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
Lower risk - 0-1 risk factor‡	< 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

Data on the impact of triglycerides on CHD events is not as clearly evident. However, the elevated triglyceride levels are an independent risk factor for CHD, and data on the benefits of reducing triglyceride levels were demonstrated by using the drug gemfibrozil (fibric acid derivative) in a population with low HDL level (< 40 mg/dL).

Non-HDL cholesterol

In patients with mixed dyslipidemia (elevated LDL cholesterol and triglyceride levels), non-HDL cholesterol is a useful measurement. Non-HDL cholesterol represents very LDL cholesterol plus LDL cholesterol, both of which are apo-B-100-containing atherogenic lipoprotein fractions. In hypertriglyceridemic individuals, non-HDL cholesterol goals are 30 mg/dL higher than the corresponding LDL goals, representing a triglyceride goal of 150 mg/dL. Non-HDL cholesterol can be measured in a nonfasting state. Non-HDL cholesterol was found to be more predictive of future CV events than LDL in several trials, probably because it measures both of the atherogenic apo-B-containing fractions. LDL and total cholesterol/HDL cholesterol ratios are also strongly predictive of CVD risk [12].

Secondary prevention

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. As described earlier, 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.

Compared with placebo or statin monotherapy, evacetrapib as monotherapy or in combination with statins increased HDL-C levels and decreased LDL-C levels. However, further investigation is warranted [17].

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. Compelling data from meta-analyses indicate that a 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.

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. Because data is lacking for dosing, 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 [17].

Diet. Two types of dietary guidelines exist.

The first type recommends specific quantities of macronutrients, such as < 200 mg of cholesterol per day and < 7% of calories as saturated fat, as in the AHA Step 2 diet.

A second type recommends the consumption and exclusion of specific foods, often in combination. An example is the recommendation to eat the following foods to lower cholesterol: stanol/sterol ester margarines, soy products, soluble fiber, and almonds or walnuts. This specific food portfolio recommendation has been found to lower LDL cholesterol more than an AHA Step 2 approach (29% vs 8%, respectively).

The Third type includes a more intense and effective eating plan than previously advocated. Specific recommendations are as follows: 1) Saturated fat, < 7% of total calories, 2) polyunsaturated fat, about 10% of total calories, 3) monounsaturated fat, about 20% of total calories, 4) total fat, about 25-35% of total calories, 5) carbohydrates, about 50-60%, 6) fiber, about 20-30 g/d, 7) protein, about 15% of total calories, and 8) cholesterol < 200 mg/d.

- In general, diets containing unsaturated fats, whole grains, fruits, vegetables, fish, and moderate alcohol are optimal for preventing heart disease. The revised AHA guidelines place emphasis on foods and an overall eating pattern, rather than on percentages of food components such as fat [15].

The Mediterranean diet is characterized by high consumption of monounsaturated fatty acids, primarily from olives and olive oil, and encourages daily consumption of fruits, vegetables, whole grain cereals, and low-fat dairy products; weekly consumption of fish, poultry, tree nuts, and legumes; a relatively low consumption of red meat, approximately twice a month; as well as a moderate daily consumption of alcohol, normally with meals. Adherence to the diet was associated with reduced risk of metabolic syndrome and reduced HDL-cholesterol levels and triglycerides levels. The results are of considerable public health importance because this dietary pattern can be easily adopted by all population groups and various cultures and is cost-effective.

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 [8].

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

Alcohol

Moderate alcohol consumption (1-2 drinks per day) is associated with a reduced overall and CHD-related mortality compared with both abstinence and heavy drinking.

However, alcohol raises HDL (by stimulating the hepatic production of apo-A-I and A-II), stimulates fibrinolysis, reduces fibrinogen levels, reduces inflammation, and inhibits platelet activation. Moreover, the personal and social risks of alcohol intake (eg, violence, trauma, car accidents, binge drinking) appear to be higher in younger individuals.

In the U.S., additional antioxidant effects have been attributed to red wine, but the consumption of other alcoholic beverages is associated with a somewhat lower or similar reduction in CHD risk, and the pattern and amount of alcohol intake appears to be more important than the type [11].

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

An estimated 40% of Americans use herbal remedies (alternative forms of health care). Inquiry about the use of herbals is a component of good medical care, especially in cardiovascular medicine [11].

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 and have been banned in the U.S.

Summary of General Nutritional Recommendations

Achieve and maintain ideal body weight by limiting foods high in calories and low in nutrition, including those high in sugar, such as soft drinks and candy.

Eat a variety of fruits; vegetables; legumes; nuts; soy products; low-fat dairy products; and whole grain breads, cereals, and pastas.

Eat baked or broiled fish at least twice per week.

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.

Avoid foods high in saturated and trans-fats, such as red meat, whole milk products, and pastries.

Limit alcohol consumption to no more than 2 drinks per day for a man or 1 drink per day for a woman.

Eat less than 6 g of salt or < 2400 mg/d of sodium [15].

Physical Activity

Reduced physical activity is a major risk factor for CVD. In elderly individuals, the risk of MI is reduced by as much as 50% by walking 30 min daily. The vigorous- and moderate-intensity activity among middle-aged men were associated with lower risk of disease. On the other hand, low fitness in mid-life was associated with higher lifetime risk for CVD death [9].

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.
- The most recent scientific statement from the AHA provides recommendations on implementing the most efficacious and effective physical activity and dietary strategies in adults.

Elevated waist circumference and physical inactivity are associated with an increased risk of coronary heart disease [10].

Smoking

Of all the lifestyle modifications recommended to prevent CVD, 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 [8].

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

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 [16].

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 [12].

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. The goal is BP < 140/90 mm Hg or < 130/80 mm Hg if the patient has diabetes or chronic kidney disease [16].

For all patients, initiate or maintain lifestyle modification, weight control, increased physical activity, alcohol moderation, sodium reduction, and increased consumption of fresh fruits, vegetables, and low-fat dairy products. **I (B)**

For patients with BP ≥140/90 mm Hg (or 130/80 mm Hg for individuals with chronic kidney disease or diabetes), as tolerated, add BP medication, treating initially with beta-blockers and/or ACE inhibitors, with addition of other drugs, such as thiazides, as needed to achieve goal blood pressure. **I (A)**

Diet that include nonhydrogenated unsaturated fats as the predominant form of dietary fat, whole grains as the primary form of carbohydrate, fruits and vegetables,

omega-3 fatty acids (from fish, fish oil supplements, or plant sources) offer significant protection against coronary heart disease.

Light-to-moderate alcohol consumption (5-25 g/d) has been significantly associated with a lower incidence of cardiovascular and all-cause mortality in patients with cardiovascular disease. A significant maximal protection against cardiovascular mortality is consumption of approximately 26 g/d and maximal protection against mortality from any cause in the range of 5-10 g/d [13].

Lipid management

The goal is LDL cholesterol < 100 mg/dL; if triglyceride levels are ≥200 mg/dL, non-HDL cholesterol should be < 130 mg/dL. (Non-HDL cholesterol is total cholesterol minus HDL cholesterol.). The following measures should be taken for all patients:

- Start dietary therapy. Reduce the intake of saturated fats (to < 7% of total calories), trans-fatty acids, and cholesterol (to < 200 mg/d). **I (B)**
- Adding plant stanol/sterols (2 g/d) and viscous fiber (>10 g/d) will further lower LDL cholesterol level.
- Promote daily physical activity and weight management. **I (B)**
- Encourage increased consumption of omega-3 fatty acids in the form of fish or in capsule form (1 g/d) for risk reduction. (Pregnant and lactating women should limit their intake of fish to minimize exposure to methylmercury.)
- For treatment of elevated triglyceride levels, higher doses are usually necessary for risk reduction. **IIb (B)**

In addition, 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 [14].

Assess fasting lipid profile in all patients and within 24 hours of hospitalization for those with an acute cardiovascular or coronary event. For hospitalized patients, initiate lipid-lowering medication as recommended below before discharge according to the following schedule:

- LDL cholesterol level should be < 100 mg/dL. **I (A)**
- Further reduction of LDL cholesterol level to < 70 mg/dL is reasonable. **IIa (A)**
- If baseline LDL cholesterol level is 100 mg/dL, initiate LDL-lowering drug therapy. **I (A)**
- If the patient is on treatment and LDL cholesterol is 100 mg/dL, intensify LDL-lowering drug therapy (may require LDL-lowering drug combination [standard dose of statin with ezetimibe, bile acid sequestrant, or niacin]). **I (A)**

- If baseline LDL cholesterol level is 70-100 mg/dL, treating to LDL cholesterol level of < 70 mg/dL is reasonable. **IIa (B)**
- If triglyceride levels are 200-499 mg/dL, non-HDL cholesterol level should be < 130 mg/dL. **I (B)**
- Further reduction of non-HDL cholesterol level to < 100 mg/dL is reasonable. **IIa (B)**

Therapeutic options to reduce non-HDL cholesterol level are as follows:

- More intense LDL cholesterol-lowering therapy, **I (B)**
- Niacin (after LDL cholesterol–lowering therapy), **IIa (B)**
- Fibrate therapy (after LDL cholesterol–lowering therapy), **IIa (B)**

If triglyceride levels are 500 mg/dL, therapeutic options to prevent pancreatitis are fibrate or niacin before LDL-lowering therapy, and treat LDL cholesterol level to goal after triglyceride-lowering therapy. Achieve non-HDL cholesterol level of < 130 mg/dL if possible. **I (C)** (Patients with very high triglycerides should not consume alcohol. The use of bile acid sequestrant is relatively contraindicated when triglycerides are >200 mg/dL.) (The combination of high-dose statin plus fibrate can increase risk for severe myopathy. Statin doses should be kept relatively low with this combination. Dietary supplement niacin must not be used as a substitute for prescription niacin.) [11].

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.

When LDL-lowering medications are used, obtain at least a 30-40% reduction in LDL cholesterol levels. If LDL cholesterol < 70 mg/dL is the chosen target, consider drug titration to achieve this level to minimize side effects and cost. When LDL cholesterol < 70 mg/dL is not achievable because of high baseline LDL cholesterol levels, it generally is possible to achieve reductions of >50% in LDL cholesterol levels by either satins or LDL cholesterol-lowering drug combinations.

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 [17].

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

Physical activity

The goal of low, moderate, and high physical activity is 30 minutes, 7 days per week (minimum 5 d/w).

- For all patients, assess risk with a physical activity history and/or an exercise test to guide prescription. **I (B)**
- For all patients, encourage 30-60 minutes of moderate-intensity aerobic activity (eg, brisk walking) on most, preferably all, days of the week, supplemented by an increase in daily lifestyle activities (eg, walking breaks at work, gardening, household work). **I (B)**
- Encourage resistance training 2 days per week. **IIb (C)**

Advise medically supervised programs for high-risk patients (eg, recent acute coronary syndrome or revascularization, heart failure). **I (B)** [17].

Weight management

The goal of weight management is body mass index of 18.5-24.9 kg/m^2 and waist circumference of < 40 inches in men and < 35 inches in women. The AHA released a Scientific Statement regarding weight management strategies for busy ambulatory surgery settings.

- Assess body mass index and/or waist circumference on each visit and consistently encourage weight maintenance or reduction through an appropriate balance of physical activity, caloric intake, and formal behavioral programs when indicated to maintain or achieve a body mass index between 18.5 and 24.9 kg/m^2. **I (B)**
- If waist circumference (measured horizontally at the iliac crest) is 35 inches in women and 40 inches in men, initiate lifestyle changes and consider treatment strategies for metabolic syndrome as indicated. **I (B)**
- The initial goal of weight loss therapy should be to reduce body weight by approximately 10% from baseline. With success, further weight loss can be attempted if indicated through further assessment. **I (B)**

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.

Diabetes management

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

- Initiate lifestyle and pharmacotherapy to achieve near-normal HbA1c level. **I (B)**
- Begin vigorous modification of other risk factors (eg, physical activity, weight management, BP control, and cholesterol management) as recommended above. **I (B)**
- Coordinate diabetic care with the patient's primary care physician or endocrinologist. **I (C)**

Antiplatelet agents and anticoagulants

- Start aspirin 75-162 mg/d, and continue indefinitely in all patients unless contraindicated. **I (A).** For patients undergoing coronary artery bypass grafting, aspirin should be started within 48 hours after surgery to reduce saphenous vein graft closure. Dosing regimens ranging from 100-325 mg/d appear to be efficacious. Doses higher than 162 mg/d can be continued for up to 1 year. **I (B)**
- Start and continue clopidogrel 75 mg/d in combination with aspirin for up to 12 months in patients after acute coronary syndrome or percutaneous coronary intervention with stent placement (at least 1 month, but ideally 12 months, for bare metal stent; at least 12 months for drug-eluting stents). **I (B).** Patients who have undergone percutaneous coronary intervention with stent placement should initially receive higher-dose aspirin at 162-325 mg/d for 1 month for bare metal stent, 3 months after sirolimus-eluting stent, 6 months after paclitaxel-eluting stent, after which daily long-term aspirin use should be continued indefinitely at a dose of 75-162 mg. **I (B)**
- Manage warfarin to international normalized ratio of 2.0-3.0 for paroxysmal or chronic atrial fibrillation or flutter, and in post-MI patients when clinically indicated (eg, atrial fibrillation, left ventricular thrombus). **I (A)**
- Use of warfarin in conjunction with aspirin and/or clopidogrel is associated with increased risk of bleeding and should be monitored closely. **I (B)**

A nationwide cohort study suggests NSAID treatment duration in patients with prior myocardial infarction, whether short term or long term, is associated with increased risk of death and recurrent myocardial infarction in patients with prior myocardial infarction and is not recommended for this population. NSAID use should be limited from a cardiovascular safety point of view [14,15].

Renin, angiotensin, and aldosterone system blockers. Consider the following with ACE inhibitors:

- Start and continue indefinitely in all patients with left ventricular ejection fraction ≥40% and in those with hypertension, diabetes, or chronic kidney disease, unless contraindicated. **I (A)**
- Consider for all other patients. **I (B)**
- Among lower-risk patients with normal left ventricular ejection fraction in whom cardiovascular risk factors are well controlled and revascularization has been performed, use of ACE inhibitors may be considered optional. **IIa (B)**

Consider the following with angiotensin receptor blockers:

- Use in patients who are intolerant of ACE inhibitors and have heart failure or have had an MI with left ventricular ejection fraction ≤40%. **I (A)**
- Consider in other patients who are intolerant of ACE inhibitors. **I (B)**
- Consider use in combination with ACE inhibitors in systolic dysfunction heart failure. **IIb (B)**

Aldosterone blockade are used in post-MI patients without significant renal dysfunction (creatinine should be >2.5 mg/dL in men and > 2.0 mg/dL in women) or hyperkalemia (potassium should be < 5 mEq/L), who are already receiving therapeutic doses of an ACE inhibitor and beta-blocker, have left ventricular ejection fraction ≤40%, and have either diabetes or heart failure. One study suggests that higher dietary potassium intake is associated with lower rates of stroke and may reduce the risk of coronary heart disease. **I (A)**

Beta-blockers

- Start and continue indefinitely in all patients who have had MI, ACS, or LV dysfunction with or without heart failure symptoms, unless contraindicated. **I (A)**

Consider chronic therapy for all other patients with coronary or other vascular disease or diabetes, unless contraindicated. **lla (C)** [8,9].

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.

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 [15].

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.

XIII. Tasks for final control

1. What index authenticity of middle arithmetic is determined by:
   A. fashions;
   B. criterion of authenticity;
   C. errors of representative;
   D. standard deviation;
   E. interval.

2. By what index it is possible to define a difference between two middle indexes:
   A. fashions;
   B. criterion of the Student authenticity;
   C. errors of representative;
   D. standard deviation;
   E. interval.

3. Which degree of authenticity of middle index, if his oscillation is evened ±2m:
   A. 10%;
   B. 68%;
   C. 95%;
   D. 99%;
   E. 100%.

4. That from transferred is not the element of variation row:
   A. fashion;
   B. median;
   C. error of representative;
   D. amplitude;
   E. variant.

5. Which must be degree of authenticity of middle indexes at medical biological researches:
   A. 10%;
   B. 68%;
   C. 95%;
   D. 99%;
   E. 100%.

6. How graphicly to represent the dynamics of birth-rate for 5 years:

A. by a linear diagram;
B. by a radial diagram;
C. by cartogram;
D. by a sector diagram;

7. In which from the transferred cases the coefficient of correlation can be considered reliable:

A. t=0.4;
B. t=1,8;
C. t=2,6;
D. t=3,7.

8. How to describe communication between the phenomena, if the coefficient of correlation is evened –0,62:

A. communication reverse middle crowd conditions;
B. communication reverse weak;
C. communication reverse high;
D. communication direct of middle crowd conditions;
E. communication is direct weak.

9. What stage of statistical research registration and account of signs of the explored phenomenon is carried out on:

A. on the first;
B. on the second;
C. on the third;
D. on fourth.

10. What characterizes a «group» statistical table:

A. it is characterized by a few interdependent signs;
B. it is characterized by one sign;
C. it is characterized by a few signs unconnected between itself.

Answers:

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

TOPIC 4

The organization of out-of-hospital therapeutic help in case of the most widespread diseases. The organization of the day hospital and home care. The basis of expertise of disability.

I. Theme actuality. The reformation of primary medical help on principles of family medicine allowed approaching a medical help to the rural population by opening of out-patient's clinics, reducing of radius of service, increasing of doctor's visit number. The increasing of patient's number, the organization of day hospital and home care lead to decreasing of admission to the hospitals. These measures have considerable economic effect.

The input of model of family medicine in the system of medical service of population in Ukraine allows changing interrelations between medical establishments. The family out-patient's clinics are of primary importance in reducing patient's visit number and responsibility of physician for patient.

For therapeutic diseases the patient's out-patient care allows to reduce the duration of treatment, realize effective preventive and rehabilitation measures. And reduction of temporary disability has economic efficiency.

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

III. Concrete purposes of the module: to draw the plan of ambulatory patient examination and treatment in the case of cardiovascular, bronchopulmonary, gastro-intestinal, urogenital, musculoskeletal system, and blood diseases, the principles of expertise of disability.

IV. A student must be able to conduct the complains, medical history, life history, objective examination of patient, determine risk factors of most widespread diseases, distinguish symptoms and syndromes of diseases, to make differential diagnosis, to prescribe treatment, to expertise disability.

V. Task for initial independent training

1. A primary medical help provides for:
   A. treatment in the specialized departments;
   B. treatment of the most widespread diseases;
   C. patient referral to treatment to specialized and high specialized medical establishments;
   D. making diagnosis, hygienic education of population;
   E. consultation of general practitioner, making diagnosis, patient referral to treatment to specialized and high specialized medical establishments.

2. The basic tasks of medical rehabilitation are:
   A. help to choice the new profession;
   B. acquirement to using a transport and auxiliary measures;
   C. adaptation to the everyday life;
   D. maximal renewal of capacity of man;
   E. medical-labour expertise

3. What kind of morbidity is typical for group of high and long being ill:
   A. general morbidity;
   B. acute infectious diseases;
   C. important non-epidemic morbidity;
   D. morbidity with the temporary disability;
   E. hospitalized morbidity.

4. The secondary medic is:
   A. The appointment of patient for the specialized and high-specialized medical establishments;
   B. making simple diagnosis, hygienic education of population;
   C. consultation of general practitioner, simple diagnosis, appointment of patient for the specialized and high-specialized medical establishments;
   D. subspecialty consultation, diagnosis and treatment by specialists;
   E. treatment of most widespread diseases.

5. Which indexes characterize morbidity with the temporary disability?
   A. absolute number of cases of temporary disability;
   B. absolute number of days of temporary disability;
   C. average duration of one case of temporary disability;
   D. primary morbidity;
   E. prevalence of diseases.

6. The tasks of tertiary medical help are:
   A. Making difficult diagnosis and treatment of rare diseases;
   B. realization of preventive measures;
   C. realization of the health centre system;
   D. making simple diagnosis, hygienic education of population;
   E. treatment of most widespread diseases.

7. The patient is prepared to the discharge from the hospital. She received treatment for hypertensic crisis. The patient works as weaver of weaving factory. How you'll expert her disability?

A. after out-patient treatment you'll recommend the change of job;
B. you'll close the medical certificate and send her to work;
C. you'll close the medical certificate and recommend the change of work;
D. you'll continue the medical certificate for one month;
E. after out-patient treatment you'll recommend to re-start work.

8. The patient with disability was under long-term follow-up by family doctor. Who will appoint patient to medico-social commission of expert?

A. head of out-patient department;
B. the medical advisory commission;
C. doctor specialist;
D. family doctor;
E. head of hospital department.

9. In rural out-patient's clinic works only one doctor. The mechanization expert was treated in this out-patient's clinic. For what period the doctor can give out the medical certificate?

A. Maximum for 30 days with following appointment to medical advisory commission;
B. for all period of temporary disability;
C. Maximum for 6 days with following appointment to medical advisory commission;
D. Maximum for 10 days with following appointment to medical advisory commission;
E. Maximum for 14 days with following appointment to medical advisory commission.

10. The worker of private firm had acute respiratory viral infection. He saw a family doctor, which was established the fact of temporary disability. However, the FD refused to give out the medical certificate, because a patient worked in private firm. If doctor had to give out medical certificate to the workers?

A. yes, to give out regardless of ownership;
B. no, to give out only to the workers of public institutions;
C. no, to give out only in the case of temporary disability;
D. yes, to give out if there are guarantee for payment of firm owner;
E. any document was given out.

Answers:

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

VI. Basic questions after a theme:

Co-operation of family doctor with the secondary and tertiary levels of medical care.

The indication and contraindication for out-patient treatment at primary level, day hospital and at home care.

Influence of family on the recovery and reduction of risk of development of pathologic condition.

Realization of after-hospital care and rehabilitation in the outpatient setting.

Realization of medico-social expertise of disability in the outpatient setting.

Design the patient's management program, taking into account risk factors, psychological state and family influence, realize a preventive work, early diagnosis, treatment and rehabilitation of medical patients.

VII. Practical skills: employment is conducted in a family out-patient's clinic, students together with family doctors conduct the primary inspection of patients, compose the individual examination plans and management program, the principles of after-hospital care and rehabilitation in the outpatient setting, medico-social expertise of disability.

1. To appoint the patient with arteriosclerosis obliterans of lower limbs to consultation of angiosurgeon.
2. To fill a medical certificate in different situation.
3. To prepare document for sanatorium-resort treatment of patient.
4. To fill appointment card for hospitalization in the case of out-of-hospital pneumonia.
5. To make the program of out-patient treatment for 45-years-old man with arterial hypertension, II stage, 2 degrees, moderate risk.
6. To make the program of out-patient treatment for 65-years-old women with ischemic heart disease, postinfarction cardiosclerosis, permanent atrial fibrillation, heart failure I stage, II functional class.
7. To make the program of out-patient treatment for 55-years-old man with a diabetes mellitus, 2 type, moderately severe, subcompensation stage.
8. To make the program of out-patient treatment for 30-years-old man with chronic superficial gastritis associated from H. pylori.
9. To make the program of out-patient treatment for 48-years-old man with chronic obstructive pulmonary disease, II stage.
10. To make the program of out-patient treatment for 25-years-old women with a chronic secondary pyelonephritis, latent clinical course, pre-hypertension stage.

Independent work: preparation to practical studies - 4 hours.

VIII. The plan and organizational structure of practical training

№	Stage	Hours, min	Educational materials		Place of realization of studies
			Facilities of studies	Equipment	
1	Control of initial level	15 min	Tests		Classroom
2	Analysis of theme	90 min	Oral test		Classroom
3	Practical work	115 min	Out-patients case record		Family out-patient's clinic
4	Current control of knowledge	15 min	Situational tasks		Classroom
5	Summation of studies	5 min			Classroom
6	Independent work	4 hours	The individual preparation to practical studies		Classroom

IX. The content of theme

Approach to the patient with heart disease

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. 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 [7].

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 cardiocirculatory 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 [1].

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.

Dyspnea, one of the cardinal manifestations of diminished cardiac reserve, is not limited to heart disease but is also characteristic of conditions as diverse as pulmonary disease, marked obesity, and anxiety. Chest discomfort may result from causes other than myocardial ischemia. Whether heart disease is responsible for these symptoms can frequently be determined by carrying out a careful clinical examination. Noninvasive testing using ECG at rest and during exercise, echocardiography, roentgenography, and myocardial imaging usually provides important additional information to permit the correct interpretation of symptoms; more specialized invasive examinations (catheterization and angiography) are occasionally necessary.

Diagnosis. The elements of a complete cardiac diagnosis include consideration of:

1. The underlying etiology: congenital, infectious, hypertensive, or ischemic in origin disease.

2. The anatomic abnormalities. Which chambers are involved? Which valves are affected? Is there pericardial involvement? Has there been a myocardial infarction?

3. The physiologic disturbances. Is an arrhythmia present? Is there evidence of congestive heart failure or of myocardial ischemia?

4. The extent of functional disability. How strenuous is the physical activity required to elicit symptoms? The latter should be evaluated in the light of the intensity of therapy.

The identification of myocardial ischemia as the etiology of a patient's exertional chest discomfort is of great clinical importance. The recognition of ischemia is insufficient to formulate a therapeutic strategy or prognosis until the underlying anatomic abnormalities responsible for the myocardial ischemia (coronary atherosclerosis or aortic stenosis) are identified and a judgment made as to whether other physiologic disturbances that cause an imbalance between myocardial oxygen supply and demand, such as severe anemia, thyrotoxicosis, or supraventricular tachycardia, play a contributory role. The extent of functional disability is a determinant of whether medical or interventional therapy is utilized [1,6].

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.

Family History. Familial clustering is common in many forms of heart disease. Genetic transmission may occur, as in hypertrophic cardiomyopathy, the Marfan syndrome, and sudden death associated with a prolonged QT syndrome. In patients with essential hypertension or coronary atherosclerosis, the genetic component may be less obvious but is also of considerable importance. Familial clustering of cardiovascular diseases may occur not only on a genetic basis but also may be related to familial dietary or behavior patterns, such as excessive ingestion of salt or calories or cigarette smoking [4].

Assessment of Functional Impairment. When an attempt is made to determine the severity of functional impairment in a patient with heart disease, it is helpful to ascertain with as much precision as possible the level of activity. Thus breathlessness that occurs after running up two long flights of stairs denotes far less functional impairment than similar symptoms occurring after taking a few steps on the level. Also, the degree of customary physical activity at work and during recreation should be considered. The development of two-flight dyspnea in a marathon runner may be far more significant than the development of one-flight dyspnea in a previously sedentary person. Similarly, the history must include a detailed consideration of the patient's therapeutic regimen. For example, the persistence or development of edema, breathlessness, and other manifestations of heart failure in a patient whose diet is rigidly restricted in sodium content and who is receiving optimal doses of diuretics is far more grave than the development of similar manifestations of heart failure in the absence of these measures

Electrocardiogram. Although the ECG is an invaluable aspect of every cardiovascular examination, with the exception of the identification of arrhythmias and of many instances of acute myocardial infarction, it rarely permits establishment of a specific diagnosis. In the absence of other abnormal findings, electrocardiographic changes must not be over-interpreted. The range of normal ECG findings is wide, and the tracing can be affected significantly by many noncardiac factors, such as age, body habits, and serum electrolyte concentrations [4].

Natural History. Cardiovascular disorders often present acutely, as in a previously asymptomatic patient with extensive coronary atherosclerosis that develops an acute myocardial infarction or the previously asymptomatic patient with hypertrophic cardiomyopathy whose first clinical manifestation is syncope or even sudden death. In both instances, the alert physician may recognize the patient at risk of these complications long before they occur and can often take measures to prevent their occurrence. For example, the patient with acute myocardial infarction may well have

had risk factors for atherosclerosis for many years. Their elimination or reduction might have delayed or even prevented the infarction. Similarly, the patient with hypertrophic cardiomyopathy may have had the familial form of this disorder, and a careful family history might have led to an echocardiography examination and the recognition of the condition long before the acute manifestations [6].

Pitfalls in cardiovascular medicine

1. Failure by the *non-cardiologist* to recognize cardiac manifestations of systemic illnesses. Examples of the latter are:

a) the Down syndrome (associated with endocardial cushion defect);

b) bony abnormalities of the upper extremities (associated with atrial septal detect in the Holt-Oram syndrome);

c) muscular dystrophies (associated with cardiomyopathy);

d) hemochromatosis and glycogen storage disease (associated with myocardial infiltration and restrictive cardiomyopathy);

e) congenital deafness (associated with prolonged QT interval and serious cardiac arrhythmias);

f) Raynaud's disease (associated with primary pulmonary hypertension and coronary vasospasm);

g) connective tissue disorders i.e., the Marfan syndrome, Ehlers-Danlos and Hurler syndrome and related disorders of mucopolysaccharide metabolism (aortic dilatation, prolapsed mitral valve, a variety of arterial abnormalities);

h) acromegaly (hypertension, accelerated coronary atherosclerosis, conduction defects, cardiomyopathy); hyperthyroidism (heart failure, atrial fibrillation);

j) hypothyroidism (pericardial effusion, coronary artery disease);

k) rheumatoid arthritis (pericarditis, aortic valve disease);

i) scleroderma (cor pulmonale, myocardial fibrosis, pericarditis);

m) systemic lupus erythematosus (valvulitis, myocarditis, pericarditis);

n) sarcoidosis (arrhythmias, cardiomyopathy);

o) exfoliative dermatitis (high-output heart failure).

In patients with systemic disorders a detailed clinical and noninvasive examination of the cardiovascular system should be carried out to identify cardiovascular involvement [5].

2. Failure by the cardiologist to recognize an underlying systemic illness among patients with a cardiac disorder. Patients known or suspected of having heart disease require a detailed general assessment and a search for the frequent *non-cardiac* manifestations of systemic disorders with cardiovascular manifestations. For example, infective endocarditis should be considered in patients with known congenital or valvular heart disease with fever, anemia, or albuminuria. A cardiovascular abnormality may provide the clue critical to the recognition of some systemic disorders. For

instance, in an elderly person, unexplained atrial fibrillation may provide the first clue to the diagnosis of thyrotoxicosis.

3. Overreliance and overutilization of laboratory tests, particularly invasive techniques for the examination of the cardiovascular system. Catheterization of the right and left sides of the heart, selective angiography, and coronary arteriography provide precise diagnostic information under many circumstances. For example, they aid in establishing a specific anatomic diagnosis and in determining the physiologic consequences of the abnormalities in patients with chest pain of uncertain cause in whom ischemic heart disease is suspected, and in determining the functional significance of valvular abnormalities in patients with rheumatic heart disease being considered for surgical treatment. Although a great deal of attention has been lavished on these specialized examinations, it should be recognized that they serve to *supplement,* not *supplant,* a careful examination carried out by clinical and noninvasive techniques. Sometimes coronary arteriography is carried out in patients with chest pain suspected of having ischemic heart disease instead of taking a careful history; although coronary arteriography may establish whether the coronary arteries are obstructed, the results often do not provide a definite answer to the question of whether a patient's complaint of chest pain is clearly attributable to coronary arteriosclerosis. Catheterization of the left side of the heart is all too frequently employed to determine whether operative treatment of valvular disease is indicated, even before the patient has had a trial of medical therapy.

These invasive tests should be carried out only if, after detailed clinical examination and assessment by noninvasive tests, the results of the invasive examination can be expected to modify or aid in the patient's management [6].

Treatment

1. In the absence of evidence of heart disease, a clear, definitive statement to that effect should be made and the patient should *not* be asked to return at intervals for repeated examinations.

2. If there is no evidence for disease, such continued attention may lead to the patient developing inappropriate anxiety and fixation on the heart.

If there is no evidence of cardiovascular disease but the patient has one or more risk factors for the development of ischemic heart disease, a plan for their reduction should be developed and the patient should be retested at intervals to assess that he or she is complying and that these risk factors are in fact being reduced.

3. Asymptomatic or mildly symptomatic patients with valvular heart disease that is anatomically severe should be evaluated periodically, every 6 to 12 months, by clinical and noninvasive examinations. Early signs of deterioration of ventricular function can be detected in this manner and in appropriate patients may signify the need

for cardiac catheterization and surgical treatment before the development of disabling symptoms, irreversible myocardial damage, and an excessive risk of surgical treatment.

4. It is critical to establish clear criteria for deciding on the form of treatment (medical, angioplasty, or surgical revascularization) in patients with ischemic heart disease. Mechanical revascularization represents a major therapeutic advance in the treatment of this most common form of heart disease, but operation has probably been employed too widely in the U.S.; the mere presence of angina pectoris and/or the demonstration of critical coronary arterial narrowing at angiography should not reflexly evoke a decision to treat the patient surgically or by angioplasty [1,2].

Physical examination of the cardiovascular system is a low-cost method for assessing the cardiovascular system. First, the FD appearance should be evaluated. The patient may appear tired because of a chronic low cardiac output; the respiratory rate may be rapid in cases of pulmonary venous congestion. Central cyanosis, often associated with clubbing of the fingers and toes, indicates right-to-left cardiac or extracardiac shunting or inadequate oxygenation of blood by the lungs. Cyanosis in the distal extremities, cool skin, and creased sweating result from vasoconstriction in patients with severe heart failure. Noncardiovascular details can be equally important (the diagnosis of infective endocarditis is highly likely in patients with petechiae, Osier's nodes).

The blood pressure should be taken in both arms and with the patient supine and upright; the heart rate should be timed for 30 s. Orthostatic hypotension and tachycardia may indicate a reduced blood volume, while resting tachycardia may be due to heart failure.

Examination of the optic fundi is essential: the retinal vessels may show evidence of systemic hypertension, arteriosclerosis, or embolism. The latter may result from atherosclerosis in larger arteries (e.g., the carotid) or may represent a complication of valvular heart disease (e.g., endocarditis).

Palpation of the peripheral arterial pulses in the upper and lower extremities is necessary to define the adequacy of systemic blood flow and to detect the presence of occlusive arterial lesions. It is also important to examine both legs for evidence of edema, varicose veins, or thrombophlebitis. The cardiovascular examination includes careful evaluation of both the carotid arterial and the jugular venous pulses, as well as deliberate precordial palpation and attentive cardiac auscultation [7].

Approach to the patient with disease of the respiratory system

Patients with disease of the respiratory system generally present because of symptoms, an abnormality on a chest radiograph, or both. A set of diagnostic possibilities often is suggested by the initial problems at presentation, including the particular symptoms and the appearance of any radiographic abnormalities. The

differential diagnosis is then refined on the basis of additional information gleaned from physical examination, pulmonary function testing, additional imaging studies, and bronchoscopic examination [7].

Clinical presentation

History. Dyspnea (shortness of breath) and cough are the primary presenting symptoms for patients with respiratory system disease. Less common symptoms include hemoptysis (the coughing up of blood) and chest pain, often with a pleuritic quality.

Dyspnea. When evaluating a patient with shortness of breath, one should first determine the time course over which the symptom has become manifest. Patients who were well previously and developed *acute* shortness of breath (over a period of hours to days) can have acute disease affecting the airways (an acute attack of asthma), the pulmonary parenchyma (acute pulmonary edema or an acute infectious process such as a bacterial pneumonia), the pleural space (a pneumothorax), or the pulmonary vasculature (a pulmonary embolus).

A *subacute* presentation (over days to weeks) can suggest an exacerbation of preexisting airways disease (asthma or chronic bronchitis), a parenchymal infection or a noninfectious inflammatory process that proceeds at a relatively slow pace (*Pneumocystis carinii* pneumonia in a patient with AIDS, mycobacterial or fungal pneumonia, Wegener's granulomatosis, eosinophilic pneumonia, bronchiolitis obliterans with organizing pneumonia, and many others), neuromuscular disease (Guillain-Barre syndrome, myasthenia gravis), pleural disease (pleural effusion from a variety of possible causes), or chronic cardiac disease (congestive heart failure).

A *chronic* presentation (over months to years) often indicates chronic obstructive lung disease, chronic interstitial lung disease, or chronic cardiac disease. Chronic diseases of airways (not only chronic obstructive lung disease but also asthma) are characterized by exacerbations and remissions. Patients often have periods when they are severely limited by shortness of breath, but these may be interspersed with periods in which symptoms are minimal or absent. In contrast, many of the diseases of pulmonary parenchyma are characterized by a slow but inexorable progression.

Other Respiratory Symptoms ***Cough*** indicates the presence of lung disease, but cough per se is not useful for the differential diagnosis. The presence of sputum accompanying the cough often suggests airway disease and may be seen in asthma, chronic bronchitis, or bronchiectasis [1,4].

Hemoptysis can originate from disease of the airways, the pulmonary parenchyma, or the vasculature. Diseases of the airways can be inflammatory (acute or chronic bronchitis, bronchiectasis, or cystic fibrosis) or neoplastic (bronchogenic carcinoma or bronchial carcinoid tumors). Parenchymal diseases causing hemoptysis may be either localized (pneumonia, lung abscess, tuberculosis, or infection with *Aspergillus)* or diffuse (Goodpasture's syndrome, idiopathic pulmonary hemosiderosis).

Vascular diseases potentially associated with hemoptysis include pulmonary thromboembolic disease and pulmonary arteriovenous malformations.

Chest pain caused by diseases of the respiratory system usually originates from involvement of the parietal pleura. As a result, the pain is accentuated by respiratory motion and is often referred to as ***pleuritic.*** Common examples include primary pleural disorders, such as neoplasm or inflammatory disorders involving the pleura, or pulmonary parenchymal disorders that extend to the pleural surface, such as pneumonia or pulmonary infarction [6].

Additional Historical Information about risk factors for lung disease should be explicitly explored to assure a complete basis of historical data. A history of current and past smoking, especially of cigarettes, should be sought from all patients. The smoking history should include the number of years of smoking, the intensity (i.e., number of packs per day), and, if the patient no longer smokes, the interval since smoking cessation. The risk of lung cancer falls progressively with the interval following discontinuation of smoking, and loss of lung function above the expected age-related decline ceases with the discontinuation of smoking. Even though chronic obstructive lung disease and neoplasm are the two most important respiratory complications of smoking, other respiratory disorders (e.g., spontaneous pneumothorax, eosinophilic granuloma of the lung, and pulmonary hemorrhage with Goodpasture's syndrome) are also associated with smoking. A history of significant secondhand (passive) exposure to smoke, whether in the home or at the workplace, should also be sought as it may be a risk factor for neoplasm or an exacerbating factor for airways disease.

The patient may have been exposed to other inhaled agents associated with lung disease, which act either via direct toxicity or through immune mechanisms. Such exposures can be either occupational or vocational, indicating the importance of detailed occupational and personal histories, the latter stressing exposures related to hobbies or the home environment. Important agents include the inorganic dusts associated with pneumoconiosis (especially asbestos and silica dusts) and organic antigens associated with hypersensitivity pneumonitis (especially antigens from molds and animal proteins). Asthma often is exacerbated by exposure to environmental allergens (dust mites, pet dander, or cockroach allergens in the home or allergens in the outdoor environment such as pollen and ragweed) or may be caused by occupational exposures (diisocyanates). Exposure to particular infectious agents can be suggested by contacts with individuals with known respiratory infections (especially tuberculosis) or by residence in an area with endemic pathogens (histoplasmosis, coccidioidomycosis, blastomycosis) [6,7].

A history of coexisting non-respiratory disease or of risk factors for or previous treatment of such diseases should be sought, as they may predispose a patient to both infectious and noninfectious respiratory system complications. Common examples

include systemic rheumatic diseases that are associated with pleural or parenchymal lung disease, metastatic neoplastic disease in the lung, or impaired host defense mechanisms and secondary infection, which occurs in the case of hematologic and lymph node malignancies. Risk factors for AIDS should be sought, as the lungs not only are the most common site of AIDS-defining infection but also can be involved by non-infectious complications of AIDS. Treatment of non-respiratory disease can be associated with respiratory complications, either because of effects on host defense mechanisms (immunosuppressive agents, cancer chemotherapy) with resulting infection, or because of direct effects on the pulmonary parenchyma (cancer chemotherapy, radiation therapy, or treatment with other agents, such as amiodarone, that cause interstitial lung disease), or on the airways (beta-blocking agents causing airflow obstruction, angiotensin converting enzyme inhibitors causing cough) [4].

Family history is important for evaluating diseases that have a genetic component. These include disorders such as cystic fibrosis, a-antitrypsin deficiency, and asthma.

Physical examination should be directed not only toward ascertaining abnormalities of the lungs and thorax, but also toward recognizing other findings that may reflect underlying lung disease.

On *inspection*, the rate and pattern of breathing as well as the depth and symmetry of lung expansion are observed. Breathing that is unusually rapid, labored, or associated with the use of accessory muscles of respiration generally indicates either augmented respiratory demands or an increased work of breathing. Asymmetric expansion of the chest is usually due to an asymmetric process affecting the lungs, such as endobronchial obstruction of a large airway, unilateral parenchymal or pleural disease, or unilateral phrenic nerve paralysis. Visible abnormalities of the thoracic cage include kyphoscoliosis and ankylosing spondylitis, each of which can alter compliance of the thorax, increase the work of breathing, and cause dyspnea.

On *palpation,* the symmetry of lung expansion can be assessed, generally confirming the findings observed by inspection. Vibration produced by spoken sounds is transmitted to the chest wall and is assessed by the presence or absence and symmetry of tactile fremitus. Transmission of vibration is decreased or absent if pleural liquid is interposed between the lung and the chest wall, or if an endobronchial obstruction alters sound transmission. In contrast, transmitted vibration may increase over an area of underlying pulmonary consolidation.

The relative resonance or dullness of the tissue underlying the chest wall is assessed by *percussion.* The normal sound of underlying air-containing lung is resonant. In contrast, consolidated lung or a pleural effusion sounds dull, while air in the pleural space sounds hyperresonant [7].

On *auscultation* of the lungs, the examiner listens for both the quality and intensity of the breath sounds and for the presence of extra, or adventitious, sounds. Normal breath sounds heard through the stethoscope at the periphery of the lung are described as *vesicular breath sounds,* in which inspiration is louder and longer than expiration. If sound transmission is impaired by endobronchial obstruction or by air or liquid in the pleural space, breath sounds are weaker or absent. When sound transmission is improved through consolidated lung, the resulting *bronchial breath sounds* have a more tubular quality and a more pronounced expiratory phase. Sound transmission can also be assessed by listening to spoken or whispered sounds; when these are transmitted through consolidated lung, *bronchophony* and *whispered pectoriloquy,* respectively, are present. The sound of a spoken E becomes more like an A, though with a nasal or bleating quality, a finding that is termed *egophony.*

The primary adventitious (abnormal) sounds that can be heard include crackles (rales), wheezes, and rhonchi. *Crackles* represent the sound created when alveoli and small airways open or close during respiration, and often they are associated with interstitial lung disease, microatelectasis, or filling of alveoli by liquid. *Wheezes,* which are generally more prominent during expiration than inspiration, reflect the oscillation of airway walls that occurs when there is airflow limitation, as may be produced by bronchospasm, airway edema or collapse, or intraluminal obstruction by neoplasm or secretions. *Rhonchi* is the term applied to the sounds created when there is free liquid in the airway lumen; the viscous interaction between the free liquid and the moving air creates a low-pitched vibratory sound. Other adventitious sounds include pleural friction rubs and stridor. The gritty sound of a pleural friction rub indicates inflamed pleural surfaces rubbing against each other, often during both inspiratory and expiratory phases of the respiratory cycle. Stridor, which occurs primarily during inspiration, represents flow through a narrowed upper airway, as occurs in an infant with croup.

A meticulous *general physical examination* is mandatory in patients with disorders of the respiratory system. Enlarged lymph nodes in the cervical and supraclavicular regions should be sought. Disturbances of mentation or even coma occur in patients with acute carbon dioxide retention and hypoxemia. Telltale stains on the fingers point to heavy cigarette smoking; infected teeth and gums may occur in patients with aspiration pneumonitis and lung abscess [1].

Clubbing of the digits can be found in lung cancer, interstitial lung disease, and chronic infections in the thorax, such as bronchiectasis, lung abscess, and empyema. Clubbing can also be seen with congenital heart disease associated with right-to-left shunting and with a variety of chronic inflammatory or infectious diseases, such as inflammatory bowel disease and endocarditis. A number of systemic diseases, such as systemic lupus erythematosus, scleroderma, and rheumatoid arthritis, may be associated with pulmonary complications, even though their primary clinical manifestations and

physical findings are not primarily related to the lungs. Conversely, other diseases that most affect the respiratory system, such as sarcoidosis, can have findings on physical examination not related to the respiratory system, including ocular findings (uveitis, conjunctival granulomas) and skin findings (erythema nodosum, cutaneous granulomas).

Chest radiography is often the initial diagnostic study performed to evaluate patients with respiratory symptoms, but it can also provide the initial evidence of disease in patients who are free of symptoms. Perhaps the most common example of the latter situation is the finding of one or more nodules or masses when the radiograph is performed for a reason other than evaluation of respiratory symptoms.

A number of diagnostic possibilities are often suggested by the radiographic pattern. A localized region of opacification involving the air spaces is usually characterized as having an alveolar, an interstitial, or a nodular pattern. In contrast, increased radiolucency can be localized, as seen with a cyst or bulla, or generalized, as occurs with emphysema. The chest radiograph is also particularly useful for the detection of pleural disease, especially if manifested by the presence of air or liquid in the pleural space. An abnormal appearance of the hila and/or the mediastinum can suggest a mass or enlargement of lymph nodes [2].

Additional Diagnostic Evaluation. Further information for clarification of radiographic abnormalities is frequently obtained with computed tomographic scanning of the chest. This technique is more sensitive than plain radiography in detecting subtle abnormalities, can suggest the presence of certain diseases based on the pattern of abnormality, and is very useful as a means of gathering quantitative information about specific radiographic findings.

Pulmonary function tests: quantitation of forced expiratory flow assesses the presence of obstructive physiology, which is consistent with diseases affecting the structure or function of the airways, such as asthma and chronic obstructive lung disease. Measurement of lung volumes assesses the presence of restrictive disorders, seen with diseases of the pulmonary parenchyma or respiratory pump and with space-occupying processes of the pleura.

Bronchoscopy is useful in some settings for visualizing abnormalities of the airways and for obtaining a variety of samples from either the airway or the pulmonary parenchyma [5].

Integration of the presenting clinical pattern and diagnostic studies. Patients with respiratory symptoms but a normal chest radiograph most commonly have diseases affecting the airways, such as asthma or chronic obstructive pulmonary disease. However, the latter diagnosis is also commonly associated with radiographic abnormalities, such as diaphragmatic flattening and attenuation of vascular markings. Other disorders of the respiratory system for which the chest radiograph is normal

include disorders of the respiratory pump (either the chest wall or the neuromuscular apparatus controlling the chest wall) and occasionally interstitial lung disease. Chest examination and pulmonary function tests are generally helpful in sorting out these diagnostic possibilities. Obstructive diseases associated with a normal or relatively normal chest radiograph are often characterized by findings on physical examination and pulmonary function testing that are typical for these conditions. Similarly, diseases of the respiratory pump or interstitial diseases may also be suggested by findings on physical examination or by particular patterns of restrictive disease seen on pulmonary function testing.

When respiratory symptoms are accompanied by radiographic abnormalities, diseases of the pulmonary parenchyma or the pleura are usually present. Either diffuse or localized parenchymal lung disease is generally visualized well on the radiograph, and both air and liquid in the pleural space (pneumothorax and pleural effusion, respectively) are usually readily detected by radiography [1-4].

Radiographic findings in the absence of respiratory symptoms often indicate localized disease affecting the airways or the pulmonary parenchyma. One or more nodules or masses can suggest intrathoracic malignancy, but they also can be the manifestation of a current or previous infectious process. Patients with diffuse parenchymal lung disease present on radiographic examination may be free of symptoms, as is sometimes the case with pulmonary sarcoidosis.

Chronic obstructive pulmonary disease (COPD) is estimated to affect 32 million persons in the U.S. and is the fourth leading cause of death in this country. Patients typically have symptoms of chronic bronchitis and emphysema, but the classic triad also includes asthma. Can you identify COPD when you see it and take the necessary steps to help patients keep breathing?

The primary cause of COPD is exposure to tobacco smoke. Overall, tobacco smoking accounts for as much as 90% of COPD risk. However, COPD does occur in individuals who have never smoked. Environmental factors (eg, pollution), alpha1-antitrypsin deficiency, intravenous drug use, immunodeficiency syndromes (eg, HIV), and vasculitis syndromes have also been linked to COPD. In addition, connective tissue disorders such as Marfan syndrome have been associated.

Marfan syndrome is an autosomal dominant inherited disease of type I collagen, characterized by abnormal length of the extremities, subluxation of the lenses, and cardiovascular abnormality. Pulmonary abnormalities, including emphysema, have been described in approximately 10% of patients [1,2].

The exact prevalence of COPD in the U.S. is difficult to estimate because it is underdiagnosed and undertreated. Most patients do not present for medical care until the disease is in a late stage.

COPD predominantly occurs in individuals older than 40 years. Although current rates of COPD are higher in men than in women, rates in women have been increasing. Moreover, severe, early-onset disease probably represents a distinct genotype and is more common in females. Those with a family history of COPD, as well as black persons, are also at increased risk for this specific type [2,4].

The value of patient history and physical examination was addressed in the 2013 update to the American College of Physicians/American College of Chest Physicians/American Thoracic Society/European Respiratory Society (ACP/ACCP/ATS/ERS) guideline for diagnosis and management of stable COPD. According to the current guideline, a history of more than 40 pack-years of smoking was the best single predictor of airflow obstruction; however, the most helpful information was provided by a combination of the following three signs:

- Self-reported smoking history of more than 55 pack-years;
- Wheezingonauscultation; and
- Self-reportedwheezing.

Signs and symptoms

Patients typically present with a combination of signs and symptoms of chronic bronchitis, emphysema, and reactive airway disease. Symptoms include the following:

- Cough, usually worse in the mornings and productive of a small amount of colorless sputum.
- Acute chest illness.
- Breathlessness: The most significant symptom, but usually does not occur until the sixth decade of life
- Wheezing: May occur in some patients, particularly during exertion and exacerbations

The sensitivity of physical examination in detecting mild to moderate COPD is relatively poor, but physical signs are quite specific and sensitive for severe disease. Findings in severe disease include the following:

- Tachypnea and respiratory distress with simple activities
- Use of accessory respiratory muscles and paradoxical indrawing of lower intercostal spaces (Hoover sign)
- Cyanosis
- Elevated jugular venous pulse (JVP)
- Peripheral edema

Thoracic examination reveals the following:

- Hyperinflation (barrel chest)
- Wheezing – Frequently heard on forced and unforced expiration
- Diffusely decreased breath sounds
- Hyperresonance on percussion

- Prolonged expiration
- Coarse crackles beginning with inspiration in some cases

Certain characteristics allow differentiation between disease that is predominantly chronic bronchitis and that which is predominantly emphysema. Chronic bronchitis characteristics include the following:

- Patients may be obese
- Frequent cough and expectoration are typical
- Use of accessory muscles of respiration is common
- Coarse rhonchi and wheezing may be heard on auscultation
- Patients may have signs of right heart failure (ie, corpulmonale), such as edema and cyanosis

Emphysema characteristics include the following:

- Patients may be very thin with a barrel chest
- Patients typically have little or no cough or expectoration
- Breathing may be assisted by pursed lips and use of accessory respiratory muscles; patients may adopt the tripod sitting position
- The chest may be hyperresonant, and wheezing may be heard
- Heart sounds are very distant
- Overall appearance is more like classic COPD exacerbation [7].

Diagnosis. The formal diagnosis of COPD is made with spirometry; when the ratio of forced expiratory volume in 1 second over forced vital capacity (FEV_1/FVC) is less than 70% of that predicted for a matched control, it is diagnostic for a significant obstructive defect. Criteria for assessing the severity of airflow obstruction (based on the percent predicted postbronchodilator FEV_1) are as follows:

- Stage I (mild): FEV_1 80% or greater of predicted
- Stage II (moderate): FEV_1 50-79% of predicted
- Stage III (severe): FEV_1 30-49% of predicted
- Stage IV (very severe): FEV_1 less than 30% of predicted or FEV_1 less than 50% and chronic respiratory failure

Arterial blood gas (ABG) findings are as follows:

- ABGs provide the best clues as to acuteness and severity of disease exacerbation
- Patients with mild COPD have mild to moderate hypoxemia without hypercapnia
- As the disease progresses, hypoxemia worsens and hypercapnia may develop, with the latter commonly being observed as the FEV_1 falls below 1 L/s or 30% of the predicted value

- pH usually is near normal; a pH below 7.3 generally indicates acute respiratory compromise
- Chronic respiratory acidosis leads to compensatory metabolic alkalosis

In patients with emphysema, frontal and lateral chest radiographs reveal the following:

- Flattening of the diaphragm
- Increased retrosternal air space
- A long, narrow heart shadow
- Rapidly tapering vascular shadows accompanied by hyperlucency of the lungs
- Radiographs in patients with chronic bronchitis show increased bronchovascular markings and cardiomegaly

Advantages of high-resolution CT include the following:

- Greater sensitivity than standard chest radiography
- High specificity for diagnosing emphysema (outlined bullae are not always visible on a radiograph)
- May provide an adjunctive means of diagnosing various forms of COPD (eg, lower lobe disease may suggest alpha1-antitrypsin (AAT) deficiency
- May help the clinician determine whether surgical intervention would benefit the patient

Other tests are as follows:

- Hematocrit – Patients with polycythemia (hematocrit greater than 52% in men or 47% in women) should be evaluated for hypoxemia at rest, with exertion, or during sleep
- Serum potassium – Diuretics, beta-adrenergic agonists, and theophylline act to lower potassium levels
- Measure AAT in all patients younger than 40 years or in those with a family history of emphysema at an early age
- Sputum evaluation will show a transformation from mucoid in stable chronic bronchitis to purulent in acute exacerbations
- Pulse oximetry, combined with clinical observation, provides instant feedback on a patient's status
- Electrocardiography can help establish that hypoxia is not resulting in cardiac ischemia and that the underlying cause of respiratory difficulty is not cardiac in nature
- The distance walked in 6 minutes (6MWD) is a good predictor of all-cause and respiratory mortality in patients with moderate COPD[2, 3] ; patients with COPD who

desaturate during the 6MWD have a higher mortality rate than do those who do not desaturate

- Two-dimensional echocardiography can screen for pulmonary hypertension
- Right-sided heart catheterization can confirm pulmonary artery hypertension and gauge the response to vasodilators

If all three signs are absent, airflow obstruction can be nearly ruled out. COPD is now known to be a disease with systemic manifestations, and the quantification of these manifestations has proved to be a better predictor of mortality than lung function alone. Many patients with COPD may have decreased fat-free mass, impaired systemic muscle function, osteoporosis, anemia, pulmonary hypertension, corpulmonale, and even left-sided heart failure. Depression is not uncommon in persons with COPD [1,7].

Management. Smoking cessation continues to be the most important therapeutic intervention for COPD. Risk factor reduction (eg, influenza vaccine) is appropriate for all stages of COPD. Approaches to management by stage include the following**:**

- Stage I (mild obstruction): Short-acting bronchodilator as needed
- Stage II (moderate obstruction): Short-acting bronchodilator as needed; long-acting bronchodilator(s); cardiopulmonary rehabilitation
- Stage III (severe obstruction): Short-acting bronchodilator as needed; long-acting bronchodilator(s); cardiopulmonary rehabilitation; inhaled glucocorticoids if repeated exacerbations
- Stage IV (very severe obstruction or moderate obstruction with evidence of chronic respiratory failure): Short-acting bronchodilator as needed; long-acting bronchodilator(s); cardiopulmonary rehabilitation; inhaled glucocorticoids if repeated exacerbation; long-term oxygen therapy (if criteria met); consider surgical options such as lung volume reduction surgery (LVRS) and lung transplantation [1,5].

Agents used include the following:

- Short-acting $beta_2$ -agonist bronchodilators (eg, albuterol, metaproterenol, levalbuterol, pirbuterol)
- Long-acting $beta_2$ -agonist bronchodilators (eg, salmeterol, formoterol, arformoterol, indacaterol, vilanterol)
- Respiratory anticholinergics (eg, ipratropium, tiotropium, aclidinium)
- Xanthine derivatives (ie, theophylline)
- Phosphodiesterase-4 Inhibitors (ie, roflumilast)
- Inhaled corticosteroids (eg, fluticasone, budesonide)
- Oral corticosteroids (eg, prednisone)
- $Beta_2$ -agonist and anticholinergic combinations (eg, ipratropium and albuterol, umeclidinium bromide/vilanterol inhaled)

- $Beta_2$ -agonist and corticosteroid combinations (eg, budesonide/formoterol, fluticasone and salmeterol, vilanterol/fluticasone inhaled)

Pulmonary rehabilitation programs are typically multidisciplinary approaches that emphasize the following:

- Patient and family education
- Smoking cessation
- Medical management (including oxygen and immunization)
- Respiratory and chest physiotherapy
- Physical therapy with bronchopulmonary hygiene, exercise, and vocational rehabilitation
- Psychosocial support

Indications for admission for acute exacerbations include the following:

- Failure of outpatient treatment
- Marked increase in dyspnea
- Altered mental status
- Increase in hypoxemia or hypercapnia
- Inability to tolerate oral medications such as antibiotics or steroids

Oral and inhaled medications are used for patients with stable disease to reduce dyspnea and improve exercise tolerance. Most of the medications used are directed at the following four potentially reversible causes of airflow limitation in a disease state that has largely fixed obstruction:

- Bronchialsmoothmusclecontraction;
- Bronchial mucosal congestion and edema;
- Airwayinflammation; and
- Increasedairwaysecretions.
- COPD is commonly associated with progressive hypoxemia. Oxygen administration reduces mortality rates in patients with advanced COPD because of the favorable effects on pulmonary hemodynamics. Long-term oxygen therapy improves survival twofold or more in hypoxemic patients with COPD. Hypoxemia is defined as PaO2 (partial pressure of oxygen in arterial blood) of < 55 mm Hg or oxygen saturation of < 90%. Oxygen was used for 15-19 hours per day. Therefore, specialists recommend long-term oxygen therapy for patients with a PaO2 of < 55 mm Hg, a PaO2 of < 59 mm Hg with evidence of polycythemia, or corpulmonale. Reevaluate these patients one to three months after initiating therapy, because some patients may not require long-term oxygen [1,5].

The use of systemic steroids in the treatment of acute exacerbations is widely accepted and recommended, given their high efficacy. A meta-analysis concluded that oral and parenteral corticosteroids significantly reduced treatment failure and the need for additional medical treatment, and that they increased the rate of improvement in lung function and dyspnea over the first 72 hours. Note that systemic steroids are not as effective in treating COPD exacerbations as they are in treating bronchial asthma exacerbations.

On the other hand, the use of oral steroids in persons with chronic stable COPD is widely discouraged, given their adverse effects, which include hypertension, glucose intolerance, osteoporosis, fractures, and cataracts. A Cochrane review showed no benefit at low-dose therapy and short-lived benefit with higher doses (> 30 mg of prednisolone). [3,5].

Inhaled corticosteroids provide a more direct route of administration to the airways, and similar to other inhaled agents, they are only minimally absorbed. Consequently, aside from the development of thrush, the systemic adverse effects of these medications at standard doses are negligible. Despite the theoretical benefit, the current consensus is that inhaled corticosteroids do not decrease the decline in FEV_1, although they have been shown to decrease the frequency of exacerbations and improve quality of life for symptomatic patients with an FEV_1 of < 50%. The current ICSI guidelines conclude that inhaled steroids are appropriate in patients with recurrent exacerbations of COPD.

Disorders of the kidney and urinary tract

Approach to the patient with diseases of the kidneys and urinary tract

Diseases of the kidneys and urinary tract frequently give rise to consistent arrays or clusters of clinical signs, symptoms, and laboratory findings called *syndromes.* Syndromes are useful diagnostically because each has fewer causes than the individual clinical signs and symptoms it contains. For example, any injured capillary bed from glomerulus to urethral meatus can cause hematuria, but only glomerular injury also can cause heavy albuminuria and erythrocyte casts, and only a few of the diseases that injure the glomerular capillaries enough to cause hematuria and proteinuria also cause a rapid fall in glomerular filtration rate. Routine clinical evaluation is often sufficient to suggest that a particular syndrome may be present (Table 1), but additional laboratory measurements beyond the routine, as well as radiologic and/or urologic evaluation and sequential clinical observations, are usually required to establish the diagnosis. [4,5].

Acute and rapidly progressive renal failure. Whether the glomerular filtration rate (GFR) falls over days (acute renal failure - ARF) or weeks (rapidly progressive renal failure - RPRF) is a useful distinction, because the causes of these two syndromes are somewhat different (Table 1). For example, acute tubular necrosis, from sepsis,

nephrotoxic materials, shock, or other cause, is the usual cause of ARF, whereas extracapillary proliferative (crescentic) glomerulonephritis, due to immunologic injury or to vasculitis, is an important cause of RPRF but not ARF.

Proof for the existence of either syndrome requires serial determination of the GFR, blood urea nitrogen, or serum creatinine level. Anuria or oliguria strongly suggests ARF, since life cannot be sustained for long with such inadequate renal function. Symptoms and signs of uremia of recent onset suggest RPRF or ARF but also could result from chronic renal failure (CRF) that has only recently become life-threatening. Although edema, hypertension, and abnormalities of electrolytes and the urine sediment (Table 1) are frequent in both ARF and RPRF, they occur in other syndromes as well and are not specific [7].

Urinary obstruction, acute tubular necrosis, some forms of vasculitis, major renal vascular accidents, and endogenous and exogenous nephrotoxins are common causes of ARF. Vasculitis and crescentic glomerulonephritis are common causes of RPRF. Hemolytic-uremic syndrome, malignant nephrosclerosis, and essential mixed cryoimmunoglobulinemia occasionally present as RPRF. Idiopathic rapidly progressive glomerulonephritis - the prototype of a disease that produces RPRF - sometimes causes ARF. CRF may occur in some patients with diseases that typically cause ARF. Nevertheless, despite some variability of disease presentations, the finding of ARF or RPRF narrows the range of causes [4].

Acute nephritis. A number of diseases involve the glomeruli and, to a generally lesser extent, the tubules in an acute but transient inflammatory process, manifested clinically by acute reduction in GFR and salt and water retention. This process is called *glomerulonephritis*. Expansion of the extracellular volume, if marked, causes hypertension, pulmonary vascular congestion, and facial and peripheral edema. Since the causes of this syndrome all can damage the glomerular wall enough to permit red blood cells and plasma proteins to enter the urinary space and appear in the urine, gross or microscopic hematuria, red blood cell casts, and proteinuria are necessary for the diagnosis of acute glomerulonephritis, and their absence suggests other diagnoses. Acute glomerulonephritis is a transient inflammatory process, so it’s clinical and laboratory manifestations wax and wane over days to weeks. Many of the diseases that cause acute glomerulonephritis also cause ARF or RPRF. When acute glomerulonephritis is associated with RPRF, the term *rapidly progressive glomerulonephritis* is often applied as a clinical diagnosis, pending biopsy delineation of the precise disease process. Other diseases cause an acute but transitory inflammation of the tubules and interstitium (acute tubulointerstitial nephritis) but not of the glomerular capillaries. Hematuria, red blood cell casts, and reduction of GFR occur, as in acute glomerulonephritis, but proteinuria is less marked and, when present, consists mainly of low-molecular-weight proteins rather than albumin. Apart from the lesser

proteinuria, tubulointerstitial nephritis may be manifested by increased urine leukocytes and especially urine eosinophils, as well as by peripheral blood eosinophilia [1].

Acute glomerulonephritis following infection with group A streptococci is the prototype of a disease that causes acute nephritis alone. Immune complexes deposit in the subepithelial region of the glomerular capillary wall, between the basement membrane and the visceral epithelial cells that separate the membrane from the urinary space, and provoke an intense but transient inflammatory process. GFR falls but returns to normal within weeks to months in most patients. Deposition of immune complexes is also believed to be the cause of acute nephritis following other bacterial and viral infections and of lupus nephritis, membranoproliferative glomerulonephritis, Henoch-Schonlein purpura, and Berger's disease, i.e., IgA nephropathy. That the typical presentations of the last four diseases are chronic renal failure, nephrotic syndrome, and asymptomatic urinary abnormalities illustrates the weakness of relationships between pathogenesis and final clinical manifestations.

Renal biopsy is usually required for the evaluation of patients with acute nephritis, whether or not ARF or RPRF is also present. In patients with RPRF and glomerulonephritis (rapidly progressive glomerulonephritis), the usual histologic picture is that of proliferative glomerulonephritis, often with extracapillary crescent formation. However, this picture may also occur in patients without RPRF, and many other forms of histologic abnormality may be found in patients with acute glomerulonephritis. Thus, prediction of histopathology from clinical course is very uncertain. Prognosis and treatment are influenced strongly by the precise histologic and ultrastructural pattern, as well as the types of immune complexes and immunoglobulins deposited in the renal tissues. In patients with acute tubulointerstitial nephritis, inflammatory changes are prominent in the renal interstitium and evidence of tubule cell injury may be present, but glomerular abnormalities are often absent altogether [7].

Chronic renal failure. CRF results from progressive and irreversible destruction of nephrons, regardless of cause. This diagnosis implies that the GFR is known to have been reduced for at least 3 to 6 months. Often a gradual decline in GFR occurs over a period of years. Proof of chronicity is also provided by the demonstration of bilateral reduction of kidney size by scout film, ultrasonography, intravenous pyelography, or tomography. Other findings of long-standing renal failure, such as renal osteodystrophy or symptoms of uremia, also help to establish this syndrome. Several laboratory abnormalities are often regarded as reliable indicators of chronicity of renal disease, such as anemia, hyperphosphatemia, or hypocalcemia, but these are not specific.

In contrast, the finding of broad casts in the urinary sediment is specific for CRF, the wide diameters of these casts reflecting the compensatory dilatation and hypertrophy of surviving nephrons. Proteinuria is a frequent but nonspecific finding, as is hematuria. Chronic obstructive uropathy, polycystic and medullary cystic diseases, analgesic

nephropathy, and the inactive end stage of any chronic tubulointerstitial nephropathy are conditions in which the urine often contains little or no protein, cells, or casts even though nephron destruction has progressed to chronic renal failure.

When ARF occurs in the presence of CRF, the acute component must be evaluated as if CRF were not present, because the acute component is potentially reversible. The depletion of extracellular fluid volume is the cause of acute deterioration of renal function, but urinary tract obstruction, drug-induced nephrotoxicity, or exacerbation of underlying renal disease also may be responsible [7].

Nephrotic syndrome. This diagnosis previously implied that a patient excretes more than 3.5 g protein per 1.73 m^2 surface area per 24 h; the proteinuria consists mainly of albumin; and that the patient has reduced serum albumin, edema, and hyperlipidemia. Massive proteinuria alone has now come to define the syndrome, since this finding connotes serious renal disease whether or not the protein losses lead to hypoalbuminemia, lipid disturbances, or edema. Provided the proteins in the urine are not paraproteins readily excreted by the normal kidney (e.g., immunoglobulin light chains in multiple myeloma), massive proteinuria is invariably a sign of injury to the glomeruli.

Table 1

Initial Clinical and Laboratory Data Base for Defining Major Syndromes in Nephrology

Syndromes	Important Clues to Diagnosis	Findings that are Common
Acute or rapidly progressive renal failure	Anuria Oliguria Documented recent decline in GFR	Hypertension, hematuria Proteinuria, pyuria
Acute nephritis	Hematuria, RBC casts Azotemia, oliguria Edema, hypertension	Casts, edema Proteinuria Pyuria Circulatory congestion
Chronic renal failure	Azotemia for >3 months Prolonged symptoms or signs of uremia Symptoms or signs of renal osteodystrophy Kidneys reduced in size bilaterally Broad casts in urinary sediment	Hematuria, proteinuria Casts, oliguria Polyuria, nocturia Edema, hypertension Electrolyte disorders
Nephrotic syndrome	Proteinuria >3.5 g per 1.73 m^2 per 24 h Hypoalbuminemia Hyperlipidemia Lipiduria	Casts Edema
Asymptomatic urinary abnormal ities	Hematuria Proteinuria (below nephrotic range) Sterile pyuria, casts	

Syndromes	Important Clues to Diagnosis	Findings that are Common
Urinary tract infection	Bacteriuria $>10^5$ colonies per milliliter Other infectious agent documented in urine Pyuria, leukocyte casts Frequency, urgency Bladder tenderness, flank tenderness	Hematuria Mild azotemia Mild proteinuria Fever
Renal tubule defects	Electrolyte disorders Polyuria, nocturia Symptoms or signs of renal osteodystrophy Large kidneys Renal transport defects	Hematuria "Tubular" proteinuria Enuresis
Hypertension	Systolic/diastolic hypertension	Proteinuria Casts Azotemia
Nephrolithiasis	Previous history of stone passage or removal Previous history of stone seen by x-ray Renal colic	Hematuria Pyuria Frequency, urgency
Urinary tract obstruction	Azotemia, oliguria, anuria Polyuria, nocturia, urinary retention Slowing of urinary stream Large prostate, large kidneys Flank tenderness, full bladder after voiding	Hematuria Pyuria Enuresis, dysuria

Common causes of the nephrotic syndrome include minimal change disease, idiopathic membranous glomerulopathy, focal and segmental glomerulosclerosis, and diabetic glomerulosclerosis. Because these diseases typically cause less inflammation than those that cause acute nephritis, the urine usually contains fewer cellular elements, and acute changes in GFR and urine volume are uncommon. Hematuria may occur in some forms of nephrotic syndrome, however, especially chronic membranoproliferative glomerulonephritis. The presence of cellular or granular casts should suggest lupus nephritis or acute nephritis associated with massive proteinuria, such as essential mixed cryoimmunoglobulinemia, acute bacterial endocarditis, visceral sepsis, and Henoch-Schonlein purpura [7].

Asymptomatic urinary abnormalities. Mild microscopic hematuria, pyuria, and casts or less than 3.5 g protein per 1.73 m^2 surface area per 24 h may be present in the urine of a patient with no evidence of other nephrologic syndromes. By exclusion, these patients belong to the syndrome of asymptomatic urinary abnormalities. Isolated hematuria or proteinuria, or unexplained pyuria, are the most frequent abnormalities in this syndrome.

Isolated hematuria, without proteinuria or casts, may be the sole clue to the presence of neoplasm, stone, or infection (e.g., tuberculosis) in any part of the urinary tract. Isolated hematuria also may arise from renal papillae in analgesic and sickle cell nephropathies. Persistent isolated hematuria often requires intravenous pyelography, cystoscopy, and, occasionally, renal arteriography to identify the source of bleeding. *NephromaI hematuria,* in which casts contain red blood cells or hemoglobin pigment, indicates damage to the nephron. It occurs without proteinuria, mainly in benign recurrent hematuria and Berger's disease. *Nephronal hematuria and proteinuria* occur together in many renal diseases that may lead to chronic renal failure. In general, the combination of nephronal hematuria and proteinuria suggests a worse prognosis than either alone.

***Isolated proteinuria,* without red blood cells or other formed elements in the urinary sediment, is** characteristic of many renal diseases that manifest little or no inflammatory reaction within the glomeruli (e.g., diabetes mellitus, amyloidosis). Less than nephrotic-range proteinuria is common in mild forms of all the diseases that can cause overt nephrotic syndrome. "Tubular" proteinuria is the rule in cystinosis; in intoxication from cadmium, lead, or mercury; and in the peculiar Balkan nephropathy localized to a small region along the Danube River [1-4].

Pyuria (leukocyturia) also may be a sole urinary abnormality and may reflect infection or inflammation of the lower urinary tract rather than parenchymal renal disease. Prominent pyuria can occur in any inflammatory disease of the kidneys, especially tubuloin- terstitial nephritis, lupus nephritis, pyelonephritis, and renal transplant rejection, but usually in association with mild proteinuria or hematuria. The finding of leukocyte casts establishes the kidney as the site of the inflammatory reaction.

Pyuria associated with urine that is sterile on routine bacteriologic culture presents a special problem. Causes of "sterile pyuria" include: 1) recent bacterial urinary infection being treated with antibiotics, 2) glucocorticoid therapy, 3) acute febrile episodes, 4) cyclophosphamide administration, 5) pregnancy, 6) renal transplant rejection, 7) genitourinary trauma, 8) prostatitis and cystourethritis, and 9) all forms of tubulointerstitial nephritis. Leukocytes from vaginal secretions may contaminate the urine, so a midstream, clean-catch urine sample should be collected to substantiate a urinary origin. Pyuria associated with proteinuria, nephronal hematuria, or casts usually signifies inflammatory disease of the renal glomeruli, tubules, interstitium, or microcirculation, and evaluation should focus not on the pyuria but on the nature of the renal disease [2].

Persistent sterile pyuria that cannot be ascribed to any of the foregoing causes has a narrow differential diagnosis. Unusual infections, such as tuberculosis, fungi, atypical mycobacteria, *Haemophilus influenzae,* anaerobic bacteria, fastidious bacteria that grow

only on enriched media, and L-forms, all must be sought. Intravenous pyelography may be needed to detect causes such as urinary tract calculi, papillary necrosis, and renal infiltration by lymphoma or myeloma cells. The latter is usually suspected because of other evidence of myeloma or lymphoma, for both rarely involve only the kidneys. If all tests are negative, cystoscopy may reveal cystitis or trigone inflammation [18].

Urinary tract infection. This syndrome is defined by the demonstration in urine of pathogenic organisms, bacteria, tubercle bacilli, or fungi. When urine is obtained for culture, the condition under which the urine is collected must minimize contamination from external surfaces. Women should void into a wide-mouthed sterile container after preliminary cleansing of the vulva with a moist, sterile gauze pledged. In men, midstream collection is usually adequate. Bacterial colony counts of 10^5 organisms per milliliter or greater in urine generally indicate urinary tract colonization and infection. Levels above 10^2 colonies per milliliter are sufficient to indicate infection in symptomatic patients and in urine samples obtained by suprapubic aspiration or bladder catheter. When the urinary tract is anatomically normal, *Escherichia coli* is the usual pathogen. After prolonged antibiotic treatment of persistent infections, particularly when urinary drainage is impaired or stones are present, *Klebsiella, Enterobacter*, and *Proteus* species predominate [1].

A positive urine culture need not imply that an organism is producing tissue inflammation or injury. In some patients, tissue effects may be trivial; in others, injury may occur even though symptoms or urinary abnormalities are not present at the time of evaluation. When bacteriuria is associated with tissue inflammation or injury, clinical manifestations usually depend on the site(s) involved. Dysuria, frequency, urgency, and suprapubic tenderness are common symptoms of bladder and urethral inflammation. Prostatitis also leads to frequency, dysuria, and urgency, and the prostate may be boggy and tender on rectal examination. Flank pain, chills, fever, nausea and vomiting, hypotension from sepsis, and leukocyte casts all suggest true renal parenchymal infection, i.e., pyelonephritis; their absence, however, does riot exclude pyelonephritis.

Renal tubule defects. This syndrome encompasses a large number of acquired and hereditary disorders, all of which tend to affect tubules more than glomeruli. Hereditary anatomic defects, including polycystic renal disease, medullary cystic disease, and medullary sponge kidney, are readily detected by ultrasonography or intravenous pyelography, which are usually performed because of hematuria, bacteriuria, flank pain, or unexplained azotemia.

Defects in tubule transport functions, on the other hand, tend not to be associated with prominent renal anatomic defects and arise either as inherited traits or during the course of acquired renal disease. In general, these functional defects impair secretion and/or reabsorption of electrolytes and organic solute» or limit urinary concentrating and diluting ability. Typical manifestations of such functional disturbances include

polyuria and nocturia, metabolic acidosis, and various disorders of fluid and electrolyte balance. Such defects are defined by direct physiologic measurements; their elucidation requires a sound understanding of normal renal physiology.

Hypertension implies that the average of a series of reliable blood pressure measurements exceeds 140 mmHg systolic or 90 mmHg diastoli. The pathogenetic mechanisms, clinical and laboratory manifestations, and therapeutic approaches are discussed in detail elsewhere.

N**ephrolithiasis.** This syndrome is recognized with certainty when a stone is passed, visualized by x-ray, or removed at surgery or cystoscopy. Less certain, but suggestive, evidences of nephrolithiasis include renal colic; painful hematuria; or unexplained pyuria, dysuria, and urinary frequency. Colic varies in its symptomatology but usually begins suddenly in one flank, radiates downward toward the groin, and is excruciatingly painful.

Most renal stones are composed of calcium, uric acid, cystine, or struvite (magnesium ammonium phosphate). All are radiopaque except for uric acid stones and are therefore visible by routine abdominal radiography. Uric acid stones appear as radiolucent filling defects and can be mistaken for tumor or blood clot.

Urinary tract obstruction. Documentation of the various structural or functional causes of urinary tract obstruction usually requires radiologic or surgical visualization. The most common initial evaluation at present is renal ultrasonography, although false-negative evaluations are not rare, especially when urine flow rate is low. The manifestations of obstruction, which initiate the search for its causes, are numerous. Anuria in an adult is almost always due to obstruction of bladder outflow. Less commonly, blockage of upper urinary drainage from both kidneys or from a solitary functioning kidney accounts for total or near-total cessation of urine flow. A large bladder after voiding is a sign of outflow obstruction, usually due to urethral stricture, tumor, stone, neurogenic causes, or prostatic hypertrophy. Nocturia, frequency and overflow incontinence, and slowing or hesitancy of micturition also suggest outflow obstruction. Upper tract obstruction often produces few manifestations. When it is incomplete or unilateral, urine volume may be normal or even increased because of a loss of renal concentrating ability. Urinary stasis secondary to obstruction predisposes to recurrent urinary tract infection; chronic obstruction predisposes to progressive loss of renal function [7,19].

Disorders of the gastrointestinal system

Approach to the patient with gastrointestinal disease

Biologic considerations. The mucosal surface of the gastrointestinal (GI) tract is composed of a remarkably dynamic population of epithelial cells that are highly developed in their capacity for transmembrane absorption and secretion. These

secretory and absorptive abilities facilitate the essential function of the digestive tract in digestion and nutrient uptake, which must be accomplished while maintaining the barrier between the host and potentially harmful pathogens and mutagens in the lumen. The latter is accomplished through both the physical integrity of the intact mucosal surface and the extensive population of resident immune cells [20].

The intestinal surface itself also contains the distinctive M-cells that serve to sample the antigenic milieu of the lumen. They overlie lymphoid aggregates (Peyer's patches). The predominance of suppressor lymphocytes in the surface epithelial layer (intraepithelial lymphocytes) suggests that damping of the body's response to the enormous number of potentially antigenic substances in the lumen is necessary to prevent the constant and unrestrained activation of immune and inflammatory processes. Conversely, the presence of large numbers of helper lymphocytes as well as other cellular effectors of immune response in the lamina propria and submucosa attests to a large armamentarium ready to respond when surface defenses have been breached. No doubt the concentration of so many immune cells capable of attracting and activating inflammatory cells predisposes to the numerous inflammatory conditions to which the GI tract is subject.

The mucosal surface of the GI tract is also remarkable for the very rapid turnover of the epithelial cell population. It is likely that the epithelium turns over in its entirety every 24 to 72 h. This capacity may permit rapid restitution of a functional cell population following an acute insult and may reduce the risk of malignancy through the shedding of cells affected by the many mutagens in the luminal contents. Nevertheless, this proliferative potential creates the setting for neoplastic disorders, which are so common in the GI tract. Another fundamental feature of the GI mucosa is the spatial segregation of the proliferative compartment from the terminally differentiated cells. This is true throughout the GI tract but is most apparent in the small intestine, where a gradient of differentiation exists from the depths of the crypts of Lieberkiihn to the villus tip. This organization has a strong effect on the histology and pathophysiology of many mucosal disorders, such as celiac sprue [7,.20].

In view of the important secretory and absorptive activities of mucosal surface, diseases of the GI tract may result in clinical consequences owing to physical disruption of the mucosal layer (e.g., blood loss, fluid loss, pathogenic invasion) or to nutritional derangements caused by impaired digestion and nutrient absorption. In focal or localized disease processes the former effects predominate, whereas the latter may be especially prominent in disorders that affect extensive areas of the GI tract in a diffuse manner.

While the essential roles of the GI tract - the absorption of nutrients and the excretion of the products - are accomplished in large part at the luminal surface, these processes also depend on the deeper muscular layers for the coordinated propulsion of

food through the lumen. The complexity of the local and distant neural and endocrine factors that contribute to the regulation of intestinal motility is only now becoming fully appreciated. Disruption of normal motility is quite common, with functional bowel complaints affecting as many as 15% of adults. Alterations in frequency of bowel movements, abdominal distention, abdominal pain, and nausea, individually or in varying combinations, may result from dysmotility. In addition, structural lesions may also indirectly lead to symptoms through their impact on motility involving some or all regions of the GI tract. These range from the *direct* effects of an obstructing lesion to the *indirect* actions of substances released by a primary mucosal disorder (e.g., inflammatory mediators such as arachidonic acid metabolites that also affect smooth-muscle activity) [20].

Although valid unifying generalizations can be made about the GI tract in its entirety, the spectrum of diseases affecting this system and their clinical manifestations are significantly related to the constituent organ(s) involved (Table 2). Thus, esophageal disorders manifest themselves mainly through their relationship to swallowing; gastric disorders are dominated by features relating to acid secretion; and disease of the small and large intestine is evidenced mainly by disruption of nutrition and alterations of bowel movements. Similarly, diseases of the related ancillary organs, the exocrine pancreas and the hepatobiliary system, present characteristic clinical challenges. Finally, the GI tract may be affected by systemic disorders. These include vascular, inflammatory, infectious, and neoplastic conditions leading to focal or diffuse structural lesions. Metabolic and endocrine abnormalities as well as some drugs can disrupt normal bowel motility Table 2 summarizes criteria that may be used to distinguish functional from organic or structural diseases of the GI tract.

Clinical considerations. Clinical history is essential in directing the clinician's attention to appropriate diagnostic considerations in the patient with GI symptoms. The most common complaints resulting from disorders involving the GI tract include pain and alterations in bowel habit, especially diarrhea or constipation. Of these complaints, ***abdominal pain*** is the most frequent and variable and may reflect a broad spectrum of problems, from the least threatening to the most urgent. In conjunction with an estimation of its intensity, an initial distinction should be made between pain of acute onset and more chronic discomfort. Pain of abrupt onset is often encountered in serious illness requiring urgent intervention, while a history of chronic discomfort is most often related to an indolent disorder. Dyspepsia, an ill-defined upper abdominal discomfort, is especially common. It is often accompanied in varying degrees by feelings of nausea, bloating, and distention. While it may be associated with peptic ulceration, non-ulcer dyspepsia (NUD) is common. A change in the pattern or character of pain may be equally important, possibly signifying the progression to a more critical stage of a problem (either recent or chronic) that was mild in onset. Ascertaining the location of

the pain (upper or lower, localized or diffuse), its character (sharp, burning, cramping), and its relationship to meals will often provide significant insight into the most important diagnostic considerations. If eating produces the symptom, the clinician should determine whether the discomfort occurs while the patient is eating (as in esophageal disorders), shortly after the meal (as often occurs in biliary tract disease and abdominal angina), or 30 to 90 min later (as is typical of peptic disease). Pain that is not affected by eating suggests a process outside of the bowel lumen, such as abscess, peritonitis, pancreatitis, and some malignancies. Conversely, identification of factors that relieve the symptom is also helpful. For example, eating or antacid use typically gives relief in peptic ulcer disease or gastritis. A relationship of the discomfort to bowel movement, especially in association with an altered bowel habit, should focus attention on a disorder of the small or large bowel, such as inflammatory bowel disease [7].

Alterations in bowel habit can result from either disruption of normal intestinal motility or significant structural pathology. A thorough determination of the temporal evolution of the change and the nature of the alteration, in conjunction with other constitutional symptoms such as weight loss, fever, or anorexia, is important. A temporary variation in bowel habit in association with some life stress and in the absence of signs of systemic illness suggests the common "irritable bowel syndrome," especially when the alteration varies between diarrhea and constipation. Small, pellet-like stools are often described by the patient. Associated symptoms of dyspepsia (bloating, nausea, and "gas") are also common. This diagnosis can essentially be made on the basis of a thorough history and physical examination and very limited laboratory testing, to exclude structural disease. In contrast, the onset of worsening constipation in an adult with previously regular habits, especially when accompanied by systemic symptoms such as weight loss, suggests the possible presence of an underlying obstructing process, particularly malignancy. If diarrhea is present, one should determine the average number of stools, their consistency, their pattern, and the presence or absence of blood. Although ***diarrhea*** refers to an increased frequency of movements, patients will often use the term to describe loose or watery stools. The occurrence of nocturnal or true bloody diarrhea almost always reflects structural rather than functional bowel disease. A pungent stool odor or the presence of undigested meat in the movement is suggestive of pancreatic insufficiency. An alteration in color can be seen in cholestasis or steatorrhea (light-colored) or hemorrhage (melenic to maroon or bright red). Mucus in the movement is usually a sign of a functional bowel syndrome, while pus is more strongly suggestive of infectious or inflammatory disease. Less common but more dramatic are the symptoms of acute GI bleeding, including hematemesis, melena, and hematochezia, which usually lead to prompt efforts to find medical attention but should always be enquired after by the clinician [20].

In the evaluation of male patients, especially those with diarrhea, a tactful inquiry into sexual activity is essential. Homosexual males are at increased risk for a large variety of GI disorders, as well as AIDS, which may first manifest itself with GI symptoms. Such symptoms, especially diarrhea, are common in patients with AIDS. These patients are susceptible to a wide range of infections and neoplastic disorders of the GI tract, liver and biliary tract. Careful attention must be given to a general medical history with an emphasis on present or past use of medications or nonprescription drugs. Thyroid and other metabolic disorders, especially that affecting calcium metabolism, can cause a variety of GI symptoms. Unless asked, patients may forget to mention that they take aspirin almost daily for headache, and this may account for occult blood found in the stool. The use of daily laxatives may explain chronic diarrhea.

Physical Examination, Endoscopy, and Radiology. All of the cardinal methods of examination are helpful in evaluating the patient with GI symptoms. *Inspection* may disclose signs of cholestasis or nutritional deficiencies. Examination of the abdomen for an abnormal contour or inspection of the perianal region may reveal signs of a mass or a draining fistula. *Auscultation* is also important. A succussion splash may be elicited in the patients with symptoms of gastric outlet obstruction. The absence of bowel sounds or an alteration in pitch can lead to recognition of an evolving ileus or an obstructing process. A bruit may also be appreciated where there are symptoms of ischemic bowel disease. Careful *palpation* of the abdomen is especially important in detecting tenderness and masses, which in the appropriate clinical setting will lead to the recognition of cholecystitis, Crohn's disease, periappendiceal abscess, and many other disorders. Findings on abdominal palpation will often be complemented by *percussion,* which is essential to assessing liver and spleen size [5,20].

Elicitation of *rebound tenderness*, either direct or referred, after removal of the examining hand provides an important clue to localized or more generalized peritonitis, which is characteristic of many abdominal emergencies, including a perforated viscus, intraabdominal abscess, or tissue infarction. The clinician should be particularly alert to these signs in patients with severe pain of abrupt onset. Typically, the patient will remain immobile to avoid the accentuation of pain that may follow even slight movement and jarring of the abdomen. This contrasts with the sometimes frantic efforts to find a position of comfort in patients with severe pain deriving from visceral disease, e.g., pancreatitis or intestinal ischemia. In these disorders, the absence of findings on palpation of the abdomen may be in striking contrast to the evident distress of the patient. Only when the process progresses to tissue destruction (e.g., necrotizing pancreatitis or intestinal infarction) and secondary peritonitis will the abdominal examination prove remarkable, often in concert with striking signs of systemic illness, including hemodynamic instability. In addition to the examination of the abdomen, a carefully performed digital rectal examination is also essential. In the patient with

complaints of incontinence, the integrity of the sphincter can be assessed. Most important, masses intrinsic to the rectum as well as abnormalities in the pelvis or the pouch of Douglas may only be detected by this examination, and the presence or absence of frank or occult blood in the stool is always important diagnostic information. Sigmoidoscopy should be viewed as a routine part of the physical examination in the patient with diarrhea or another alteration in bowel habit as well as when there is known or suspected blood loss from the lower bowel. Sigmoidoscopy, which can be performed with either a rigid or a flexible fiberoptic instrument, allows for direct inspection of the rectosigmoid mucosa, permitting the detection of cancers and polyps in this lower bowel segment that might well be missed by barium x-rays. Inflammatory changes of the mucosa can help identify patients with infectious dysentery or other forms of colitis, most notably ulcerative colitis. The findings of edema, granularity, and diffuse friability (easily induced mucosal bleeding) as well as superficial ulcerations are characteristic of the latter disorder. Fresh stool samples for microbiologic studies and superficial mucosal biopsies obtained at the time of sigmoidoscopy can also yield crucial diagnostic information [7,20].

Table 2

Distinguishing between Functional and Organic/Structural Disease of Gastrointestinal Tract

Symptoms	Functional	Organic	
		Neoplastic	Inflammatory
Weight loss	None	Common	Sometimes
Diarrhea	Daytime only	Nocturnal	Day and night
Blood loss	None	Frequent	Frequent
Fever	None	Rare	Frequent
Pain	Cramping, relieved by defecation	Minor to severe	May be localized; may be severe
Bowel habit (diarrhea or constipation)	Alternating diarrhea/ constipation Pellet-like stools	Constipation (rarely diarrhea) Change in caliber	Diarrhea or normal
Laboratory tests			
Hematocrit	Normal	Often decreased	May be decreased
White blood cell count	Normal	Usually normal	Often elevated
Erythrocyte sedimentation rate	Normal	Usually increased	Usually increased

Definitive demonstration or exclusion of structural lesions of the GI tract, particularly the great majority of disorders that affect primarily the mucosal surface, often cannot be accomplished by physical examination alone. Many upper and lower GI

tract disorders are accessible to inspection via fiberoptic instruments. As a result, endoscopy has supplanted conventional contrast x-ray studies for many clinical problems, both because of its heightened precision for diagnosis and the opportunity in many instances to accomplish meaningful therapeutic intervention. However, it should be emphasized that *no procedure should be considered routine* and used indiscriminately; there must be a rational basis for its use in the individual patient. Upper GI endoscopy permits evaluation of the esophagus, stomach, duodenum, and, with specially designed instruments, proximal jejunum. When the clinical history warrants a diagnostic examination of the upper GI tract for a structural lesion, endoscopic examination is preferable to radiologic study in most patients when the choice is available. Side-viewing scopes permit inspection and cannulation of the ampulla of Vater, facilitating retrograde cholangiopancreatography. Evaluation of some patients will be further benefited by endoscopic ultrasound, which can delineate submucosal mass lesions and abnormalities in the pancreas. The colonoscope can be used to visualize the entire colon and often the terminal ileum, resulting in more accurate diagnosis of inflammatory bowel disease and mass lesions. Frequently, colonic polyps can be removed at the time of their initial identification [1,6].

Endoscopic techniques are relatively precise in defining many problems, but the limitations of these tools, as well as the continued advantages of x-ray studies in some situations, should be recognized. Endoscopic tools are not useful in assessing GI motility, which may be assessed more accurately by barium studies. In addition, some areas, notably the small intestine, remain relatively inaccessible to fiberoptic instruments. In hospitals where endoscopy is not feasible, the upper GI series and barium enema remain good diagnostic modalities to evaluate the upper and lower GI tract, especially when air-contrast techniques are employed. However, they should generally be avoided in patients with GI bleeding or suspected bowel obstruction. In addition the physician must exercise judgment in preparing the patient for these studies, recognizing that cathartics may markedly worsen the condition of a patient with obstructing lesions or colitis.

Although endoscopy has obviated the need for many conventional GI x- rays, other radiologic imaging modalities have assumed a crucial role in the approach to the patient with GI symptoms. These techniques include ultrasound (US), computed tomography (CT), and magnetic resonance imaging (MRI). Both US and CT are useful in the delineation of abdominal masses. CT, though more expensive, is often more effective in the evaluation of the lower abdomen, where inflammatory masses in patients with Crohn's disease or complications of diverticular disease may be accurately

imaged. However, US is an effective and less expensive tool for the evaluation of the right upper quadrant, including the gall bladder and biliary tract. Imaging techniques are often complementary in the evaluation of pancreatic disease. In combination with Doppler analysis, US can be used to assess the patency and direction of blood flow in the portal vein in the patient with advanced liver disease. MRI may give exquisitely accurate information on the anatomic extent of invasive rectal cancers and blood flow in patients with vascular disorders, but the full range of its uses in GI disorders remains to be delineated. More sophisticated CT and MRI equipment can actually permit the performance of digital angiography without the invasive catheterization necessary in conventional visceral angiography [7].

Diagnostic approaches. Abdominal Pain. Determination of the cause of abdominal pain remains an imposing clinical challenge. Disorders ranging from the acute and catastrophic to the chronic and indolent can cause abdominal pain. Furthermore, differential diagnostic considerations may encompass diseases extrinsic to the G1 tract, such as disorders of the genitourinary tract (e.g., pelvic inflammatory disease) and the peritoneum. The history and physical examination are essential guides to a sensible diagnostic approach. The initial goal is to distinguish between an urgent problem requiring expeditious delineation and a non-acute disorder. In the former situation, initial clinical impressions based on the history and physical examination can be further refined through routine laboratory tests such as a complete blood count and differential as well as plain films of the abdomen. Particular features will dictate the appropriateness of urgent US or CT examination or the need to proceed promptly with surgery. In the patient with a long-standing and relatively stable problem, diagnostic evaluation can be more deliberate. The clinician may be able to reasonably establish a functional basis for the complaint on the strength of the history and physical examination alone. Radiologic contrast studies, other imaging modalities (e.g., US, CT), or endoscopic examination may be appropriate to exclude or identify certain of the gamut of disorders discussed above. If all these approaches do not determine the cause of the patient's symptoms, more unusual causes of abdominal pain may have to be excluded through specific urine or blood tests (e.g., porphyrins) [4,7].

Table 3

Overview of Approach to Patients with Common Gastrointestinal Disorders

Site of Disorder	Common Symptoms	Possible Physical Signs	Potential Procedures or Laboratory Studies
Esophagus	Dysphagia Odynophagia Heartburn, chest pain Hematemesis/melena		Esophagoscopy Barium swallow Manometry Bernstein test
Stomach	Nausea and vomiting Epigastric pain Hematemesis/melena Early satiety	Distention Tenderness Succusion splash Mass	Gastroscopy Upper GI x-ray series Nasogastric aspiration Gastric emptying
Pancreas	Pain Weight loss Diarrhea Steatorrhea	Mass Jaundice	Kidney-ureter-bladder x-ray series Qualitative stool fat and muscle fiber US, CT, MRI, endoscopic retrograde cholangiopancreatography Pancreatic function tests
Small Intestine Duodenum	Pain Nausea/vomiting Hematemesis	Tenderness Altered bowel sounds Distention Mass	Duodenoscopy Small bowel follow-through, enteroclysis Kidney-ureter-bladder x-ray series D-Xylose absorption tests
Jejunum	Pain Diarrhea	Altered bowel sounds Distention Mass	CT Stool cultures, stool examination for ova and parasites Small bowel biopsy
Ileum	Pain Diarrhea	Altered bowel sounds Distention Mass	
Colon	Diarrhea Pain Blood	Tenderness Mass Distention	Sigmoidoscopy Colonoscopy Barium enema Stool culture, stool examination for ova and parasites *Clostridium difficile* toxin assay
Rectum	Pain Urgency Hematochezia Pruritus	Tenderness	Sigmoidoscopy Anoscopy

Site of Disorder	Common Symptoms	Possible Physical Signs	Potential Procedures or Laboratory Studies
Nonspecific	Weight loss Fever Anorexia Nausea and vomiting		Complete blood count Erythrocyte sedimentation rate Fecal occult blood test

Problems of Swallowing. The approach should be as follows:

1. *Thorough determination of the nature of dysphagia.* Is the difficulty primarily in swallowing liquids, solids, or both? The location of the difficulty from the patient's perspective and presence or absence of accompanying *odynophagia* are important to ascertain. These historical clues are complemented by careful visual and neurologic examination of the oropharynx when appropriate.

2. *Routine esophageal x-rays* in the upright and lateral or Trendelenburg position. The horizontal views are essential for demonstration of the swallowing mechanism, unaided by gravity, and of the esophagogastric junction. For details of the pharyngoesophageal area, cineradiography is necessary because of the rapidity with which the contrast medium passes through. Hiatus hernia is extremely common (in 15 to 35% of persons over 50%) and often is asymptomatic unless spontaneous reflux of gastric contents can be demonstrated to occur repeatedly. Careful attention is usually needed to detect lower esophageal rings or webs, which may be visible as indentations in the barium column only from a limited angle.

3. *Esophagoscopy.* This procedure is desirable for lesions suggested by x-ray or, if the lesion is unsuspected, to biopsy masses or abnormal mucosa and to obtain washings for exfoliative cytologic study. The diagnoses of peptic esophagitis and Barrett's esophagus are made endoscopically. Endoscopy is the most sensitive technique for identifying esophageal or gastric varices, although they are seldom important in the absence of hemorrhage. Fiberoptic instruments with a US probe at the tip (endoscopic ultrasound) are increasingly useful diagnostic tools for particular problems of the esophagus (and other sites of the GI tract).

4. *Manometric studies* of the upper esophagus, particularly in conjunction with cineradiography. At present, this procedure offers the best means of differentiating among disorders originating in the central nervous system, primary pharyngeal muscular disease, and cricopharyngeal dystonia. Manometry of the lower esophagus is useful in the diagnosis of diffuse esophageal spasm, achalasia, and infiltrative diseases that can alter esophageal motility [20].

Peptic or Digestive Disorders. The approaches to these disorders include the following.

1. *Insertion of a nasograstric tube.* This approach is used to establish whether significant gastric retention (more than 75 mL of gastric contents in the fasting state) exists and whether acid, bile, blood, or other materials are present. If pyloric obstruction or gastric atony is present, the tube is used to maintain suction while the patient's

electrolyte and fluid balance is restored to normal; the stomach is kept as clean as possible so that reliable diagnostic investigation may be carried out [1].

2. *Upper gastrointestinal endoscopy.* This procedure is most helpful in assessing the mucosa in gastritis or, together with biopsy and brushings for cytology, in differentiating between peptic and neoplastic ulcerating lesions. It may identify a specific bleeding site in clinical situations where several potential bleeding sites could exist, as in the patient with portal hypertension. In addition, it may be possible to cauterize or otherwise intervene to control hemorrhage via the endoscope (e.g., by injections of vasoconstricting agents such as epinephrine). The frequent association of gastritis with *Helicobacter pylori* in patients with actual peptic ulceration, as well as in those with nonulcer dyspepsia, has been well documented. Although, at this time, *H. pylori* infection can be most reliably confirmed in the individual patient by endoscopy and biopsy, this approach may be superseded by other, less invasive modalities including breath and serologic tests. Endoscopy can detect a number of potential sources of upper GI bleeding that are often missed by x-ray studies (e.g., erosive gastritis, Mallory-Weiss tear). Gastroscopy is particularly helpful in inspecting the postoperative stomach, especially in detecting stomal ulceration or so-called alkaline reflux gastritis. The first and second portions of the duodenum can also be routinely examined, and important information about ulcers and other lesions can be obtained. Radiologic studies may be useful when endoscopy is not readily available or in the assessment of suspected motility disorders (e.g., gastroparesis). In addition, radiologic examination may be preferred when there are contraindications to safe endoscopy.

3. *Gastric acid secretory studies.* Although not routinely necessary, these studies are useful in the diagnosis of the Zollinger-Ellison syndrome or atrophic gastritis and for determination of completeness of vagotomy. They should not be performed for the routine diagnosis of uncomplicated duodenal ulcer; also, there is no convincing evidence that they are useful in determining the choice of surgery for peptic ulcer [20].

Obstructive and Vascular Disorders of the Small Intestine

When intestinal problems present as obstructive syndromes, the plain x-ray film of the abdomen is the most important diagnostic adjunct to careful physical examination. Patterns of dilation of individual loops of intestine may be characteristic, as in volvulus or acute pancreatitis; erect and decubitus views will often show fluid levels in the affected segments. Motility disorders of the small intestine (temporary ileus or chronic intestinal pseudoobstruction) may also present with obstructive symptoms and similar x-ray findings but must be managed medically without surgical intervention. Air under the diaphragm is diagnostic of a perforated viscus; air in the portal vein usually results from intestinal necrosis secondary to mesenteric vascular occlusion. The diagnostic accuracy of the plain x-ray film in all types of intestinal obstruction is about 75%. In patients with symptoms of incomplete obstruction, the radiographic small-bowel series will often be diagnostic in defining the site and degree of obstruction.

Infrequently, in this setting, all conventional x-ray studies are unremarkable. In such cases, the radiologist may perform a small bowel enteroclysis study by passing a special tube into the proximal jejunum; the rapid instillation of barium through the tube will distend the intestine and often reveal subtle lesions missed by other tests.

Vascular diseases of the small intestine are among the most difficult diseases to diagnose. In chronic mesenteric ischemia, radiographic, endoscopic, and laboratory tests are usually normal. Early in the course of acute mesenteric ischemia, the plain film of the abdomen may be unremarkable despite complaints of severe abdominal pain. In these settings, prompt mesenteric angiography is essential to confirm the diagnosis of vascular disease [5,20].

Inflammatory and Neoplastic Diseases of Small and Large Intestine. These patients are usually identified by history, physical examination, and careful examination of the stools for exudate and blood. Examination of fresh stool samples for common bacterial pathogens and parasites by laboratories skilled in these techniques is important in identifying or excluding infectious causes of diarrhea, particularly in the patient with colitis. Sigmoidoscopy is valuable in identifying mucosal and neoplastic lesions of the rectum and distal colon. The mucosal surface of the entire colon and terminal ileum can be examined directly and biopsied through the fiberoptic sigmoidoscope or colonoscope. The radiologic examination of the small intestine is highly reliable in identifying the prestenotic and stenotic lesions of Crohn's disease. In the colon, a single barium enema examination in a well-prepared patient has a diagnostic accuracy of 80-85%; the addition of air-contrast technique brings the accuracy up over 90%. None of these figures is meaningful if the patient is poorly prepared for the examination, however. Colonoscopy may be preferable because of its greater accuracy and the fact that it enables the operator to remove the vast majority of polyps that are encountered as well as to obtain preoperative tissue confirmation in the patient who probably has cancer.

Peroral biopsy of the small intestine and forceps biopsy of the rectosigmoid are of considerable importance in revealing mucosal disease. Rectal biopsy is an excellent means of demonstrating amyloidosis, schistosomiasis, and amebiasis. Submucosal disease is not seen in these superficial biopsies. Hirschsprung's disease is diagnosed histologically by a deep surgical biopsy of the lower part of the rectum [7].

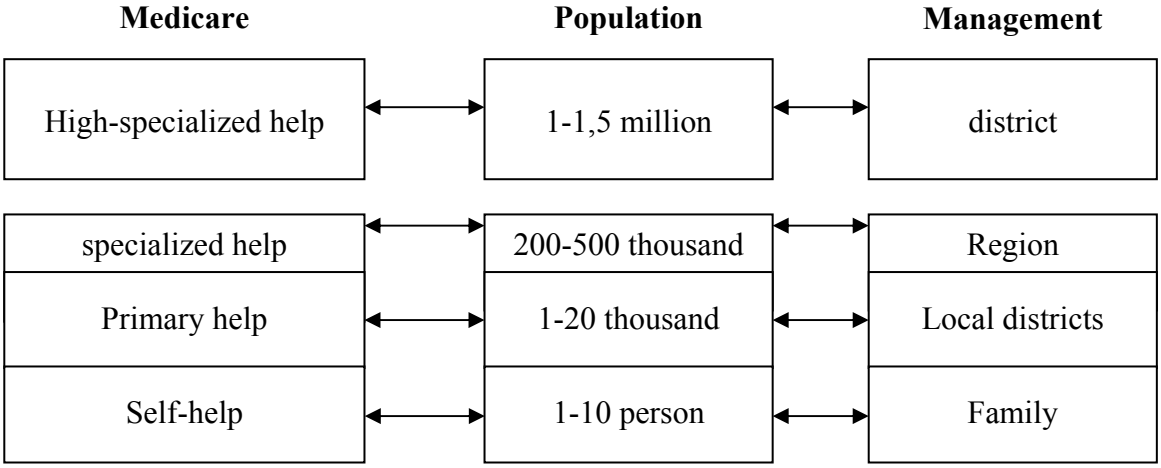
Malabsorption Syndromes may be suspected on the basis of history and physical examination and confirmed by examination of the stool. Radiologic examination is helpful to rule out local lesions and to suggest motor and secretory dysfunction, but it is rarely diagnostic unless an abnormal small bowel mucosa or fistulas between the intestine and stomach are demonstrated [20].

A simple screening test for excessive fat in the stools can be accomplished by the microscopic examination of a stool specimen stained with Sudan. Chemical analysis of 3-day stool collection for fat, with the patient on a standard diet, is used to establish the diagnosis of steatorrhea. The D-xylose absorption test is about 90% accurate in

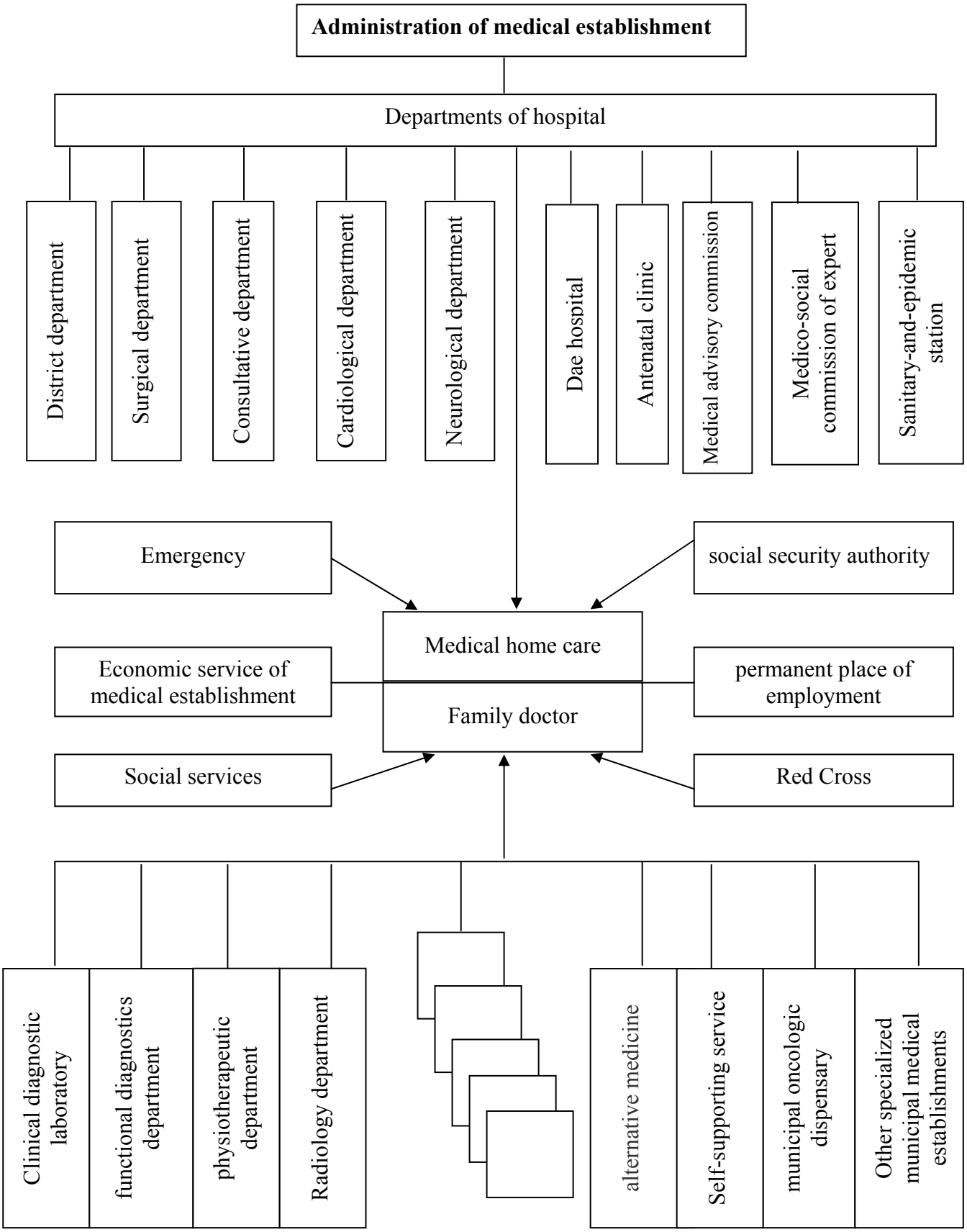
distinguishing mucosal disease from pancreatic insufficiency. Peroral biopsy of the small intestine via the endoscope or a specialized biopsy device is of value in the diagnosis of celiac disease, and it may show the less common infiltrations of the mucosa by amyloid or bacterial mucoproteins (Whipple's disease). Leakage of protein into the intestinal lumen may cause hypoproteinemia and can be demonstrated by the recovery in stools of the serum protein a_r-antitrypsin or intravenously administrated markers such as albumin labeled with iodine or chromium isotopes [6,20].

Pancreas is difficult to study because of its anatomic location and relative inaccessibility. Calcification of the pancreas on a plain abdominal film is highly suggestive of chronic pancreatitis and may be associated with fat malabsorption. Pancreatic exocrine insufficiency can be demonstrated by intubation of the duodenum and collection of pancreatic juice after stimulation with secretin or a test meal, but a stool collection for qualitative determination of fat and muscle fiber content is usually sufficient as an initial diagnostic approach. Abdominal US and CT are the best radiographic means of searching for pancreatic enlargement. Both techniques may also be used to guide needle biopsies of the pancreas and may provide sufficient diagnostic information to obviate the need for exploratory surgery. The pancreatic duct can be cannulated via the fiberoptic duodenoscope and visualized by the injection of radiographic dye. Visualization of the duct may be helpful in the diagnosis of pancreatic pseudocysts, carcinoma, or chronic pancreatitis [2,7].

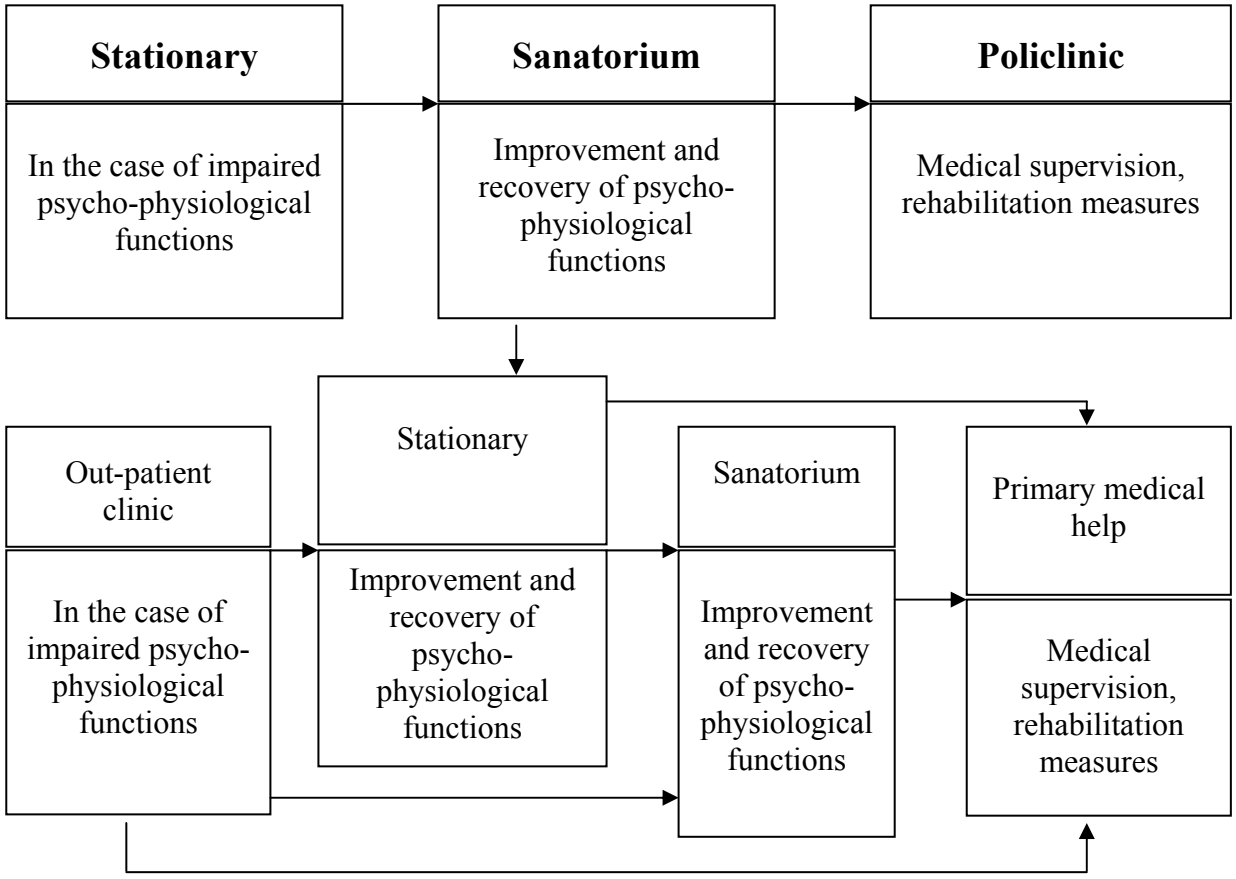
The grants of medical care, population, and administrative management



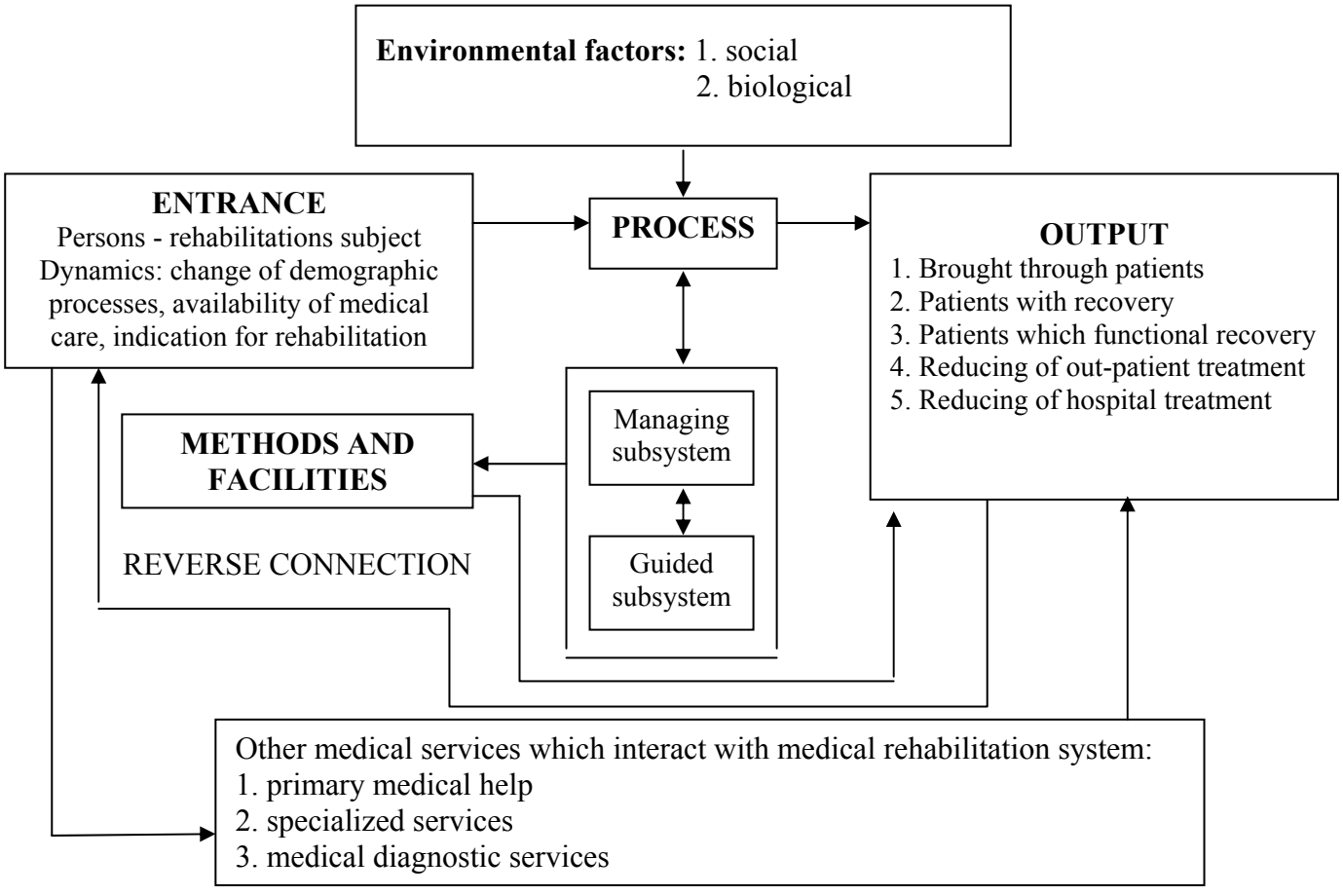
Intercommunication of district hospital with structural subdivisions of medical establishment and other institutions



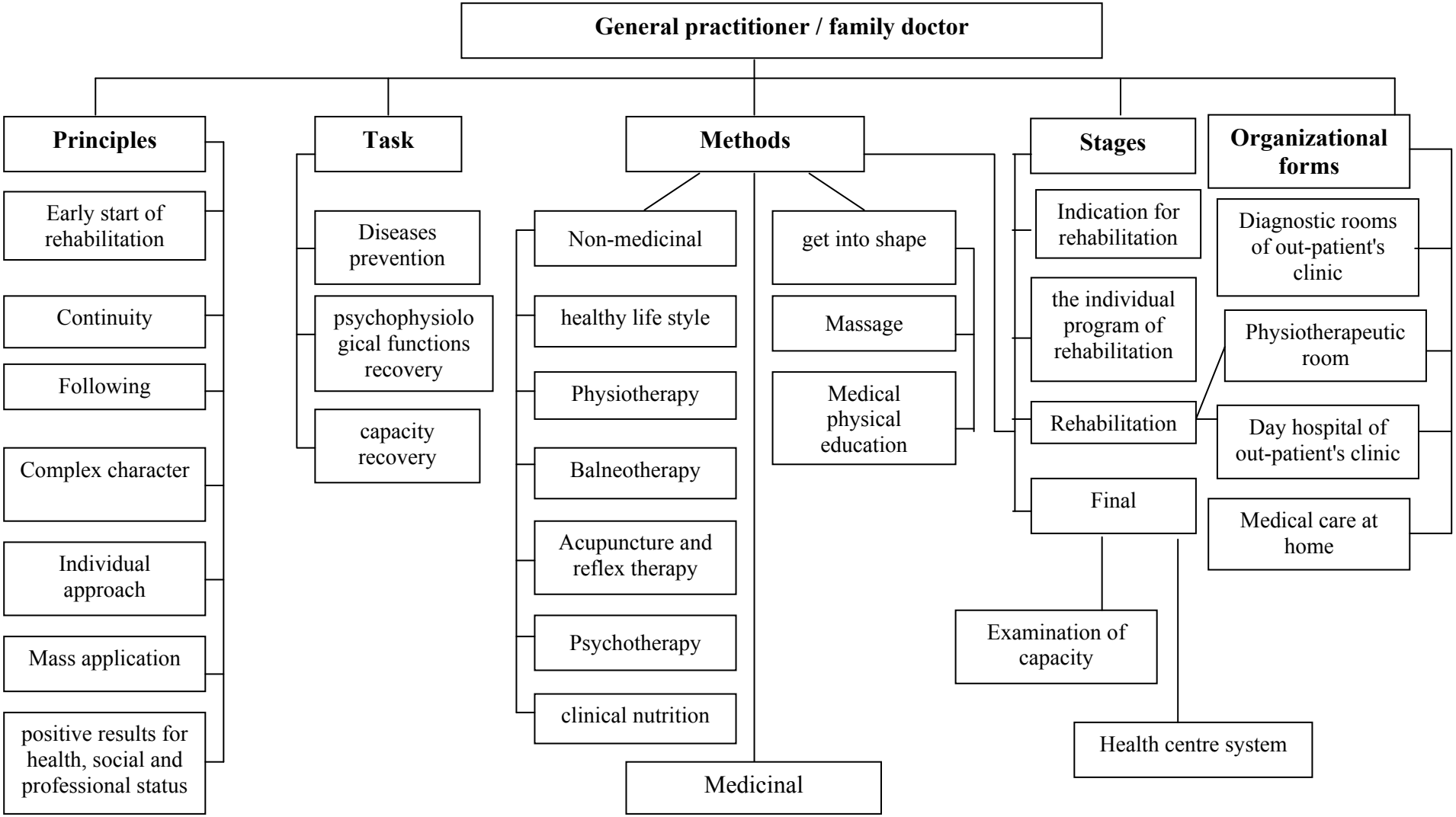
Transformation of the stages of realization of medical rehabilitation



Medical rehabilitation structure



Functional organizational model of medical rehabilitation at the level of primary medical help



X. Tasks for final control

Task 1. 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 0,8 x 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

1.2. 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

1.3. 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

Task 2. 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.

2.1. At roentgenologic research in resulted case it is possible to educe all signs, except:

A. to smooth out waist of heart
B. shadow of heart as "sabo" (wooden boot)
C. of ncrease of the left ventricle
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

2.2. 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

2.3. 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

2.4. 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

2.5. 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 3. The patient of 25 years old appealed to the family doctor with complaints about pain and swelling up in right knee joint and interphalangeal joints of right foot, rise body temperature to 37,8^{0}C, sickliness. It is ill 2 weeks. To it privately treated oneself concerning appearance of mucous-festering excretions from an urethra, periodically feeling of "sand appeared in eyes". Objectively: general case satisfactory. Temperature of body 37,3^{0}C. On a skin single psoriatic eruption a to 5 mm in a diameter. Conjunctiva of hyperemic, injection scleras. The limits of heart are not changed. Tones of heart are stored, on an apex heard systolic "cliques". Deformation of right knee-joint, interphalangeal joints of right foot.

3.1. Your previous diagnosis will be:

A. rheumatic fever, insufficiency mitral valve, rheumatic arthritis

B. rheumatoid arthritis

C. disease of Reiter

D. gonococcus arthritis
E. psoriatic arthritis
3.2. Define the etiologic factor of this disease
A. enterovirus
B. streptococcus agalactiae
C. gonococcus
D. chlamydiales
E. not one of resulted
3.3. Define the further tactic of conduct patient:
A. to refer at treatment to dermatovenereologist
B. to refer to rheumatology/therapeutic hospital
C. ambulatory treatment without to the medical certificate
D. treatment on daily hospital
E. ambulatory treatment with to the medical certificate
3.4. Appoint the plan of treatment:
A. meloksicam 15 mg on twenty-four hours
B. azitromicini a 1 g peroral non-permanent + meloksicam 15 mg on twenty-four hours
C. prednizaloni of 30 mg on twenty-four hours
D. penicillin 3 millions/twenty-four hours intramuscular + celecocsib 400 mg on twenty-four hours
E. treatment of psoriasis according to recommendations of dermatovenereologist + celecocsib 400 mg on twenty-four hours

Task 4. 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 5. 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 6. Basic difference II A stages of heart failure on a left-sided type from one stages:
A. rice ABP
B. emergence peripheral edemata (transit)
C. tachicardia in a state of rest
D. symptom to engorgement in the greater circulation
E. symptom to engorgement in the lesser circulation

Task 7. What forms of chronic glomerulonephritis not is appointed at a heparin
A. with an urinary syndrome, progressive course
B. with a hematuria syndrome
C. with a nephrotic syndrome in any stage
D. with a nephrotic syndrome in the stage of chronic renal failure
E. with an urinary syndrome in the stage of chronic renal failure

Task 8. In principles treatment of the second chronic pyelonephritis enters all, except for:
A. renewal and normalization of passage of urine
B. diuretics
C. immunomodulators
D. glucocortikoids

Task 9. 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

Task 10. Office worker as a result of high fever and indisposition did not go out on work. Called to the family doctor home and asked to open the medical certificate. At implementation of what condition can a doctor give out the medical certificate?
A. on the basis of conclusion of medical-consultative commission;
B. at presence of record in "Magazine of account of calls of doctors home";

C. after the personal review of patient by a treating doctor;

D. at presence of results of blood, urine and fluorography test;

E. after passing of complex medical review.

Answers:

1.1	1.2	1.3	2.1	2.2	2.3	2.4	2.5	3.1	3.2
D	E	C	B	C	E	B	A	C	D
3.3	3.4	4	5	6	7	8	9	10	
E	B	C	E	E	E	D	A	C	

XI. Final level

Task 1.

The patient of 53 years grumbles about feeling of weight in epigastric area, periodic nausea, annoying smack in to the mouth, unsteady chair, emaciation, bad appetite. It is ill 7 years, treated oneself independently after folk recipes. Worsening marks during two weeks. Objectively: sufficient feed, a skin is moist; peripheral lymphonodus not palpation. At palpation - the insignificant is painfulness in epigastric area.

1.1. Taking into account resulted information, you diagnose:

A. unexplored gastric dyspepsia

B. chronic unatrophy gastritis, normoacidis state

C. cancer of stomach

D. chronic atrophic gastritis, hypoacidis state

E. chronic atrophic gastritis, unacidis state

1.2. In accordance with a select diagnosis specify on reliable changes which can be at roentgenologic investigational stomach for this patient:

A. to smooth of plica, shortening and narrowing of antral divisio, a peristalsis absents in this area.

B. of plica of ordinary form, evacuation is a speed-up

C. to smooth of plica, evacuation low-spirited, pylorus to hiatus.

D. at the antral divisio to smooth of plica, uneven tumour

E. thickening of plica, a peristalsis is safe.

1.3. What obligatory laboratory research must be done foremost:

A. determination of activity of enzymes of pancreas

B. determination of reaction of Gregersen

C. determination of content in blood of gastrin

D. determination of titer of antibodies to the lamblias

E. determination presence of H. pylori infection

1.4. Define a further medical tactic:

A. foremost to conduct the computer tomography of organs of abdominal cavity

B. realization of finish examining patient with further medicinal treatment
C. realization of finish examining patient with further direction to the specialist
D. ambulatory symptomatic treatment and continuation of finish examining
E. planning surgical operation

Task 2.

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
E. valuing to efficiency of therapy
F. enumeration in A, B, E.
G. enumeration in A, B, C, D, E.

Task 3.

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

Task 4.

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

Task 5.

The most characteristic pathology of kidneys is at diabetes mellitus:
A. Chronic pyelonephritis
B. renal amyloidosis

C. glomerulosclerosis
D. glomerulonefritis

Task 6.

A patient is 55 years with an acute pyelonephritis on a background the urolithiasis. What complex of researches do you count after a necessity to conduct?

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

Task 7.

The main clinical symptom of chronic obstructive pulmonary disease is all, except for:

A. dyspnea
B. constant or periodic cough
C. expectoration availability
D. choke seizure
E. rise temperatures

Task 8.

To primary atypical pneumonias take:

A. mycoplasmal
B. legionellal
C. chlamydial
D. staphylococcal
E. pneumococcal
F. right A, B, C

Task 9.

For what anemia a blood test is characteristic: 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/hour., anisocytosis +++, hypochromic microcytosis?

A. hypoplastic

B. iron deficiency
C. megaloblastic
D. hemolytic

Task 10.

Worker 37 years, appealed to the family doctor of 04.10.2009. Became ill 2 days to the volume, a doctor diagnosed: acute bronchitis. During the second meeting with a doctor the state of patient became worse, a patient had been sent to stationary treatment with a diagnosis: pneumonia. In hospital a patient was 16 days, was whereupon written to work. How to design a disability to this patient?

A. From 02.10.2009 to 04.10.2009 a paper is designed. From 04.10.2009 to 26.10.2009 is a medical certificate;
B. From 02.10.2009 to 04.10.2009 a paper is designed. From 04.10.2009 to 09.10.2009 the first medical certificate is designed in a family out-patient's clinic, from 10.10.2009 is the second medical certificate in hospital;
C. Designed 2 medical certificates: first - in a family out-patient's clinic from 04.10.2009 to 06.10.2009, second - in hospital from 07.10.2009 to 22.10.2009;
D. Designed 2 medical certificates: first - in a family out-patient's clinic from 04.10.2009 to 09.10.2009, second - in a family out-patient's clinic from 10.10.2009 to 25.10.2009;
E. Designed one medical certificate from 04.10.2009 to 25.10.2009.

Answers:

1.1	1.2	1.3	1.4	2	3	4
D	C	C	B	G	A	A
5	6	7	8	9	10	
C	C	E	F	B	C	

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