Ministry of Health of the Russian Federation

Federal State Budgetary
Educational Institution of Higher Education
«Northern State Medical University»
of the Ministry of Health of the Russian Federation

N.A. Vorobyeva, A.A. Shchapkov

Evidence-based medicine in modern clinical practice: achievements and problems

Study guide

Arkhangelsk
2023

UDC 61

Authors:
N.A. Vorobyeva, MD, Professor, Head of the Department of Clinical Pharmacology and Pharmacotherapy of NSMU;
A.A. Shchapkov, Assistant of the Department of Clinical Pharmacology and Pharmacotherapy of NSMU

Reviewers:
V.V. Kuzkov, MD, PhD, Professor, Department of Anesthesiology and Intensive Care, Northern State Medical University, Russian Federation;
O.A. Kharkova, PhD, Associate professor, Department of research methods, Northern State Medical University

Published according of the decision of the editorial and publishing council of the Northern State Medical University

Vorobyeva N.A.
Evidence-based medicine in modern clinical practice: achievements and problems: study guide / N.A. Vorobyeva, A.A. Shchapkov. – Arkhangelsk: NSMU Publishing, 2023. – 202 p.
ISBN 978-5-91702-504-9

The guidebook presents the basic principles and methodology of evidence-based medicine in clinical practice, the importance of epidemiological and clinical studies, and provides data on the search for medical information.

The textbook is intended for students in the specialty 31.05.01 Medicine, 31.05.02 Pediatrics, can also be used for students in the specialty 33.05.01 Pharmacy.

UDC 61

ISBN 978-5-91702-504-9

Министерство здравоохранения Российской Федерации

Федеральное государственное бюджетное
образовательное учреждение высшего образования
«Северный государственный медицинский университет»
Министерства здравоохранения Российской Федерации

Н.А. Воробьева, А.А. Щапков

Доказательная медицина в современной клинической практике: достижения и проблемы

Учебное пособие

Архангельск
2023

УДК 61
ББК 53
В 75

Авторы: ***Н.А. Воробьева***, доктор медицинских наук, профессор, заведующая кафедрой клинической фармакологии и фармакотерапии СГМУ; ***А.А. Щапков***, ассистент кафедры клинической фармакологии и фармакотерапии СГМУ

Рецензенты: ***В.В. Кузьков***, доктор медицинских наук, профессор кафедры анестезиологии и интенсивной терапии Северного государственного медицинского университета; ***О.А. Харькова***, кандидат психологических наук, доцент кафедры методологии научных исследований Северного государственного медицинского университета

Печатается по решению редакционно-издательского совета
Северного государственного медицинского университета

Воробьева Н.А.

В 75 Доказательная медицина в современной клинической практике: достижения и проблемы: учебное пособие / Н.А. Воробьева, А.А. Щапков. – Архангельск: Изд-во Северного государственного медицинского университета, 2023. – 202 с.

ISBN 978-5-91702-504-9

В пособии представлены основные принципы и методология доказательной медицины в клинической практике, важность эпидемиологических и клинических исследований, а также приведены данные по поиску медицинской информации.

Издание предназначено для студентов по специальности 31.05.01 – Медицина, 31.05.02 – Педиатрия, также может быть использовано для студентов по специальности 33.05.01 – Фармация.

УДК 61
ББК 53

ISBN 978-5-91702-504-9

TABLE OF CONTENTS

LIST OF ABBREVIATIONS

AGREE – Appraisal of Guidelines Research and Evaluation;
BP – blood pressure;
DB – databases;
WHO – World Health Organization;
EBM – evidence-based medicine;
ISE – information and search engines;
NCDs – non-communicable diseases;
GCP – Good clinical practice;
IEC – Independent Ethics Committee;
NRP – an undesirable reaction to the drug;
NYA is an undesirable phenomenon;
RR – relative risk;
OR – odds ratio;
RCTs – randomized clinical trials;
RAR – reduction of absolute risk;
RRR – reduction of relative risk;
CVD – cardiovascular diseases;
FIC- form of informed consent;
NNT for benefit- the number of patients who need to be treated to obtain a favorable outcome;
NNT for harm – the number of patients who need to be treated to obtain an unfavorable outcome;
ECO – the expert council of the organization.

GLOSSARY OF CLINICAL TRIALS TERMS

The following glossary was prepared to help the consumer become familiar with many of the common terms used in clinical trials.

ADVERSE REACTION: (Adverse Event.) An unwanted effect caused by the administration of drugs. Onset may be sudden or develop over time (See **Side Effects**).

ADVOCACY AND SUPPORT GROUPS: Organizations and groups that actively support participants and their families with valuable resources, including self-empowerment and survival tools.

APPROVED DRUGS: In the U.S., the Food and Drug Administration (FDA) must approve a substance as a drug before it can be marketed. The approval process involves several steps including pre-clinical laboratory and animal studies, clinical trials for safety and efficacy, filing of a New Drug Application by the manufacturer of the drug, FDA review of the application, and FDA approval/rejection of application (See **Food and Drug Administration**).

ARM: Any of the treatment groups in a randomized trial. Most randomized trials have two «arms,» but some have three «arms,» or even more (See **Randomized Trial**).

BASELINE: 1. Information gathered at the beginning of a study from which variations found in the study are measured. 2. A known value or quantity with which an unknown is compared when measured or assessed. 3. The initial time point in a clinical trial, just before a participant starts to receive the experimental treatment which is being tested. At this reference point, measurable values such as CD4 count are recorded. Safety and efficacy of a drug are often determined by monitoring changes from the baseline values.

BIAS: When a point of view prevents impartial judgment on issues relating to the subject of that point of view. In clinical studies, bias is controlled by blinding and randomization (See **Blind** and **Randomization**).

BLIND: A randomized trial is «Blind» if the participant is not told which arm of the trial he is on. A clinical trial is «Blind» if participants are unaware on whether they are in the experimental or control arm of the study; also called masked. (See **Single Blind Study** and **Double Blind Study**).

CLINICAL: Pertaining to or founded on observation and treatment of participants, as distinguished from theoretical or basic science.

CLINICAL ENDPOINT: See **Endpoint**.

CLINICAL INVESTIGATOR: A medical researcher in charge of carrying out a clinical trial's protocol.

CLINICAL TRIAL: A clinical trial is a research study to answer specific questions about vaccines or new therapies or new ways of using known treatments. Clinical trials (also called medical research and research studies) are used to determine whether new drugs or treatments are both safe and effective. Carefully conducted clinical trials are the fastest and safest way to find treatments that work in people. Trials are in four phases: Phase 1 tests a new drug or treatment in a small group; Phase 2 expands the study to a larger group of people; Phase 3 expands the study to an even larger group of people; and Phase IV takes place after the drug or treatment has been licensed and marketed. (See **Phase 1**, **2**, **3**, and **4 Trials**).

COHORT: In epidemiology, a group of individuals with some characteristics in common.

COMMUNITY-BASED CLINICAL TRIAL (CBCT): A clinical trial conducted primarily through primary-care physicians rather than academic research facilities.

COMPASSIONATE USE: A method of providing experimental therapeutics prior to final FDA approval for use in humans. This procedure is used with very sick individuals who have no other treatment options. Often, case-by-case approval must be obtained from the FDA for «compassionate use» of a drug or therapy.

COMPLEMENTARY AND ALTERNATIVE THERAPY: Broad range of healing philosophies, approaches, and therapies that Western (conventional) medicine does not commonly use to promote well-being or treat health conditions. Examples include acupuncture, herbs, etc. Internet Address: **http://www.nccam.nih.gov**.

COMPLETED: See **Recruitment Status**

CONFIDENTIALITY REGARDING TRIAL PARTICIPANTS: Refers to maintaining the confidentiality of trial participants including their personal identity and all personal medical information. The trial participants' consent to the use of records for data verification purposes

should be obtained prior to the trial and assurance must be given that confidentiality will be maintained.

CONTRAINDICATION: A specific circumstance when the use of certain treatments could be harmful.

CONTROL: A control is the nature of the intervention control.

CONTROL GROUP: The standard by which experimental observations are evaluated. In many clinical trials, one group of patients will be given an experimental drug or treatment, while the control group is given either a standard treatment for the illness or a placebo (See **Placebo** and **Standard Treatment**).

CONTROLLED TRIALS: Control is a standard against which experimental observations may be evaluated. In clinical trials, one group of participants is given an experimental drug, while another group (i.e., the control group) is given either a standard treatment for the disease or a placebo.

DATA SAFETY AND MONITORING BOARD (DSMB): An independent committee, composed of community representatives and clinical research experts, that reviews data while a clinical trial is in progress to ensure that participants are not exposed to undue risk. A DSMB may recommend that a trial be stopped if there are safety concerns or if the trial objectives have been achieved.

DIAGNOSTIC TRIALS: Refers to trials that are are conducted to find better tests or procedures for diagnosing a particular disease or condition. Diagnostic trials usually include people who have signs or symptoms of the disease or condition being studied.

DOSE-RANGING STUDY: A clinical trial in which two or more doses of an agent (such as a drug) are tested against each other to determine which dose works best and is least harmful.

DOUBLE-BLIND STUDY: A clinical trial design in which neither the participating individuals nor the study staff knows which participants are receiving the experimental drug and which are receiving a placebo (or another therapy). Double-blind trials are thought to produce objective results, since the expectations of the doctor and the participant about the experimental drug do not affect the outcome; also called double-masked study. See **Blinded Study**, **Single-Blind Study**, and **Placebo**.

DOUBLE-MASKED STUDY: See **Double-Blind Study.**

DRUG-DRUG INTERACTION: A modification of the effect of a drug when administered with another drug. The effect may be an increase or a decrease in the action of either substance, or it may be an adverse effect that is not normally associated with either drug.

DSMB: See **Data Safety and Monitoring Board**.

EFFICACY: (Of a drug or treatment). The maximum ability of a drug or treatment to produce a result regardless of dosage. A drug passes efficacy trials if it is effective at the dose tested and against the illness for which it is prescribed. In the procedure mandated by the FDA, Phase 2 clinical trials gauge efficacy, and Phase 3 trials confirm it (See **Food and Drug Administration (FDA)**, **Phase 2** and **3 Trials**).

ELIGIBILITY CRITERIA: Summary criteria for participant selection; includes Inclusion and Exclusion criteria. (See **Inclusion/Exclusion Criteria**)

EMPIRICAL: Based on experimental data, not on a theory.

ENDPOINT: Overall outcome that the protocol is designed to evaluate. Common endpoints are severe toxicity, disease progression, or death.

ENROLLING: The act of signing up participants into a study. Generally this process involves evaluating a participant with respect to the eligibility criteria of the study and going through the **informed consent** process.

EPIDEMIOLOGY: The branch of medical science that deals with the study of incidence and distribution and control of a disease in a population.

EXCLUSION/INCLUSION CRITERIA: See **Inclusion/Exclusion Criteria**.

EXPANDED ACCESS: Refers to any of the FDA procedures, such as compassionate use, parallel track, and treatment IND that distribute experimental drugs to participants who are failing on currently available treatments for their condition and also are unable to participate in ongoing clinical trials.

EXPERIMENTAL DRUG: A drug that is not FDA licensed for use in humans, or as a treatment for a particular condition (See **Off-Label Use**).

FDA: See **Food and Drug Administration**.

FOOD AND DRUG ADMINISTRATION (FDA): The U.S. Department of Health and Human Services agency responsible for ensuring the safety and effectiveness of all drugs, biologics, vaccines, and medical devices, including those used in the diagnosis, treatment, and prevention of HIV infection, AIDS, and AIDS-related opportunistic infections. The FDA also works with the blood banking industry to safeguard the nation's blood supply. Internet address: **http://www.fda.gov/**.

HYPOTHESIS: A supposition or assumption advanced as a basis for reasoning or argument, or as a guide to experimental investigation.

INCLUSION/EXCLUSION CRITERIA: The medical or social standards determining whether a person may or may not be allowed to enter a clinical trial. These criteria are based on such factors as age, gender, the type and stage of a disease, previous treatment history, and other medical conditions. It is important to note that inclusion and exclusion criteria are not used to reject people personally, but rather to identify appropriate participants and keep them safe.

IND: See **Investigational New Drug**.

INFORMED CONSENT: The process of learning the key facts about a clinical trial before deciding whether or not to participate. It is also a continuing process throughout the study to provide information for participants. To help someone decide whether or not to participate, the doctors and nurses involved in the trial explain the details of the study.

INFORMED CONSENT DOCUMENT: A document that describes the rights of the study participants, and includes details about the study, such as its purpose, duration, required procedures, and key contacts. Risks and potential benefits are explained in the informed consent document. The participant then decides whether or not to sign the document. Informed consent is not a contract, and the participant may withdraw from the trial at any time.

INSTITUTIONAL REVIEW BOARD (IRB): 1. A committee of physicians, statisticians, researchers, community advocates, and others that ensures that a clinical trial is ethical and that the rights of study participants are protected. All clinical trials in the U.S. must be approved by an IRB before they begin. 2. Every institution that conducts or supports biomedical or behavioral research involving human participants must, by federal regulation, have an IRB that initially approves and periodically reviews the research in order to protect the rights of human participants.

INTENT TO TREAT: Analysis of clinical trial results that includes all data from participants in the groups to which they were randomized (See **Randomization**) even if they never received the treatment.

INTERVENTION NAME: The generic name of the precise intervention being studied.

INTERVENTIONS: Primary interventions being studied: types of interventions are Drug, Gene Transfer, Vaccine, Behavior, Device, or Procedure.

INVESTIGATIONAL NEW DRUG: A new drug, antibiotic drug, or biological drug that is used in a clinical investigation. It also includes a biological product used *in vitro* for diagnostic purposes.

IRB: See **Institutional Review Board**.

MASKED: The knowledge of intervention assignment. See **Blind**

NATURAL HISTORY STUDY: Study of the natural development of something (such as an organism or a disease) over a period of time.

NEW DRUG APPLICATION (NDA): An application submitted by the manufacturer of a drug to the FDA – after clinical trials have been completed – for a license to market the drug for a specified indication.

OFF-LABEL USE: A drug prescribed for conditions other than those approved by the FDA.

OPEN-LABEL TRIAL: A clinical trial in which doctors and participants know which drug or vaccine is being administered.

ORPHAN DRUGS: An FDA category that refers to medications used to treat diseases and conditions that occur rarely. There is little financial incentive for the pharmaceutical industry to develop medications for these diseases or conditions. Orphan drug status, however, gives a manufacturer specific financial incentives to develop and provide such medications.

PEER REVIEW: Review of a clinical trial by experts chosen by the study sponsor. These experts review the trials for scientific merit, participant safety, and ethical considerations.

PHARMACOKINETICS: The processes (in a living organism) of absorption, distribution, metabolism, and excretion of a drug or vaccine.

PHASE 1 TRIALS: Initial studies to determine the metabolism and pharmacologic actions of drugs in humans, the side effects associated with increasing doses, and to gain early evidence of effectiveness; may include healthy participants and/or patients.

PHASE 2 TRIALS: Controlled clinical studies conducted to evaluate the effectiveness of the drug for a particular indication or indications in patients with the disease or condition under study and to determine the common short-term side effects and risks.

PHASE 3 TRIALS: Expanded controlled and uncontrolled trials after preliminary evidence suggesting effectiveness of the drug has been obtained, and are intended to gather additional information to evaluate the overall benefit-risk relationship of the drug and provide and adequate basis for physician labeling.

PHASE 4 TRIALS: Post-marketing studies to delineate additional information including the drug's risks, benefits, and optimal use.

PLACEBO: A placebo is an inactive pill, liquid, or powder that has no treatment value. In clinical trials, experimental treatments are often compared with placebos to assess the treatment's effectiveness. (See **Placebo Controlled Study**).

PLACEBO CONTROLLED STUDY: A method of investigation of drugs in which an inactive substance (the placebo) is given to one group of participants, while the drug being tested is given to another group. The results obtained in the two groups are then compared to see if the investigational treatment is more effective in treating the condition.

PLACEBO EFFECT: A physical or emotional change, occurring after a substance is taken or administered, that is not the result of any special property of the substance. The change may be beneficial, reflecting the expectations of the participant and, often, the expectations of the person giving the substance.

PRECLINICAL: Refers to the testing of experimental drugs in the test tube or in animals – the testing that occurs before trials in humans may be carried out.

PREVENTION TRIALS: Refers to trials to find better ways to prevent disease in people who have never had the disease or to prevent a disease from returning. These approaches may include medicines, vaccines, vitamins, minerals, or lifestyle changes.

PROTOCOL: A study plan on which all clinical trials are based. The plan is carefully designed to safeguard the health of the participants as well as answer specific research questions. A protocol describes what types of people may participate in the trial; the schedule of tests, proce-

dures, medications, and dosages; and the length of the study. While in a clinical trial, participants following a protocol are seen regularly by the research staff to monitor their health and to determine the safety and effectiveness of their treatment (See **Inclusion/Exclusion Criteria**).

QUALITY OF LIFE TRIALS (or Supportive Care trials): Refers to trials that explore ways to improve comfort and quality of life for individuals with a chronic illness.

RANDOMIZATION: A method based on chance by which study participants are assigned to a treatment group. Randomization minimizes the differences among groups by equally distributing people with particular characteristics among all the trial arms. The researchers do not know which treatment is better. From what is known at the time, any one of the treatments chosen could be of benefit to the participant (See **Arm**).

RANDOMIZED TRIAL: A study in which participants are randomly (i.e., by chance) assigned to one of two or more treatment arms of a clinical trial. Occasionally placebos are utilized. (See **Arm** and **Placebo**).

RECRUITING: The period during which a trial is attempting to identify and enroll participants. Recruitment activites can include advertising and other ways of solicting interest from possible particpants. (See **recruitment status** and **enrolling**).

RECRUITMENT STATUS: Indicates the current stage of a trial, whether it is planned, ongoing, or completed. Possible values include:

- Not yet recruiting: participants are not yet being recruited or enrolled
- Recruiting: participants are currently being recruited and enrolled
- Enrolling by invitation: participants are being (or will be) selected from a predetermined population
- Active, not recruiting: study is ongoing (i.e., patients are being treated or examined), but enrollment has completed
- Completed: the study has concluded normally; participants are no longer being examined or treated (i.e., last patient's last visit has occurred)
- Suspended: recruiting or enrolling participants has halted prematurely but potentially will resume
- Terminated: recruiting or enrolling participants has halted prematurely and will not resume; participants are no longer being examined or treated
- Withdrawn: study halted prematurely, prior to enrollment of first participant

RISK-BENEFIT RATIO: The risk to individual participants versus the potential benefits. The risk/benefit ratio may differ depending on the condition being treated.

SCREENING TRIALS: Refers to trials which test the best way to detect certain diseases or health conditions.

SIDE EFFECTS: Any undesired actions or effects of a drug or treatment. Negative or adverse effects may include headache, nausea, hair loss, skin irritation, or other physical problems. Experimental drugs must be evaluated for both immediate and long-term side effects (See **Adverse Reaction**).

SINGLE-BLIND STUDY: A study in which one party, either the investigator or participant, is unaware of what medication the participant is taking; also called single-masked study. (See **Blind** and **Double-Blind Study**).

SINGLE-MASKED STUDY: See **Single-Blind Study.**

STANDARD TREATMENT: A treatment currently in wide use and approved by the FDA, considered to be effective in the treatment of a specific disease or condition.

STANDARDS OF CARE: Treatment regimen or medical management based on state of the art participant care.

STATISTICAL SIGNIFICANCE: The probability that an event or difference occurred by chance alone. In clinical trials, the level of statistical significance depends on the number of participants studied and the observations made, as well as the magnitude of differences observed.

STUDY ENDPOINT: A primary or secondary outcome used to judge the effectiveness of a treatment.

STUDY TYPE: The primary investigative techniques used in an observational protocol; types are Purpose, Duration, Selection, and Timing.

SUSPENDED: See **Recruitment Status**

TERMINATED: See **Recruitment Status**

TOXICITY: An adverse effect produced by a drug that is detrimental to the participant's health. The level of toxicity associated with a drug will vary depending on the condition which the drug is used to treat.

TREATMENT IND: IND stands for Investigational New Drug application, which is part of the process to get approval from the FDA for marketing a new prescription drug in the U.S. It makes promising new drugs

available to desperately ill participants as early in the drug development process as possible. Treatment INDs are made available to participants before general marketing begins, typically during Phase 3 studies. To be considered for a treatment IND a participant cannot be eligible to be in the definitive clinical trial.

TREATMENT TRIALS: Refers to trials which test new treatments, new combinations of drugs, or new approaches to surgery or radiation therapy.

WITHDRAWN: See **Recruitment Status**

EVIDENCE-BASED MEDICINE IN THE SYSTEM TRAINING OF A DOCTOR. GOOD MEDICAL PRACTICE

Since the time of Hippocrates, the role of the doctor has extended beyond the narrow remit of curing patients of their ailments. Good medical practice, or the art of medicine, hinges on recognising and respecting the breadth of physical, cultural, spiritual, experiential and psychosocial characteristics of each patient, and understanding their impact on the patient's beliefs, attitudes and expectations. Doctors must deliver appropriate care which considers the technical complexities of modern treatment, and at the same time deals with the communication and interpersonal needs of the patient, at a time when he or she may feel most vulnerable. In addition to the diagnosis and treatment of illness, the scope of medicine has expanded to preventing disease through measures such as screening, vaccination and health promotion.

Doctors are centrally involved in tackling lifestyle-related issues of the modern world such as obesity, alcohol excess, cigarette smoking and sexual health.

Medical professionalism has been described by a Royal College of Physicians working party (2005) as 'a set of values, behaviours and relationships that underpin the trust the public has in doctors'. They stated that, in their day-to-day practice, doctors should be committed to integrity, compassion, altruism, continuous improvement, excellence, and working in partnership with members of the wider health-care team. They perceived that medical professionalism was relevant to leadership, education, career pathways, appraisal and research.

This chapter outlines how doctors must provide patients and their families with relevant but complex information, discuss management options, and reach appropriate clinical decisions that are commensurate with the available resources. It also describes pathways and processes to develop, maintain and assure medical professionalism.

THE DOCTOR-PATIENT RELATIONSHIP

The contents of this book are not all based on indisputable contemporary evidence; many reflect wisdom and understanding distilled over hundreds of years and passed from generation to generation of doctors. This perceived wisdom lies at the heart of the way that doctors and patients interact; it demands respect, and if the doctor also displays compassion, sets the scene for the development of trust.

Members and roles of a multidisciplinary team

Professional	Roles
Doctor	Diagnosis and treatment
	Overall coordination of care
Specialist nurse	Patient and family support
	Information-giving
Physiotherapist	Improving physical function
	Physical rehabilitation
Occupational therapist	Maximising skills and abilities
	Complex re-enablement
Speech and language therapist	Optimising communication
	Swallowing assessment
Dietitian	Nutritional advice
	Parenteral feeding support
Pharmacist	Safe prescribing
	Complex medicines delivery
Social worker	Coordination of home care
	Financial advice
Clinical psychologist	Cognitive interventions
	Psychological support
Pastoral care	Psychological support
	Spiritual support

The duties of a doctor registered with the UK General Medical Council.

Patients must be able to trust doctors with their lives and health. To justify that trust you must show respect for human life and you must:

1. Make the care of your patient your first concern,
2. Protect and promote the health of patients and the public,
3. Provide a good standard of practice and care,
4. Keep your professional knowledge and skills up to date,
5. Recognise and work within the limits of your competence,
6. Work with colleagues in the ways that best serve patients' interests,
7. Treat patients as individuals and respect their dignity,
8. Treat patients politely and considerately,
9. Respect patients' right to confidentiality,
10. Work in partnership with patients,
11. Listen to patients and respond to their concerns and preferences,
12. Give patients the information they want or need in a way they can understand,
13. Respect patient's right to reach decisions with you about their treatment and care,
14. Support patients in caring for themselves to improve and maintain their health,
15. Be honest and open, and act with integrity,
16. Act without delay if you have good reason to believe that you or a colleague may be putting patients at risk,
17. Never discriminate unfairly against patients or colleagues,
18. Never abuse your patients' trust in you or the public's trust in the profession.

You are personally accountable for your professional practice and must always be prepared to justify your decisions and actions.

Due to the complexities of many chronic diseases and treatments, and the multifaceted impact of illness on a patient, there is an increasing role for health care to be delivered by a multidisciplinary team. This model of care recognises the different skills of each allied health professional and focuses patient care beyond surgical procedures or pharmacological manipulation. The doctor usually takes the lead in determining the overall direction of care but must also:

• guide the patient through the unfamiliar landscape, language and customs of clinical care

• interpret, synthesise and convey complex information
• help patients and families to participate fully in thinking about their care and in the decision-making process.

In many clinical disciplines, doctors from several specialties form a multidisciplinary team in order to formulate a treatment plan. In oncology, for example, this ensures that various modalities of treatment (surgical, oncological and palliative) are considered.

The doctor-patient relationship is in itself therapeutic; a successful consultation with a trusted and respected practitioner will therefore have beneficial effects irrespective of any other therapy given. The doctor-patient relationship is also multilayered, dynamic and bilateral. Figure 1.1 illustrates how it may be influenced by differences in attitudes or beliefs, and behaviours or roles.

Regulatory bodies such as the UK General Medical Council seek to define the medical side of the doctor-patient relationship in terms of the duties of a doctor. It is common for medical schools to require undergraduate students to sign an ethical code of conduct based on statements like this.

CLINICAL AND COMMUNICATION SKILLS

Communication lies at the heart of good medical practice. The most technically capable clinician will fail in the duty of care if he or she is unable to communicate effectively with patients or relatives, since this is essential for accurate history-taking, information-giving and decision-making. Likewise, the delivery of holistic care requires effective communication with other doctors and members of the multidisciplinary team, failure of which may lead to clinical errors. Clear and appropriately detailed clinical note-keeping is essential, as are timely and accurate written communications between professionals.

Some barriers to good communication in health care

The clinician:

Authoritarian or dismissive attitude

Hurried approach

Use of jargon
Inability to speak first language of patient
No experience of patient's cultural background

The patient:
- Anxiety
- Reluctance to discuss sensitive or seemingly trivial issues
- Misconceptions
- Conflicting sources of information
- Cognitive impairment

Hearing/speech/visual impediment

Failures in communication may also lead to poor health outcomes, strained working relations, widespread dissatisfaction among patients, their families and health professionals, anger and litigation. The majority of complaints received by health-care professionals could have been avoided by effective communication. Some common barriers to good communication are listed in Box 1.3.

The development of communication skills to facilitate accurate history-taking and information-giving takes many years and requires frequent opportunities for personal reflection on previous consultations. A detailed account of history-taking, clinical examination and communication skills is beyond the scope of this chapter but is provided in Davidson's sister title, *MacLeod's Clinical Examination*. However, some basic communication principles are discussed below and these can be applied to most consultations.

Communication skills in the medical interview:

- **Open questions** allow patients to express their own thoughts and feelings, e.g. 'How have you been since we last saw you?', 'Is there anything else that you want to mention?'
- **Closed questions** are requests for factual information, e.g. 'When did this pain start?'
- **Leading questions** invite specific responses and suggest options, e.g. 'You'll be glad when this treatment is over, won't you?'
- **Reflecting questions** help to develop or expand topics, e.g. 'Can you tell me more about your family?'

• **Active listening** encourages further dialogue, e.g. 'Go on,' 'I see,' 'Hmm' etc.

• **Requesting clarification** encourages further detail, e.g. 'How do mean?', 'In what way?' etc.

Summarising ensures accurate understanding, e.g. 'Tell me if I've got this right.'

The main aim of a medical interview is to establish a factual account of the patient's illness. The clinician must allow the patient to describe the problems without overbearing questioning, but should try to facilitate the process with appropriate questions. Techniques such as an unhurried approach, checking prior understanding, making it clear that the interviewer is listening, the use of silence when appropriate, recapping on what has been said, and reflection of key points back to the patient are all important. A major requirement is to express complex information and concepts in language with which the patient can readily engage. Non-verbal communication is equally important. The patient's facial expressions and body language may betray hidden fears. The clinician can help the patient to talk more freely by smiling or nodding appropriately.

Beyond the factual account of symptoms, the clinician should also explore patients' feelings, determine how they interpret their symptoms, unearth their concerns and fears, and explore their expectations before suggesting and agreeing a plan of management. Clinicians should demonstrate understanding, sensitivity and empathy (i.e. imagine themselves in the patient's position). Most patients have more than one concern and will be reluctant to discuss potentially important issues if they feel that the clinician is not interested or is likely to dismiss their complaints as irrational or trivial.

Specific communication scenarios such as breaking bad news or dealing with aggression require additional targeted strategies (see *MacLeod's Clinical Examination*).

USING INVESTIGATIONS

Modern medical practice has become dominated by sophisticated and often expensive investigations. It is easy to forget that the judicious use of these tools, and the interpretation of the data that they provide, are crucially dependent on good basic clinical skills. Indeed, a test should only be ordered if it is clear that the result will influence the patient's management and the perceived value of the resulting information exceeds the anticipated discomfort, risk and cost of the procedure. Clinicians should therefore analyse their patient's condition carefully and draw up a provisional management plan before requesting any investigations.

The 'normal' (or reference) range.

Although some tests provide qualitative results (present or absent, e.g. faecal occult blood testing), most provide quantitative results (i.e. a value on a continuous numeric scale). In order to classify quantitative results as normal or abnormal, it is necessary to define a 'normal range'. Many quantitative measurements in populations exhibit a bell-shaped, or Gaussian, frequency distribution (Fig. 1.2); this is called a 'normal distribution' and is characteristic of biological variables determined by a complex mixture of genetic and environmental factors (e.g. height) and of test results (e.g. plasma sodium concentration). A normal distribution can be described by the mean value (which places the centre of the bell-shaped curve on the x axis) and the standard deviation (SD, which describes the width of the bell-shaped curve). Within each SD away from the mean there is a fixed percentage of the population. By convention, the 'normal range' is usually defined as those values which encompass 95% of the population, i.e. the values within 2 SDs above and below the mean. If this convention is used, however, 2.5% of the normal population will have values above, and 2.5% will have values below, the normal range; for this reason, it is more precise to describe 'reference' rather than 'normal' ranges.

For many tests, the frequency distribution of results in the normal healthy population (red line) is a symmetrical bell-shaped curve. The mean ± 2 standard deviations (SD) encompasses 95% of the normal population and usually defines the 'normal range' (or 'reference range'); 2.5% of the normal population have values above, and 2.5% below, the reference range (shaded areas). For some diseases (blue line), test results

overlap with the normal population or even with the reference range. For other diseases (green line), tests may be more reliable because there is no overlap between the normal and abnormal population.

Abnormal' results, i.e. those lying beyond 2 SDs from the mean, may occur either because the person is one of the 2.5% of the normal population whose test result is outside the reference range, or because he or she has a disease characterised by a different result from the test. Test results in 'abnormal' populations also have a bell-shaped distribution with a different mean and SD. In some diseases, there is typically no overlap between results from the normal and abnormal population (e.g. elevated serum creatinine in renal failure). In many diseases, however, there is overlap, sometimes extending into the reference range (e.g. elevated serum thyroxine in toxic multinodular goitre). In these circumstances, the greater the difference between the test result and the limits of the reference range, the higher the chance that the person has a disease, but there is a risk that results within the reference range may be 'false negatives' and results outside the reference range may be 'false positives'.

Each time a test is performed in a member of the normal population there is a 5% (1 in 20) chance that the result will be outside the reference range. If two tests are performed, the chance that one of them will be 'abnormal' is 10% (2 in 20), and so on; the chance of detecting an 'abnormal' result increases as more tests are performed, so multiple indiscriminate testing should be avoided.

In practice, reference ranges are usually established by performing the test in a number of healthy volunteers who are assumed to be a random sample of the normal population. Not all populations are the same, however, and while it is common to have different reference ranges for tests in men and women, or in children and adults, clinicians need to be aware that reference ranges defined either by test manufacturers or even within the local laboratory may have been established in small numbers of healthy young people who are not necessarily representative of their patient population. This is another reason to recognise that reference ranges do not discriminate perfectly between health and disease.

For some tests, the clinical decision does not depend on whether or not the patient is a member of the normal population. This commonly applies to quantitative risk factors for future disease. For example, higher plasma

total cholesterol levels are associated with a higher risk of future myocardial infarction within the normal population. Although a reference range for cholesterol can be calculated, cholesterol-lowering therapy is commonly recommended for people with values within the reference range; the 'cutoff' value at which therapy is recommended depends upon the presence of other risk factors for cardiovascular disease. The reference range for plasma cholesterol is therefore redundant and the phrase 'normal plasma cholesterol level' is unhelpful. Similar arguments apply for interpretation of values of blood pressure, blood glucose, bone mineral density and so on.

Some quantitative test results are not normally distributed, usually because a substantial proportion of the normal population will have an unrecordably low result (e.g. serum prostate-specific antigen and serum troponin), and the distribution cannot be described by mean and SDs. Alternative statistical procedures can be used to calculate 95th centiles, but it is common in these circumstances to use information from normal and abnormal people to identify 'cutoff' values which are associated with a certain risk of disease, as described below.

SENSITIVITY AND SPECIFICITY

Many tests are potentially hazardous and none is completely reliable. All diagnostic tests can produce false positives (an abnormal result in the absence of disease) and false negatives (a normal result in a patient with disease). The diagnostic accuracy of a test can be expressed in terms of its sensitivity and its specificity.

Sensitivity is defined as the percentage of the test population who are affected by the index condition and test positive for it. In contrast, specificity is defined as the percentage of the test population who are healthy and test negative. A very sensitive test will detect most disease but may generate abnormal findings in healthy people. A negative result will therefore reliably exclude disease but a positive test is likely to require further evaluation. On the other hand, a very specific test may miss significant pathology but is likely to establish the diagnosis, beyond doubt, when the result is positive.

The accuracy of diagnostic tests

	Affected	**Unaffected**
Positive test	True +ve (a)	False +ve (b)
Negative test	False -ve (c)	True -ve (d)

Sensitivity (%) = [a/(a + c)] × 100

Specificity (%) = [d/(b + d)] × 100

Positive predictive value = a/(a + b)

Negative predictive value = d/(c + d)

Likelihood ratio: positive test = sensitivity/(1 – specificity) negative test = (1 – sensitivity)/specificity

The curve is generated by 'adjusting' the cutoff values defining normal and abnormal results, calculating the effect on sensitivity and specificity, then plotting these against each other. The closer the curve lies to the top left-hand corner, the more useful the test. The red line illustrates a test with useful discriminant value and the green line illustrates a less useful poorly discriminant test.

In choosing how a test is used to guide decision-making there is an inevitable trade-off between emphasising sensitivity as opposed to specificity. For example, defining an exercise electrocardiogram as abnormal if there is ≥ 0.5 mm ST depression will ensure that very few cases of coronary artery disease are missed but will generate a lot of false positive tests (high sensitivity, low specificity). On the other hand, using a cutoff point of ≥ 2.0 mm ST depression will detect most cases of important coronary disease with far fewer false positive results. This trade-off can be illustrated by the receiver operating characteristic curve of the test

Predictive value.

The predictive value of a test is determined by its sensitivity and

specificity, and can be expressed in several ways. The positive predictive value is the probability that a patient with a positive test has the index condition, whilst the negative predictive value is the probability that a patient with a negative test does not have the condition (see Box 1.5). The likelihood ratio expresses the odds that a given finding would occur in a patient with, as opposed to a patient without, the index condition (as the odds rise above 1 the probability that disease is present rises).

The interpretation, and therefore the utility, of a test are critically dependent on the circumstances in which it is used. Bayes' theorem dictates that the value of a diagnostic test is determined by the prevalence of the condition in the test population. The probability that a subject has a particular condition (the post-test probability) can be calculated if the pre-test probability and the sensitivity and specificity of the test are known. Thus, a test is most valuable when there is an intermediate pre-test probability of disease. Clinicians seldom have access to such precise information but must appreciate the importance of integrating clinical and laboratory data.

Factors that influence the cost-effectiveness of health screening

- The prevalence of the index condition in the target population
- The cost of the screening test
- The sensitivity and specificity of the screening test
- The availability and effectiveness of treatment for the index condition
- The cost of not detecting and treating the condition

Many health-care systems run screening programmes to detect important (and treatable) disease in apparently healthy but at-risk individuals. These initiatives may be directed towards a single pathology (e.g. mammography for breast cancer, p. 274) or may comprise a battery of tests for a wide range of conditions. Screening inevitably generates a number of false-positive results that require further, potentially expensive and sometimes risky, investigation. This may engender a good deal of anxiety for the patient and create dilemmas for the clinician; for example, it may be difficult to determine how to evaluate minor abnormalities of the liver function tests in an otherwise healthy person

Medical management decisions are usually made by weighing up the anticipated benefits of a particular procedure or treatment against the po-

tential risks. To allow patients to contribute to the decision-making process, health professionals must be able to explain risk in an accurate and understandable way.

Providing the relevant biomedical facts is seldom sufficient to guide decision-making because a patient's perception of risk is often coloured by emotional, and sometimes irrational, factors. Most patients will have access to information from a wide variety of sometimes conflicting sources, including the Internet, books, magazines, self-help groups, other health-care professionals, friends and family. The clinician must be aware of and sensitive to the way in which these resources influence the individual, while building trust with the patient, clarifying the problem and conveying the key facts.

Explaining the risks and benefits of therapy:

- it reduced your risk of having a stroke by 47%?
- it reduced your chance of suffering a stroke from 0.26% to 0.14%?
- there was one chance in 850 that it would prevent you having a stroke?
- 849 out of 850 patients derived no benefit from the treatment?

There was a 99.7% chance that you would not have a stroke anyway?

Research evidence provides statistics and probabilities, but these can be confusing and can be presented in many ways (Box 1.8). Relative risk describes the proportional increase in risk; it is a useful measure of the size of an effect. In contrast, absolute risk describes the actual chance of an event and is what matters to most patients. Terms such as 'common', 'rare', 'probable' and 'unlikely' are elastic. Whenever possible, the clinician should quote numerical information using consistent denominators (e.g. '90 of every 100 patients who have this operation feel much better, 1 will die during the operation and 2 will suffer a stroke'). Positive framing ('There is a 99% chance of survival') and negative framing ('There is a 1% chance of death') may both be appropriate. A variety of visual aids can be used to present complex statistical information in a digestible way

Finally, it is essential to allow the patient to place his or her own weighting on the potential benefits and adverse effects of each course of

action. Thus, some patients may choose to sacrifice a good chance of pain relief because they are not prepared to run even a small risk of paralysis, whilst others may opt to proceed with very high-risk spinal surgery because they find their current circumstances intolerable.

CLINICAL DECISION-MAKING

Assimilating symptoms, signs and results of investigations into a diagnosis and then planning treatment are highly complex tasks that require not only factual knowledge but also a highly developed set of skills in decision-making. Diagnostic decision-making is guided by Ockham's razor, originally expressed by the 14th-century Englishman William of Ockham as 'plurality should not be posited without necessity.' In short, all things being equal, the simplest explanation is the best. In practice, clinicians formulate hypotheses about the underlying diagnosis (or shortlist of diagnoses, the 'differential' diagnosis) during the consultation with the patient and refine this hypothesis both by collecting selected additional information and by choosing to ignore other information which they regard as irrelevant, in order to reach the most parsimonious diagnosis.

Decision-making in health care often operates under conditions of uncertainty, where it is uncertain what is wrong with the patient or which treatment is most appropriate. This can lead to variations in how clinicians make decisions, and subsequently variations in the care that patients receive. Clinicians often employ a process of 'ad hoc' decision-making, where they use some form of global judgement about what might be the best course of action for an individual patient. These ad hoc decisions may be based on a number of factors, including what a clinician has been taught, his or her clinical experience of other patients with that particular disease, or what is common practice within a particular institution. However, such decisions may be governed by heuristics or bias, which may lead to errors. Heuristics are cognitive processes or 'rules of thumb' used unconsciously when making decisions. Such processes may lead to mistakes, most commonly when there is a lack of evidence to inform practice. Whenever possible, clinical decision-making should be guided by evidence-based medicine.

Heuristics in clinical decision-making

• The probability of an event is estimated based on how easily an individual can recall a similar event from his or her memory

• E.g. a doctor judges that a patient has a particular disease because the case reminds him or her of a similar case seen recently

This can lead to errors, as individuals often recall recent or vivid events more easily, rather than considering the actual likelihood of an event in the wider population

Representativeness

• The probability of an event is estimated based on how similar (or representative) it is of a wider category of events

• E.g. a doctor judges that a patient has a particular disease because the patient's signs and symptoms are 'representative' of that disease

This can lead to errors such as neglecting to take into account the prevalence of the disease in a specific patient population

Anchoring and adjustment

• The probability of an event is estimated by taking an initial reference point (anchor) and then adjusting this to reach a final judgement about likelihood

• E.g. a doctor judges that the likelihood of a patient having a particular disease is 60%. The doctor collects information (perhaps from diagnostic tests) and reassesses his or her estimation on the basis of these results to reach a final diagnosis

This can lead to errors, as final estimations of likelihood are linked to the original anchor, so if this is incorrect, the final judgement is also likely to be inaccurate.

Patient treatment should be based on the integration of best research evidence alongside clinical expertise and patient values. The discipline of evidence-based medicine (EBM) came into being in order to introduce a more systematic approach to the use of evidence in making clinical decisions. This was made possible by:

• the development of statistical methods to analyse data systematically

• recognition of the importance of analysing all data, both published and unpublished

The development of databases of relevant information and systems by which to access such information.

The principles of EBM are based on the tenet that well-formulated questions about medical management can be answered by:

- conducting high-quality randomised controlled trials
- tracing all the available evidence
- critically appraising the evidence
- applying the evidence to the management of the individual patient.

EBM categorises different types of clinical evidence and ranks them according to their freedom from the various biases that beset medical research. It therefore places greater emphasis on evidence from a meta-analysis of randomised controlled trials than on a series of case reports or expert opinion.

Protocols.

Whilst guidelines recognise the individuality of the patient and help clinicians decide on which action is best, protocols are far more directive and are written to be followed exactly. Protocols usually apply in situations where the clinical decision has already been made and the treatment or intervention is then being instigated. Protocols aim to ensure that treatment will be identical irrespective of where and by whom it is given. For example, a guideline may help a multidisciplinary team decide which modality of treatment is best for someone with lung cancer; it will allow the team to evaluate the best evidence alongside the individual psychosocial needs of the patient. However, once a decision has been made in favour of a certain treatment, e.g. chemotherapy, the clinician will be expected to follow a strict protocol outlining dosages, routes of administration, monitoring and so on to ensure parity of treatment wherever the chemotherapy is given.

Cost-effectiveness.

The best available health care can be expensive. No country can now afford to provide unlimited state-of-the-art medicine for all its citizens. Health-care systems must therefore take account of the cost-effectiveness of the treatments they provide. This can create difficult dilemmas for clinicians who may be asked to withhold expensive but effective therapies (e.g. implantable defibrillators) from individual patients on the basis that the money will do more good for more patients if it is spent elsewhere (e.g. offering angioplasty to all acute myocardial infarction patients). Assessing the cost-effectiveness of interventions and allocating resources

accordingly follows ethical principles such as justice, which are covered in greater detail below. One way to assess the cost-effectiveness of an intervention is to calculate the number of quality-adjusted life years that an intervention will provide for a patient.

Quality-adjusted life years.

Outcomes from health care can be measured in terms of changes in the quality and quantity of life. Life expectancy is easily defined but quality of life is difficult to measure. Nevertheless, it is possible to construct a continuum between perfect health (score 1), survival with no quality of life (score 0) and states that are perceived to be worse than death (minus score). Quality and quantity of life can then be combined in a measure known as the quality-adjusted life year (QALY). For example, an intervention that results in a patient living an additional 4 years with an average quality of life rated as 0.6 on the continuum would yield 2.4 QALYs (4×0.6). Thus a cost per QALY can be calculated and compared with other interventions. This sort of approach has many failings but, for the time being at least, offers the best means of comparing the cost-effectiveness of a wide range of treatments.

Practising medicine in low-resource settings.

The problems associated with medical care in low-resource areas cluster in four domains:

• *Prevention versus cure*. Prevention is easier, cheaper and more effective than cure for many diseases. On the other hand, curative medicine is immediate, highly visible and glamorous. This tension is most evident when a disease is common and the benefits of prevention have yet to be realised. The allocation of adequate resources for long-term prevention needs both political will and social acceptance.

• *Acute versus chronic care*. Acute medical care produces immediate and often gratifying results whilst treating chronic illness can be time-consuming and less rewarding. Facilities for chronic care are therefore accorded a low priority in many health-care systems. Unfortunately, this often results in patients who require long-term care being denied treatment altogether or being managed inappropriately (at high cost) in the acute sector.

• *The ideal versus the possible*. Most medical management guidelines are derived from studies that were conducted in well-resourced health-

care systems. In trying to apply this knowledge to the developing world, there are tensions between best practice and what is possible. For example, anticoagulant therapy may pose risks that were not evident in the studies that underpin guidelines if it is prescribed in areas where reliable laboratories are not available and medications that interact with warfarin are commonly purchased 'over the counter'.

Channels of health-care provision. In developing countries health care may be delivered through government-run public clinics (usually free or subsidised services) or non-governmental organisations (sometimes subsidised but usually privately funded services). Many of the available services are too costly for the average patient, so for the benefit of the community as a whole there is a need for constructive cooperation between all of the health-care sectors.

The best possible practice is that which can be delivered within the available resources in a specific setting. Compassionate care given with empathy, understanding and good communication is always within the physician's reach, even when physical resources are inadequate.

MEDICAL ETHICS

Ethics is the 'science' of morality. Medical ethics is concerned both with the standards of conduct and competence expected of members of the medical profession, and with the study of ethical problems raised by the practice of medicine. Recent advances in biomedical science and their application to clinical care have thrown up many difficult ethical problems. These include human cloning, predictive genetic testing, eugenics, women's health, new reproductive technologies, antenatal screening, abortion, priority-setting, global medicine, underserved populations, brain death, organ transplantation, end-of-life issues, assisted suicide and advance directives. Detailed discussion of these is beyond the scope of this chapter but a framework for the application of ethics to medical practice will be described.

In general, ethical problems relate to the intentions or motives of those involved, their actions, the consequences of their actions, and the context in which their actions take place. Ethical problems can be analysed in a

variety of ways, and different analytical approaches may lead to different conclusions. To find the best solution, it may be necessary to apply several different analytical approaches and attempt to reconcile the conclusions. In modern medical practice there is not always time to do this systematically. However, the process of applying an ethical framework to a given situation is a key element in clinical decision-making and helps to ensure that a decision is both morally acceptable and legally defensible.

• *Virtue ethics* is concerned with the character of the persons involved and with their actions. Are my intentions (what my actions aim at) and my motives (what moves me to act) good or bad, wise or unwise, sensible or unrealistic, patient-centred or self-centred, and so on? Is the course of action I propose to take one which would be considered appropriate by a prudent doctor-or by a prudent patient? The focus here is on the characteristics of a virtuous person. Right action flows from the nature of that person.

• *Deontological ethics* is concerned with whether a proposed action or course of action, in itself and regardless of its consequences, is right or wrong. Is it ever right or always wrong to kill, to tell a lie, to break a promise? Deontological (from the Greek for 'duty') considerations include rights as well as duties, and omissions as well as acts. An action is right if it is in accordance with an established moral rule or principle.

• *Teleological ethics* (or consequentialism) is concerned with the consequences of a proposed action or course of action. Are they likely to be good or bad, in the short term and long term, for the patient, doctor, family and society? What will promote a net balance of good over harm for the individual as well as 'the greatest good for the greatest number'? Who decides (or can predict) what is the 'best' outcome?

An ethical problem can therefore be addressed by trying to decide what a virtuous person would do, whether an action or course of action is right or wrong in itself, or what its consequences might be. Yet the circumstances in which any decision is made will vary, and what may be right in one context may be wrong in another. *Situation ethics* recognises this, emphasising the need to consider carefully the context (or situation) in which a course of action is chosen.

Ethics are applied to the practice of medicine in three broad areas:

• *Clinical ethics* deal with the relationship between clinicians and individual patients, as described below.

• *Public health ethics* deal with the health issues of groups of people-the community. Examples include the banning of smoking in public places, where the autonomy of the individual may be coerced for the greater good of the community.

• *Research ethics* deal with issues related to clinical research. This is to ensure not only that research is conducted safely but also that the rights of the participants are paramount. No research can be undertaken unless it has undergone ethical scrutiny.

Key principles of clinical ethics

In clinical ethics, four key principles are frequently used to underpin the analysis of a problem, and are often abbreviated to 'autonomy, beneficence, non-maleficence and justice.

Respect for persons and their autonomy.

This respect is a significant aspect of the relationship between patient and doctor. The patient seeks out a doctor based on a desire to attain freedom from a disability or disease which limits his or her ability to exercise autonomy (the power or right of self-determination). Unless the patient is a child, is unconscious or is mentally incapacitated, it is the patient's choice to seek advice. The physician must therefore respect the patient's autonomy. This includes the patient's right to refuse therapy. The doctor must also actively seek to empower the patient with adequate information.

Respect for persons and their autonomy has important implications for truth-telling, informed consent and confidentiality.

Truth-telling.

Telling the truth is essential to generating and maintaining trust between the doctor and the patient. This includes providing information about the nature of the illness, expected outcome and therapeutic alternatives, and answering questions honestly. The facts should not be given 'brutally' but with due sensitivity to appropriate timing and to the patient's capacity to cope with bad news. However, the clinical uncertainties described earlier in the chapter must also be acknowledged. There are two rare situations where the truth may, at least for a time, be withheld:

• If it will cause real harm to the patient (e.g. a depressed patient likely to commit suicide who has to be told that he or she has cancer). This is sometimes called 'therapeutic privilege', since it should be exercised only in the patient's vital interests and for very serious clinical reasons.

• If the patient makes it clear that he or she does not want to hear the bad news (but always bearing in mind that this may be a stage in the patient's adjustment to the condition).

In no case should false information be given, and the physician should always be prepared to justify any decision to withhold relevant information.

Informed consent.

This term describes the participation of patients in decisions about their health care. In order to facilitate this, the clinician must provide the patient with an adequate explanation of the nature of the decision, and details of the relevant risks, benefits and uncertainties of each possible course of action. The amount of information to provide will vary, depending on the patient's condition and the complexity of the treatment, and on the physician's assessment of the patient's understanding of the situation. Not all options need be explained, but those that a 'prudent patient' would consider significant should be explored-for example, by open questioning.

From both a legal and an ethical perspective the patient retains the right to decide what is in his or her best interests. All adults have decision-making capacity if they can understand the relevant information (which may have to be explained in simple terms), consider the implications of the relevant options, and make a communicable decision. If a patient makes choices that seem irrational or are at variance with professional advice, it does not mean that they lack capacity.

When the patient does lack decision-making capacity, the clinician should always act in the best interests of the patient. In an emergency, consent may be presumed, but only for treatment immediately necessary to preserve the patient's life and health, and if there is no clear evidence that this would be against the previous settled wishes of the patient when competent (for example, blood transfusion in the case of an adult Jehovah's Witness). If the patient has a legally entitled surrogate decision-maker, the consent of the latter should be sought wherever possible. It is also good practice to involve close relatives in decision-making but the hierarchy of surrogate decision-makers will depend on local laws and culture.

Confidentiality.

Confidentiality in relation to the appropriate management of patient-specific information is important in generating and maintaining trust in the doctor-patient relationship. Health-care teams must take precautions to prevent unauthorised access to patient records, and may disclose patient-identifying information only when the patient has given consent or when required by law. Where such information is shared with other health-care professionals in order to optimise individual patient care, this should be done on a strictly 'need-to-know' basis.

Beneficence.

This is the principle of doing good, or acting in another person's best interests. In clinical ethics, the term refers to the good of the individual patient. It means considering the patient's view of his or her own best interests as well as his or her medical best interests. Situations may arise where there is a conflict between what is good for the individual and what is best for society, but the traditional medical approach is that stated in the Declaration of Geneva (World Medical Association): 'The health of my patient will be my first consideration.'

Non-maleficence.

This is the principle of doing no harm: in medicine, the traditional 'primum non nocere'. In balancing beneficence and non-maleficence (benefit versus risk), the clinician must share the relevant information with the patient, who can then be helped to make an informed decision.

Justice.

In the context of clinical ethics, justice relates primarily to the distribution of medical care and the allocation of resources. In order to distribute health resources justly, the concept of utility-'greatest good for the greatest number'-must be considered. In the case of individual patients, however, justice is also equated with being 'fair' and 'even-handed'. The concept of fair delivery of health care can be viewed from three perspectives:

- Respect for the *needs* of the individual. Health care is delivered first to those who need it most. This perspective is particularly relevant when need must be assessed by some kind of triage.
- Respect for the *rights* of a person. Everyone who needs health care is entitled to a fair share of the resources available. This perspec-

tive is particularly relevant when local or global economic, social, educational or other inequalities prevent or reduce equitable access to health care.

- Respect for *merit*. Health care is delivered on the basis of value judgements, according to financial, political, social or other factors relating to the value of the individual to society. For example, the President of the USA is cared for by an in-house personal physician and the White House Medical Unit. The relevance of this perspective to health care is widely disputed, not least because such value judgments are difficult to make in practice and to defend ethically.

Types of ethical problems.

When faced with an ethical problem, it is often helpful to characterise it in terms of certain patterns which can be recognized.

The ideal goal is clearly seen but there are major obstacles to achieving it. The obstacles may be economic or social, or in the belief system of the patient. The obvious answer-to bridge the gap or remove the block-may not be possible within the available time frame and resources. A young boy from a poor family in a developing country, who has Wilson's disease and needs a liver transplant, is an example of an economic block. Some problems of this kind cannot be resolved satisfactorily in the clinical context until or unless they are resolved in the economic or political context.

Priority-setting.

The right course of action is clear but prioritisation is necessary and the principles to guide that process have to be defined. A decision to allot the last bed in intensive care to either an 80-year-old patient with pneumonia or a 20-year-old with advanced lymphoma is an example. While it is not possible to cover all eventualities, guidelines agreed in advance with relevant stakeholders are often helpful.

A moral dilemma.

Acting in accordance with one ethical principle may conflict with another ethical principle. This can create a moral dilemma-a choice between two alternatives, neither of which is ethically satisfactory. For example, a physician may decide that a particular mode of therapy is best (principle of beneficence) while the patient makes a different choice (principle of respect for autonomy). In theory, the dilemma can be resolved only if

one of the ethical principles is given priority; ethical analysis (see below) can help to achieve resolution. True moral dilemmas are less common in practice than in theory; apparent dilemmas can often be resolved by good doctor-patient communication.

Resolving conflict.

A conflict of opinion may arise between members of the team responsible for care of the patient. Differing views should normally be resolved through discussion, but if this does not work, decision-making authority allocated in advance may have to be invoked. The challenge then is to ensure consistent and accurate implementation of the decision.

Ethical analysis.

Ethical analysis (or moral reasoning) is the process of thinking through ethical problems and reaching a conclusion. It helps the decision-maker to grow personally and professionally, allows communication of the process by which a decision is made, and permits the process to be constructively criticised. It can be used systematically: for example, in retrospective review of difficult cases. When, in everyday practice, time for reflection is limited, knowledge of methods of moral reasoning provides a useful background and aid for decision-making, and is often employed in ways analogous to those of 'the novice-expert shift'. Some approaches that can be applied are as follows:

• *principles approach*. This involves analysing an ethical problem in terms of the principles of respect for autonomy, beneficence, non-maleficence and justice. If all of these principles support a particular course of action, then that course of action is probably correct and there may in fact no longer be an ethical problem. If, however, different principles suggest different courses of action, this approach has no intrinsic mechanism for deciding which principle has priority. On the other hand, analysing the problem in terms of these principles can help to clarify the nature of the ethical problem and the issues which need to be addressed if the problem is to be resolved.

• *A casuistry (cases) approach*. This uses precedent as a guide to what to do. A case is recalled or imagined which is similar to that under discussion but where the right choice of action/behaviour was obvious. Then the features which make the present case different, if any, are analysed and considered to see if and why they lead to a different conclusion. A varia-

tion on this approach, related to virtue ethics, is to imagine what a physician who was particularly skilled or experienced in this type of situation would do, or how a previous patient might have viewed the problem.

• *A perspectives (or narrative) approach*. A perspectives approach involves considering the views of all the stakeholders: the patient, the family or carers, the health-care team, the health service and society. The greater the degree of concordance of these views on a particular outcome, the more likely it is that the decision leading to that outcome is right. A narrative approach is similar to this but involves listening attentively to the different 'stories' told by the stakeholders about the problem and how they perceive it in their own experience. Where these stories differ can provide clues to a more nuanced understanding of the problem and how, if possible, it might be resolved.

• *A counter-argument approach*. A particular course of action is chosen and the best ethical arguments against it are then marshalled and evaluated. This may or may not cause the decision to be reconsidered.

• *Application of rules*. In certain common and clearly defined situations, externally imposed rules (including the law) may require, or guide towards, a specific course of action. This does not obviate the need for ethical analysis. Moreover, any such rules must be reviewed regularly.

While all of these approaches may be useful, it is important to remember that none of them removes the need on the one hand for the exercise of judgement, and on the other for good communication and consensus decision-making. No less important is the requirement for all of this to be based on sound and shared information about the clinical and human facts of the case. In this respect a useful, integrated way of addressing ethical problems is provided by what has been called:

An onion-peel approach. This uses a layered framework to analyse the problem systematically.

Discussion with colleagues and others is crucial in reaching ethical decisions. Many hospitals have a clinical ethics committee to review difficult decisions. Up-to-date, accurate, valid and reliable data should inform the decision-making progress. Local legal issues must be considered. Once a conclusion has been reached, a strategy to complete the action must be implemented. Post-hoc evaluation of decisions is important, and again is best carried out collectively by an ethics committee or some other means of retrospective review.

A clinical ethics scenario:

Ethical analysis: an 'onion-peel' approach.

Patient preferences: data gathered from patient and relatives

- What is the quality of life expected after therapy-from the patient's perspective?
- If the patient is competent, has he or she been offered options and made choices?
- If the patient is not competent, who will make the decisions?

Medical goals: data gathered from literature, guidelines, expert opinion

- What are the prospects of a successful outcome?
- What are the best therapeutic options available based on evidence?
- Has the therapy been optimised and matched to this individual patient?

Regional issues: data gathered from local sources

- What decisions are most consistent with local laws and with social and cultural values?

Basic ethical principles, type of ethical problem, ethical analysis (see text)

- Consider the basic principles of medical ethics
- Consider the type of ethical problem
- Choose the ethical analytical approach(es) to use and apply it/them to the problem

A 70-year-old man who has chronic obstructive pulmonary disease, hypertension and diabetes mellitus is admitted to hospital with pneumonia. His memory has been deteriorating for 3 years with a rapid decline in cognition over the last 3 months and he now needs help to carry out his activities of daily living. A neurologist has evaluated him and has excluded reversible causes of dementia. The patient deteriorates and needs mechanical ventilation. His wife states that he told her (when he was well) that he did not want to be put on 'life support machines' and is therefore opposed to mechanical ventilation. Two of his children fail to confirm this and request active treatment. What care should be given?

On the one hand, considered mainly in teleological terms:

The patient is incapable of making an autonomous decision. The clos-

est surrogate indicates that he would have preferred to forego life-sustaining therapy at this stage. (Respect for autonomy might support this.) The consequences of ventilation would probably be to prolong the process of dying (which non-maleficence could argue against) rather than increase his chances of recovery to a good quality of life. Beneficence requires that he receive general care and symptom relief immediately. An appropriate action therefore is not to ventilate the patient but to continue basic medical (fluids, oxygen and antibiotics) and nursing care in a general ward setting in order to optimise patient comfort.

On the other hand, considered in deontological as well as teleological terms:

The present illness is due to a potentially reversible infection. The patient's real preference is uncertain and his family, who have difficulty in looking after him, have expressed differing views. In terms of the duty of a doctor to make the patient's health the first consideration, and of the patient's right to appropriate health care regardless of his age or mental condition, it would therefore be appropriate to institute all possible care, including ventilation on an intensive care unit.

In practice:

The physician responsible for the patient's care should consider the different courses of action suggested, but not determined, by these ethical analyses, explain the reasons for and against each course of action to the patient's family and, if one of them is the patient's legal surrogate, help that person come to a decision. Where there is no legal surrogate, the physician will have to reach a judgement about what is in the patient's best interests, recognising that, while judgement is always fallible, whatever decision is made must be defensible if challenged on legal or ethical grounds. Decisions that are reached on the basis of ethical and moral reasoning will be relatively easy to defend.

In this case, further discussion of the relevant issues with the relatives and other members of the health-care team led to concordance. The patient was treated by artificial ventilation in the intensive care unit for 3 days. He made a good recovery and appeared grateful for the care he had received.

BASIC PRINCIPLES AND METHODOLOGY OF EVIDENCE-BASED MEDICINE

Clinical pharmacology incorporates the most important achievements of modern medicine. One of such achievements is the methodology of collecting, evaluating and applying evidence – based medicine. And, of course, this methodology should take its rightful place in the teaching of our discipline.

According to one of the common definitions, evidence–based medicine is the conscientious, accurate and meaningful use of the best results of clinical research to choose the treatment of a particular patient (Sackett D. L. et al., 1996).

It is interesting to note that the need for professional medical information arises in a doctor up to 60 times a week (or twice for every three patients) and can influence the adoption of at least eight decisions daily. Real clinical practice always has some difficulty in answering the question: what is more important for making a clinical decision – recommendations made based on the results of clinical trials or medical thinking and experience in relation to each specific patient? The answer to this question will seem contradictory to many critics of the DM concept (Fig. 1).

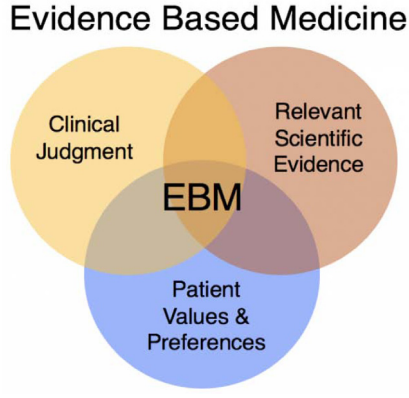

Fig. 1. The «triad» of evidence-based medicine [1]

However, paradoxically, it is the “triad” presented in the figure that most fully characterizes the modern view of evidence-based medicine. A

competent clinician always uses both personal clinical experience and the most up-to-date, evidence-based data of medical science simultaneously and never separately.

It is quite obvious that focusing only on evidence-based medicine data, without taking into account personal experience and the characteristics of a particular patient, can cause errors in the management of the patient. At the same time, focusing purely on personal experience leads to the fact that the patient ceases to receive the most modern and effective treatment, which also harms his health.

The introduction and competent use of the principles of evidence-based medicine carries a number of quite objective advantages .

According to modern qualification characteristics, a properly trained doctor is obliged, firstly, to be able to distinguish evidentiary information from descriptive or simply advertising information. Secondly, he should strive to use in his daily practice only those medical interventions that have a good evidence base.

The solution of these problems is impossible without knowledge of the algorithm for searching for high-quality medical information, as well as the skills of its subsequent extrapolation in relation to a specific clinical situation (Fig. 2).

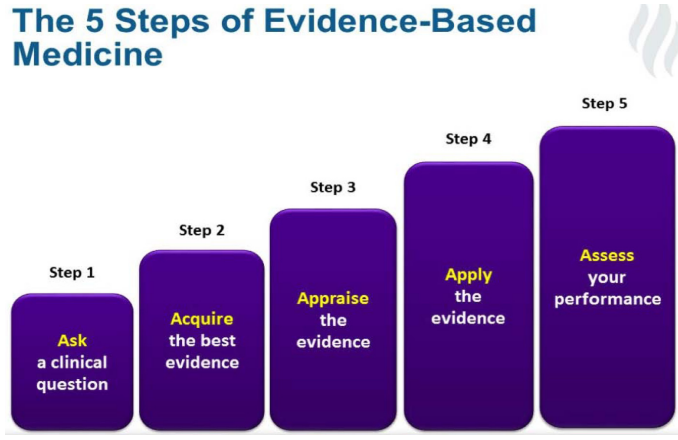

Fig. 2. Steps of evidence-based medicine process [1]

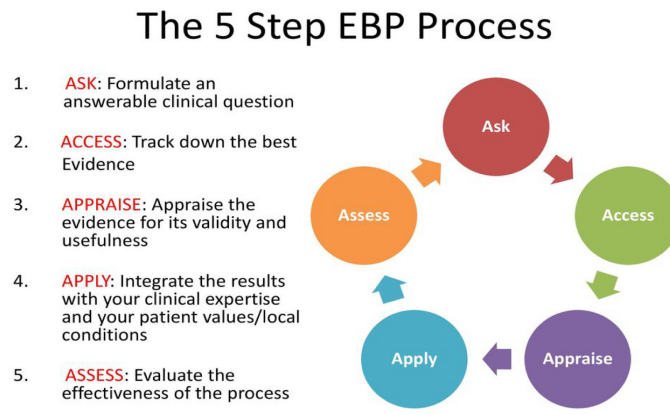

Fig. 3. Steps of search and application of scientifically based information [1].

Thus, the success of this search will largely depend on the ability of the doctor to clearly formulate the question to which he seeks to find the answer.

In addition, the identification of the most valuable information is impossible without access to modern sources of medical information, leading journals and electronic databases. Fortunately, there is an easier way.

Clinical recommendations created by professional communities are designed to significantly reduce the search time and help practitioners keep abreast of the most important trends in world medicine.

CLINICAL RECOMMENDATIONS – GUIDELINES

Clinical Guidelines (recommendations) (Clinical Guidelines) are systematically developed provisions that help to make the right decisions regarding medical tactics in certain clinical circumstances.

In 2002, the methodology for the development of clinical guidelines was developed by WHO, at the same time an International Network of Clinical Guidelines Developers was formed – Guidelines International Network (GIN), which included 42 organizations from 23 countries.

The main purpose of the recommendations is clear – to improve the quality of treatment of patients. However, they can bring patients not only benefits, but also harm. This can happen for a number of reasons:

1) evidence of what exactly needs to be recommended is often insufficient;

2) the data obtained on the basis of research may be interpreted incorrectly;

3) developers may not have enough capabilities and experience to check all the evidence;

4) recommendations may be influenced by the opinions, experience and composition of the development team.

In this regard, it became necessary to create a unified system for assessing the quality of clinical recommendations. To compile an objective view of the quality of clinical recommendations, a structured international questionnaire on examination and certification – AGREE (Appraisal of Guidelines Research and Evaluation) was proposed, consisting of six sections .

The AGREE questionnaire allows you to evaluate:

• openness and transparency of the recommendation development process;

• consistency of interests and opportunities of consumers, buyers and manufacturers of medical services;

• the degree of compliance of the recommended therapeutic, diagnostic and preventive methods and technologies with the current state of medical science;

• objectivity and reliability of information;

• choosing the most cost-effective medical technologies.

The main property of clinical recommendations of high methodological quality is the connection between each statement and scientific facts. Each recommendation is assigned a certain level of evidence so that it is possible to distinguish more reliable from less reliable statements.

It is important to understand that the level of evidence of the recommendation does not reflect its value for practice, but only emphasizes the reliability of the underlying scientific facts, i.e. the likelihood of achieving the desired result if the recommendation is applied. The level of evidence of the recommendation is determined by the following factors:

1) type (structure) of the study (most often the optimal structure is RCT);

2) the number of studies and the total number of patients included (meta-analysis is often needed);

3) uniformity of results (optimal when all results are unidirectional);

4) clinical significance of the effect and its variations (optimal when the confidence interval is narrow);

5) applicability (extrapolability) of the results of the study to the population of interest.

Figure 4 shows a scale of evidence levels.

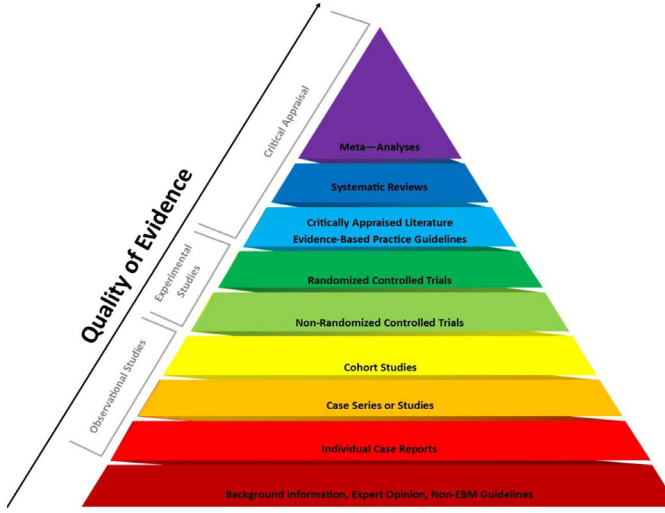

Fig. 4. Quality and levels of evidence [1]

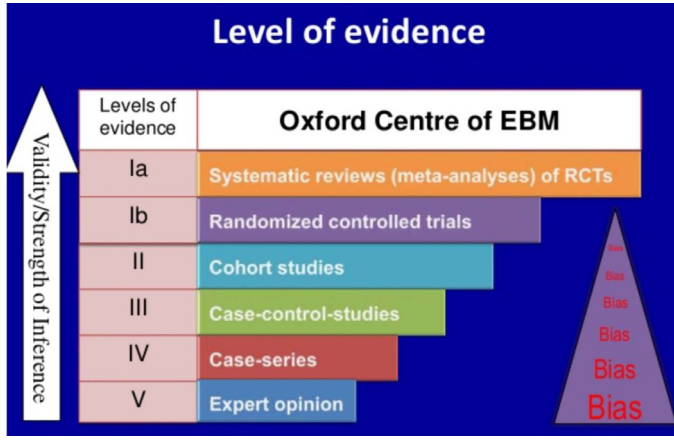

Fig. 5.The levels of evidence by Oxford Centre for Evidence-Based Medicine. [1]

Each of the existing approaches has its advantages and disadvantages.

Grade of recommendation	I Strong recommendation to do	IIa Moderate recommendation to do	IIb Weak recommendation to do	III Recommendation not to do
Conclusions of evidence	Benefits >>> risk & burdens	Benefits >> risk & burdens	Benefits >= risks & burdens	No benefit / Potentially harm
A High level of evidence Consistent evidence from well performed and high quality studies or systematic reviews (low risk of bias, direct, consistent, precise)	Strong recommendation based on high level of evidence	Moderate recommendation based on high level of evidence	Weak recommendation based on high level of evidence	Recommendation based on high level of evidence
B Moderate /Low level of evidence Evidence from studies or systematic reviews with few important limitations	Strong recommendation based on moderate/ low level of evidence	Moderate recommendation based on moderate/ low level of evidence	Weak recommendation based on moderate/ low level of evidence	Recommendation based on moderate/ low level of evidence
C Very low level of evidence Evidence from studies with serious flaws. Only expert opinion, or standards of care	Strong recommendation based on expert opinion	Moderate recommendation based on very low level of evidence Diverging expert opinions	Weak recommendation based on very low level of evidence Diverging expert opinions	Recommendation based on very low level of evidence Expert opinion
Wording in recommendations:				
	We recommend We should Is recommended Is indicated Is useful Is beneficial Is effective	We suggest Is reasonable Is probably recommended Can be useful Can be beneficial Can be effective	We might suggest Might be reasonable Might be considered Usefulness is unknown	We do not recommend Should not be performed Is not useful Is not beneficial Is not effective Is potentially harmful

Fig. 6. Ratio of evidence levels of evidence and classes of recommendations [1]

The evidentiary value of recommendations is assessed according to their class and level of evidence.

Classes of recommendations.

Class I. Evidence and/or general agreement that these diagnostic/treatment methods are favorable, useful and effective.

Class II. The evidence is contradictory and/or contrary opinions regarding the usefulness/effectiveness of the treatment.

Class II-a. Most of the evidence/opinions in favor of usefulness/effectiveness.

Class II-b. Usefulness/effectiveness does not have sufficient evidence/definite opinion.

Class III. Evidence and/or general agreement indicates that the treatment is not useful/effective and, in some cases, may be harmful

Levels of evidence.

Level A. The evidence is based on data from many randomized clinical trials or meta-analyses.

Level B. The evidence is based on data from one randomized clinical trial or many non-randomized trials.

Level C. Agreed expert opinions and/or few studies, retrospective studies, registers.

The highest level of recommendations is I, A [4].

Assessing the possible contribution of a particular study to the development of medical science requires considerable effort than is necessary according to the above hierarchy of evidence. It should be remembered that a low level of evidence is not always evidence of unreliability of the recommendation.

When ranking studies and evaluating their relative contribution to decision-making, it is necessary to use not only a hierarchy of research types, but also common sense judgments. There is a common misconception of not the most competent doctors that evidence-based medicine can replace clinical thinking, and sometimes even a necessity.

We can illustrate this thesis with an instructive anecdote. The doctor calls the Center for Evidence-based Medicine with the question: "How effective are parachutes when rescuing from a crashed plane?". After long discussions, the answer came from the DM Center: "We don't know! RCTs that would compare skydiving and jumping without it have not yet been conducted."

It is important to remember. Clinical guidelines are intended to assist in the formation of clinical judgment, not to replace it. They do not provide ready-made answers to all clinical questions and do not guarantee a successful clinical outcome in each case. In addition, one of the most common misconceptions of doctors is to attribute these scales only to drug therapy. It's not like that! The evidentiary criteria can be applied to any type of medical interventions (surgical, physiotherapeutic, diagnostic, preventive, etc.) [1].

SYSTEMATIC REVIEWS. META-ANALYSES

Another important assistant to doctors are systematic reviews and, in particular, their most common type is meta-analysis. Let's look at them in more detail.

A systematic review is a synthesis of data on one particular clearly formulated problem using systematic and accurate methods of searching, selecting and critically evaluating studies related to the topic of the review, as well as further analysis of the information included in it. Systematic reviews are one of the most important tools of evidence-based medicine, allowing the practitioner to understand the continuous and increasing flow of medical information. Statistical methods may or may not be used to analyze and summarize the results of the studies included in the review.

Archy Cochrane, an English epidemiologist, for the first time proposed the widespread use of meta-analysis as the basis of an algorithm for searching and summarizing the results of published clinical trials. In 1992, the Cochrane Collaboration was organized, an international non–profit organization whose goal is to help make clinical decisions based on reliable information by developing high-quality systematic reviews of the benefits and risks of medical interventions. The main product of the collaboration is the Cochrane Library, which contains the largest database of systematic reviews (https://www.cochrane.org).

Advantages of systematic reviews

• Combining information about several studies allows you to get a more objective idea of the clinical effect of the analyzed intervention compared to a single clinical study.

• Accurate methods limit the probability of systematic error in the search and exclusion of articles, which makes the conclusions more reliable.

• Medical professionals, researchers and organizers easily get access to large amounts of information.

• The time gap between scientific discovery and the introduction of effective diagnostic or therapeutic intervention is eliminated.

• Quantitative systematic reviews (meta-analyses) increase the accuracy of the result.

Meta-analysis is a statistical analysis of the quantitative results of several studies devoted to the same issue (quantitative systematic review). The results of the meta-analysis can be presented in next terms (Fig. 7).

2*2 Contingency table

	Cases	Controls	Total
Exposed	a	b	a+b
Unexposed	c	d	c+d
Total	a+c	b+d	a+b+c+d

OR = (a/b)/(c/d)

RR = (a/a+b)/(c/c+d)

Fig. 7. Calculation of indicators of meta-analysis [1]

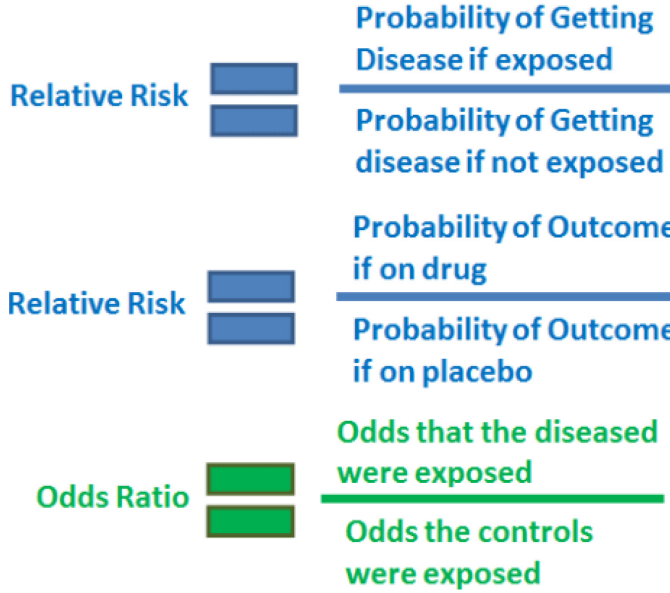

Fig. 8. Indicators to evaluate the results of meta-analysis

We will give explanations for each of them.

1. **Odds ratio (OR)-** The chance of an event is the probability that it will happen, compared to the probability that it will not happen. If we take the probability of an event as P, then the chance that the event will occur is P/(1 – P). The closer the OR value is to 1, the smaller the differences in the effectiveness (safety) of the compared interventions.

2. **Relative risk (RR)-** The ratio of the frequency of development of a certain outcome in comparison groups. With RR > 1, the frequency of development of the studied outcome is higher in the main group than in the control group. With RR < 1 – lower. With a low frequency of outcome development, this indicator is close to the odds ratio [1].

3. **Reduction of relative risk (RRR)-** Decrease in the frequency of events in the study group (FESG) compared with the frequency of events in the control group (FECG):

RRR = (FECG – FESG)/FECG

4. **Absolute risk reduction (ARR)-** Absolute arithmetic difference between the frequency of events in the comparison groups:

ARR=FECG – FESG

5. **NNT for benefit**- the number of Patients who need to be treated with a certain method for a certain time in order to achieve a Favorable Outcome or prevent an unfavorable outcome.

The indicator always assumes the existence of a comparison group (reference group) in which patients receive a placebo, or other treatment, or do not receive it at all. The NNTfor a certain intervention is the inverse of the ARR for this intervention.

The simplicity of the calculation makes it possible to use the NNT as the main digital indicator of the effectiveness (or potential harm) of the analyzed intervention.

6. **NNT for harm-** the number of Patients who need to be treated with a certain method for a certain time to identify an additional Adverse Outcome [1].

Knowledge of this indicator makes it possible to more fully assess the degree of risk of intervention in a particular patient. This indicator is of particular importance when assessing the feasibility of preventive intervention.

Graphical representation of meta-analysis results (blobogram). Figure 9 shows an example of a meta-analysis considering the side effects of the liver during intensive statin therapy compared with the standard prescription regimen in patients with acute coronary syndrome and patients with stable angina. A three-fold (or more) increase in the activity of hepatic transaminases was taken as a recorded event.

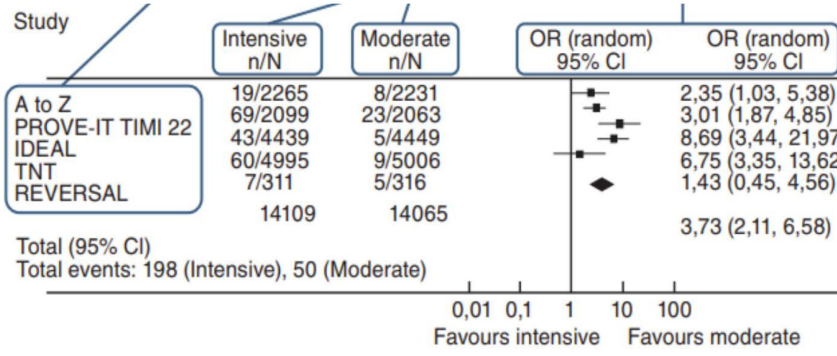

Fig. 9. An example of constructing a blobogram (J. Afilalo et al. Intensive station therapy in acute coronary syndromes and stable coronary heart disease: a comparative meta-analysis of randomised controlled trials/ Heart. – 2007, V. 93. – P. 914-921, with changes) [1]

The results obtained in each of the studies are shown on the blobogram (Fig. 10) in the form of squares. A horizontal line departs from each square, showing the confidence interval (in this case, it is 95%) for the outcome recorded in this study.

The vertical line in the center of the drawing is the «no difference» line, which in this case corresponds to the odds ratio of 1.0.

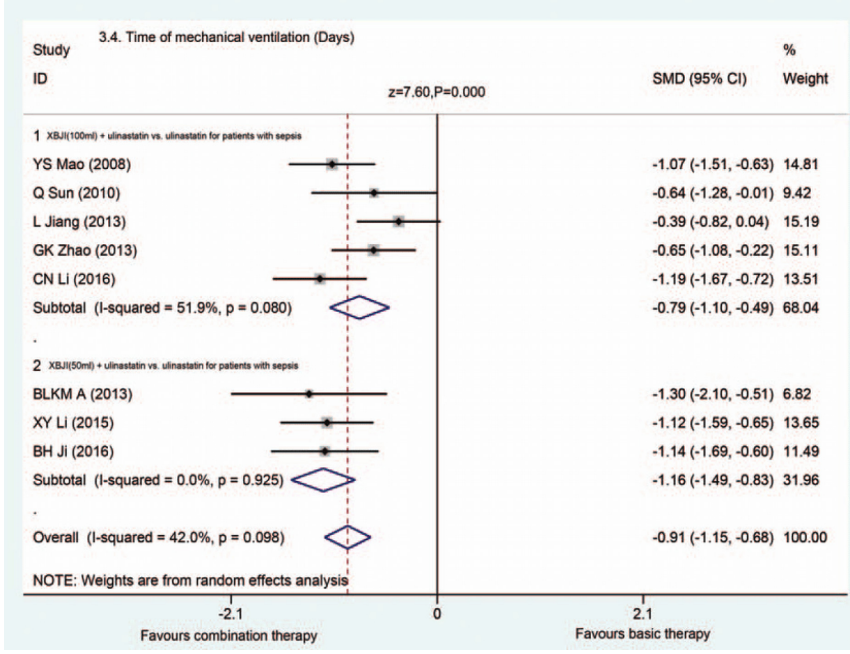

Fig. 10. Example of a blobogram [1]

If the horizontal line (confidence interval) of the study results does not cross the line of "no differences", then there is a 95% probability that differences between the compared groups do exist.

If the confidence interval of the result crosses the vertical line, it means that:

1) or there are no significant differences between the studied interventions;

2) either the sample size is insufficient to determine the true result;

3) the rhombus displays the generalized result of all analyzed studies. The width of the rhombus displays the confidence interval for the generalized result;

4) since the rhombus does not cross the «no difference» line, the result can be considered statistically significant, i.e. the administration of high doses of statins is significantly accompanied by an increased risk of side effects from the liver compared with moderate doses.

It is important to remember that as a result of applying any statistical method, we do not get the ultimate truth, but only an estimate of the probability of a particular assumption!

The purpose of the meta-analysis is not only to evaluate the effectiveness/safety of the intervention under study, but also to identify, study and explain the heterogeneity (heterogeneity) in the results of studies and subgroups of patients.

To do this, it is mandatory to conduct a test for statistical heterogeneity $\chi 2$ (Chi-squared). The value of $\chi 2$ much greater than the number of tests in the meta-analysis indicates that the tests differ from each other. If significant differences between studies are found, the conclusions of the meta-analysis can be questioned.

The results of the meta-analysis have important scientific and practical significance:

- they are a source of objective information about modern methods of diagnosis, prevention and treatment;
- serve as a basis for the development of formulary systems, diagnostic and treatment standards, and evidence-based recommendations;
- stimulate the conduct of specific clinical trials, as they form a scientific hypothesis and allow you to more accurately determine the volume of the planned sample of patients.

Perceptions of the effectiveness of drugs may change as additional data become available after the completion of large randomized controlled trials. New data are emerging and the results of systematic reviews are changing.

Therefore, it is extremely important to use the most recent of them in practical work. Systematic reviews can provide objective information that allows the patient and the doctor to predict the effectiveness and possible consequences of a particular intervention even before the start of treatment.

When extrapolating data from systematic reviews, the doctor must first assess the degree of its compliance with the group of patients for whom the positive effect of the intervention was revealed. Undoubtedly, the personal experience of the doctor and the existing standards of treatment should be taken into account when making a final decision.

So, evidence–based medicine is:

1) applied methodology, which arose as a result of the rapid progress of medical science, the increase in knowledge and information explosion;

2) organic synthesis of the individual experience of the practitioner with the results of the best scientific research on the evaluation of the effectiveness of medical interventions.

3) an industry that does not replace the art of healing and clinical thinking of a doctor, but rather improves the quality and effectiveness of medical practice [1].

PROBLEMS OF EBM

It makes sense to mention that every medal has two sides.

International clinical guidelines based on evidence-based medicine are the basis of clinical practice in most countries of the world. Without evidence of efficacy and safety, no medicinal product can be allowed to be sold on the territory of most modern states. Clinical trials of medicines in the modern world are conducted according to agreed generally accepted protocols that provide a sufficient level of evidence of efficacy and safety.

It would seem that everything works like clockwork – what's to worry about? However, there is another face of evidence-based medicine:

1) for example, control over the quality of clinical trials is a new separate global problem. Is the unity of producers and supervisors not a source of danger and the possibility of collusion? When reading some medical articles, sometimes there is a feeling that everything can be proved, there would be knowledge of the rules for collecting evidence, good funding, and a fairly large sample of patients.

2) clinical recommendations and significant decisions in the medical field are made based on the results paid for by manufacturers of medicines and equipment. We are constantly faced with contradictions between how to treat correctly, and how it is prescribed by various methodological recommendations, and sometimes national, legislatively approved standards. The reason for this lies in the differences in the interests of the pharmaceutical business and the healthcare system. So is a conflict of interest possible? Yes. Required? There is no definite answer.

3) in the clinical practice of a number of states, methods are used that have not received unambiguous evidence as a result of clinical studies and subsequent meta-analyses (for example, acupuncture, manual therapy, etc.). Should I abandon these methods? World practice knows the negative results of some hasty decisions.

4) it is known that a number of drugs that have not received definite unambiguous evidence as a result of clinical studies (for example, oral chondroprotectors, nonspecific antiviral drugs, metabolic drugs, and others) form the basis for the treatment of certain diseases. Should I give up these medications?

5) the collection of evidence in itself today is an expensive event, accessible only to large capital and, by the way, practically inaccessible to the public sector.

6) the evidence base today is one of the ways to protect the commercial interests of some structures (states, national markets) from others. Everything is very complicated, difficult to overcome, very expensive and, often, is a specially created barrier to new drugs. By the way, the difficulty of overcoming this barrier is particularly significant for our own scientific developments in this area, which is voiced today at the highest state level [1, 2, 3].

THE IMPORTANCE OF EPIDEMIOLOGICAL STUDIES IN OBTAINING EVIDENCE

"How does an epidemiologist differ from a clinician? When a clinician is asked how his wife's health is, he usually answers good, satisfactory, bad. When an epidemiologist is asked the same question, he answers "And compared to whom?" Evidence-based medicine has developed largely on the basis of epidemiological studies and many of the terms and methods used in evidence-based medicine are taken from epidemiology. In Russia, the term epidemiology is often understood as the epidemiology of infectious diseases, although for more than a decade the main cause of death, including "supermortality", are non-communicable diseases (NCDs), primarily cardiovascular diseases (CVD).

Therefore, it is necessary to intensively develop the epidemiology of

NCDs in our country, both when studying at the pre-graduate and post-graduate levels, and when conducting epidemiological studies and using the results obtained to make political, financial and organizational decisions, of course, if we want to make a correct, complete diagnosis to the Russian society and recommend scientifically based actions for treatment, prevention diseases and health promotion.

Conducting epidemiological studies is practically making a diagnosis at the population level. Their importance is not limited to studying the prevalence of diseases and their complications, but allows identifying factors contributing to the occurrence and progression of diseases, assessing the quantitative contribution of these risk factors to the development of diseases and their further course, stratifying the population according to the degree of risk and determining the prognosis, monitoring the level of risk factors and evaluating the effectiveness of preventive programs, without waiting for changes in morbidity or mortality (endpoints), plan clinical trials, formulate and test hypotheses.

It was largely thanks to epidemiological studies that the importance of dyslipidemia, arterial hypertension, smoking and diabetes mellitus was shown in the development of an epidemic of atherosclerosis and related diseases among the population, clinical studies were carried out and recommendations for the treatment and prevention of these diseases were developed, both at the population and individual levels.

Poor knowledge of the basics of epidemiology leads to the fact that in our country, epidemiological studies are often identified with mass surveys. However, not all mass surveys are epidemiological, just as not all epidemiological studies should be mass.

The following minimum requirements for epidemiological studies can be distinguished: the sample should be random and representative (for example, for a region or a population that we want to study), the response of the surveyed population should be at least 70% (people who already have symptoms of the disease are more likely to be the first to be invited to participate in the study, which may lead to an incorrect conclusion about the prevalence of the disease among all population), survey methods should be clearly defined and standardized (especially, if different groups of doctors take part in the study), the analysis of the results obtained should be carried out according to a single predetermined methodology, preferably in one center and by independent experts.

But even these minimum requirements are often not met in our country when conducting research claiming to be epidemiological. For example, an article on the treatment of arterial hypertension in various regions of Russia is published in one of the peer-reviewed medical journals.

At the same time, the authors indicate that the object of the study were patients with arterial hypertension who turned to internists, cardiologists of polyclinics, diagnostic and advisory centers, dispensaries, hospitals, research institutes, military hospitals and other medical institutions.

Firstly, the authors do not indicate how random this sample was, and secondly, it cannot be representative, because it is not clear what it is representative of, since treatment in a polyclinic and in a research institute or hospital can vary significantly, and with a general analysis everything will be it depends on how many of these institutions were included in the study in different regions.

Today in Russia, full-fledged epidemiological studies of NCDs are carried out relatively rarely, mainly due to the lack of funding: only in rare regions does the administration allocate funds for such studies, pharmaceutical companies are not interested in conducting them, international organizations allocate funds mainly for healthcare reforms and do not want to finance epidemiological studies [5].

THE IMPORTANCE OF CLINICAL RESEARCH AND GUIDELINES FOR MEDICAL PRACTICE

"Some doctors have been making the same mistakes for twenty years in a row and call it clinical experience" N. Fabrikant The author of this statement very well noticed the essence of medicine based on the opinion of experts and personal experience. Unfortunately, even today our doctors are often based on personal experience when making decisions about the choice of treatment.

Thus, in the ARGUS study conducted in Russia in 2002 (V.S. Moiseev and J.D. Kobalava), 69% of doctors focused primarily on personal experience when asked about the justification of the first choice of a hypotensive drug. At the same time, the basis of evidence-based medicine is clinical research, which serves as material for a systematic review,

meta-analysis and development of clinical guidelines (recommendations) based on them.

The importance of clinical research lies in the search for effective and safe methods of diagnosis, treatment and prevention and, on this basis, the creation of recommendations for wide clinical use. The following values and limitations of clinical randomized trials are noted.

Values:

– randomization is the most reliable procedure to avoid mistakes in the formation of treatment and control groups;

– a large number of patients guarantees the identification of differences in primary endpoints;

– most cases used as endpoints are certain clinical events (death, myocardial infarction, stroke).

Limitations:

– Selection of patients with clearly defined indications and contraindications. Most often, patients with high risk are selected, as this allows to obtain statistically reliable results relatively quickly. Therefore, extrapolation to patients with a different level of risk is questionable;

– most studies lack the strength to obtain differences between secondary endpoints. Therefore, often in the treatment of arterial hypertension or hypercholesterolemia, it is possible to obtain a significant reduction in mortality from CVD (primary endpoint), in the absence of such reliability in relation to total mortality (secondary endpoint);

– treatment programs in studies often differ from those in real clinical practice;

– adherence (compliance) to treatment, due to the higher motivation of patients in research, is higher than in clinical practice;

– controlled randomized trials last 4-5 years, while the life expectancy of a patient, for example, with middle-aged hypertension, is 20-30 years.

Therefore, side effects that did not manifest themselves during the clinical trial may appear later, a similar situation may be observed with respect to the beneficial effects of treatment.

Disease outcomes in clinical trials are often referred to as endpoints. It is important that they are clear clinical events (death, myocardial infarction, stroke). However, it often takes a long time to obtain them, so in relatively small and short-term studies, so-called surrogate endpoints

are used to evaluate the effectiveness. For example, in the treatment of arterial hypertension, the level of blood pressure reduction is assessed or in which number of patients the target level was achieved. However, surrogate points can be considered reliable predictors of end events if it is established that:

– there is a strong, independent biologically probable connection between the clinical and surrogate endpoint;

– there is evidence from randomized clinical trials with the same class and with other classes of drugs that an improvement in the surrogate endpoint led to an improvement in the target outcome.

The use of the principles of evidence-based medicine involves a combination of individual clinical experience and optimal evidence obtained through a systematic analysis of clinical trials. Not all clinical studies have the same evidence. In Russia, clinical trials with a low evidence level are still quite often conducted. The main reason is the practical lack of funding for independent clinical trials, so most clinical trials are carried out with the financial support of pharmaceutical companies that are not always interested in conducting expensive high–evidence studies.

The evidence of clinical trials in descending order of reliability is as follows:

- randomized double-blind controlled (using a placebo or comparison with another standard drug);
- non-randomized controlled;
- non-randomized with historical control;
- type of "case-control";
- cross -;
- observational without a comparison group;
- description of individual cases.

The effectiveness of any therapeutic or preventive intervention is often studied in numerous clinical studies, the results of which may be heterogeneous. Usually, the results of these studies are summarized in descriptive reviews, which allows you to quickly get an idea of the issue of interest.

However, the content of such reviews may be influenced by the author's opinion, as well as an incomplete selection of the analyzed studies,

which may lead to a misconception about the drug or treatment method. Systematic reviews help to avoid these shortcomings.

A **systematic review** is practically a scientific study, the material for which is the results of clinical trials. Its purpose is a balanced and impartial study of the results of previously performed studies. The main requirement is the analysis of all high-quality original research on a particular problem. A quantitative assessment of the total effect established on the basis of the results of all the studies studied is carried out using meta-analysis.

Stages of a systematic review:

1. Planning of the study, during which the purpose of the proposed meta-analysis is determined; criteria for the selection of studies; method of statistical analysis; methodology of information retrieval; indicator of the effectiveness of treatment.

2. Search for information, the task of which is to include all adequate studies on the problem under study, for which various databases are used (Medline, Cochrane Controlled Trials Register and others), as well as articles and references in various publications.

3. The selection of studies is carried out on the basis of predetermined fundamental criteria, changes of which are not allowed in the future.

SOCIO-ECONOMIC AND LEGAL ASPECTS OF CLINICAL GUIDELINES

The gap between modern medical capabilities and available resources is growing rapidly, mainly due to the increase in methods of effective diagnosis and treatment.

Guidelines can be useful both for doctors and for the public, indicating the minimum acceptable standards. Failure to enforce these standards may have legal consequences for those responsible for their enforcement.

The task of doctors preparing guidelines is to translate the results of clinical trials into clinical recommendations. Putting clinical recommendations in the economic context of a specific healthcare system is the task of the government and the heads of health authorities.

Clinical guidelines have no formal legal force, but are a tool that helps

doctors make the optimal therapeutic choice. However, they can be used to resolve issues about the correctness of treatment, including in court.

The fact that there is a "Manual" or "Protocol" for the treatment of a particular condition does not mean that following it will be correct in various situations or not following it will be negligence. At the same time, as the provision of guidance-based care is becoming more and more common, acting outside the guidelines/guidelines may put the doctor in front of the possibility of being accused of negligence if he cannot provide specific evidence for this situation.

Evidence-based medicine is not perceived positively by everyone. There are also critics of this approach. The unfounded criticism of clinical recommendations by supporters of individualized treatment is that:

1. Recommendations, as a rule, leave a fairly wide field for maneuver (for example, recommendations for the treatment of hypertension allow the doctor himself to choose a drug and combinations of drugs from 7 existing classes of drugs, depending on the specific clinical situation).

2. The recommendations are based on real facts and exclude the widespread use of inadequate diagnostic and treatment methods. At the same time, it should be borne in mind that clinical guidelines refer to the "average" patient, and the doctor treats an individual patient.

The importance of guidelines should not be overestimated and the knowledge and clinical experience of a doctor should not be underestimated. The guidelines themselves are only good for the vanity of their authors, if they are not implemented in real clinical practice.

At the same time, there is a large gap worldwide between the use of recommendations/guidelines and actual clinical practice.

Reasons for insufficient use of guidelines:

– doctors do not know about their existence or do not believe them, or do not care about their implementation;

– doctors believe they are overloaded with manuals;

– doctors adhere to strategies based on surrogate endpoints or on the results of studies that have no statistical force;

– doctors rely on their personal experience and impressions that this therapeutic approach is the best ("impressionist medicine");

– the impact of economic and social factors (however, guidelines should describe the best available evidence, cost/benefit analysis should be conducted by health managers).

How to improve the implementation of clinical guidelines.

1. Involvement of representatives of healthcare management bodies, educational and scientific medical institutions, qualified and reputable specialists in the regions in the development of clinical guidelines, who will subsequently implement these recommendations locally.

2. Active participation of professional medical societies (associations) in the dissemination of clinical guidelines, which should be the basis of all educational programs conducted under the auspices of the society.

3. Mandatory inclusion of clinical guidelines in continuing medical education programs.

4. Interaction of specialists, health care managers and pharmaceutical industry is necessary in order to avoid a conflict of interests [4].

HOW TO FIND THE BEST EVIDENCE?

Sources of information on evidence-based medicine. The search for evidence to solve a clinical problem. Stages of the search for an answer.

In modern conditions, in order to find optimal approaches to solving clinical issues, one should be based on the principles of evidence-based medicine. Evidence of the effectiveness of certain interventions is the result of multicenter double-blind randomized trials. The end result of such studies is an assessment of the impact of the intervention under study on «hard endpoints» – overall mortality, mortality from cardiovascular diseases, the occurrence of severe complications such as myocardial infarction and cerebral stroke.

Sometimes the evidence of the effectiveness of a particular method of influence is based on its effect on the «surrogate» points. The growing interest in surrogate points can be explained by the possibility to significantly reduce the sample size, duration and cost of clinical trials. Surrogate points in assessing the effect of treatment are possible in situations where it is difficult and unethical to use basic outcome indicators.

When evaluating the effectiveness of drug therapy , the following surrogate endpoints are most often used:

– with arterial hypertension – a decrease in blood pressure,

– with chronic heart failure – an increase in the ejection fraction,

– with cerebral stroke – an improvement in neurological status or intelligence,

– with atherosclerosis – a decrease in low–density lipoprotein cholesterol,

– with diabetes mellitus – a decrease in blood glucose and glycated hemoglobin,

– with osteoporosis – an increase in bone mineral density.

But we must remember that by changing the surrogate endpoint it is not possible to answer such important clinical questions like this: What is the purpose of treatment for this patient? Which treatment, according to reliable and reliable clinical studies, is the best for this pathological condition? The use of a single surrogate point as the main criterion for the effectiveness of treatment reflects only "narrow" clinical concepts, since other parameters are ignored. When obtaining reliable information when searching for an answer to formulated clinical questions, it should be remembered that different types of studies have different values ("hierarchy of evidence"). (see Recommendation classes and evidence levels).

The data obtained with the help of modern scientifically-based methods in large controlled clinical trials using a randomized, controlled method of studying the effectiveness of drugs form the basis of evidence-based medicine. However, it should be remembered that both low-quality meta-analysis and RCTs with serious methodological shortcomings are inferior in importance to a large and well-organized cohort study. A study called a "case series" is regarded as the lowest level in the hierarchy of evidence. This, in fact, is not even proof, but suspicion, so when looking for an answer to a clinical question, it is not advisable to use such studies.

Sources of EBM includes:

– materials of individual studies: publications on a problem of interest or close to the one being studied; materials are selected only for those studies whose structure ensures the minimum probability of systematic errors and the greatest reliability of the results obtained;

– systematic reviews: represent generalized available research evidence; they use approaches that reduce the possibility of systematic and accidental errors and are intended for dissemination in clinical medicine;

– brief reviews: they are based on the main methodological characteristics, as well as the results of individual studies or systematic reviews that allow applying these data when choosing treatment tactics for a particular patient;

– system sources of information: articles prepared on the basis of several reviews on certain issues; practical guides that present algorithms for clinical solutions; reference books of evidence-based medicine that contain as much information as possible to choose a management strategy for a particular patient 2].

Before using evidence-based information, it should be found. How and where can I find it?

Currently, any scientific information can be found on the Internet. The existing sources of evidence have been critically evaluated and most of them are available electronically. Constantly updated computer databases allow you to quickly search for the necessary information.

Which electronic database can be considered the best? This is mainly determined by the type of clinical question you are interested in and the time you can spend searching for information. When searching for an answer to a correctly formulated clinical question, you should start with those databases that include only materials that meet certain criteria of methodological quality (Fig. 10).

These primarily include MEDLINE, Best Evidence, Clinical Evidence, EMBASE, Cochrane Library. Most often, researchers turn to electronic databases, such as MEDLINE or EMBASE, which provide relatively quick access to a large amount of information. MEDLINE, for example, indexes approximately 4,000 out of 16,000 biomedical journals, but does not take into account publications issued before 1966, conference proceedings, books and dissertations.

To fill this gap, you can turn to other databases, which allows you to increase the coverage of journals (EMBASE, for example, includes more than 1,000 journals unaccounted for in MEDLINE). In addition, there are many other general and thematic databases, for example, BIOSIS, CINAHL, PsychLit, CancerLit.

Some databases include publications in languages other than English, conference proceedings (International Scientific and Technical Proceedings database), dissertations (Index to UK Theses Dissertation Abstracts),

unpublished research materials (SIGLE– System for Information on the Grey Literature). However, these databases are not always available or access to them is too expensive, and each requires developing its own search methods.

База данных	Адрес в Интернете
ACP Journal Club	www.acponline.org/journals/acpjc/jcmetui.htm
Best Evidence	www.acponline.org/catalog/electronic/best _evidence.htm
Cochrane Library	www.update-software.com/ cochrane/cochrane-frame.html
UpToDate	www.update.com
MEDLINE PubMed	www.ncbi.nlm.nih.gov/PubMed (бесплатная)
Internet Grateful Med	igm.nlm.nih.gov
Другие базы данных	www.niedmatrix.org/info/medline-table.asp
Scientific American Medicine	www.samed.com
Clinical Evidence	www.evidence.org
Harrison's Online	www.harrisonsonline.com
eMedicine	www.emedicine.com (бесплатная)
Medscape	www.medscape.com/Home/Topics/homepages.html (бесплатная)
Medical Matrix	www.medmatrix.org/index.asp (бесплатная)
ScHARR Netting the Evidence	www.shef.ac.uk/~scharr/ir/neiiing (бесплатная)
Medical World Search	www.mwsearch.com (бесплатная)
Journal Listings	www.nthames-health.ipmde.ac.uk/connect/journuls.htm www.pslgroup.com/dg/medjournals/htm (бесплатная)
Clinical practice guidelines	www.guidelines.gov www.cma.ca/cpgs (бесплатная)
MD Consult	www.mdconsult.com
Evidence -bused Medicine Reviews (OVID)	www.ovid.com/products/clinical/ ebmr.cfm (доступна во многих медицинских библиотеках)
SUM Search	http;//SUM Search.uthscsa.edu

Fig. 10. Constantly updated medical electronic databases [3]

You should make sure that in the database that you have chosen, you can find the most complete answer to the clinical question of interest. When searching for an answer to a private, correctly formulated clinical question, it is best to start with those databases that include only materials that meet certain criteria of methodological quality, for example, Best Evidence, Clinical Evidence or Cochrane Library.

Accessing these electronic databases allows for a quick and effective search for systematic reviews. The use of special criteria («filters») ensures the inclusion of high methodological quality studies in the database.

When looking for answers to general questions, it is better to turn to constantly updated educational databases that include a large amount of information. An example of such information resources are the databases UpToDate and Scientific American Medicine, which are constantly updated with new scientific data. Articles in these electronic databases contain detailed bibliographic lists that allow you to determine the time of writing of a particular section of the textbook, moreover, if desired, you can read the text of the original article.

There are also medical textbooks that exist only on the Internet (for example, eMedicine). As the volume of evidence-based information increases, which is rapidly updated, electronic information resources become an increasingly important source of information for finding answers to both private and general questions.

The search in electronic databases begins with the definition of keywords relevant to the topic of the review, then, depending on the amount of information found, the search can be specified by specifying the type of research and intervention, and then select only human studies.

Due to imperfect indexing, the final stage of the search should include both keywords from the list of indexed categories specific to each database and keywords found in the text of articles. To determine the most appropriate keywords, articles that meet the inclusion criteria are pre-studied. Then they search for articles published in recent years, and, in accordance with the revealed data, the keywords are changed. Ideally, you need to check the completeness of the electronic search by comparing its results with the results of a manual search in selected journals [3].

BASIC STANDARDS OF CLINICAL TRIALS. PRINCIPLES OF GOOD CLINICAL PRACTICE

The 2002 Handbook of the World Health Organization (WHO) for Good Clinical Research Practice (GCP) states that in order to establish the safety and effectiveness of specific sanitary and medical products and practices, it is necessary to conduct clinical studies. Randomized controlled clinical trials (designed to answer important scientific and medical questions) contributed to much of what we now know about the safety and

efficacy of specific drugs and treatments. At the same time, the Handbook emphasizes that "such a study can be relied upon only if it is conducted in accordance with the principles and standards collectively referred to as "Good Clinical Practice" (WHO, 2002).

The Guidelines for Good Clinical Practice of the International Conference on Harmonization (ICH) 2016 define the GCP as "a standard for the design, conduct, implementation, monitoring, audit, recording, analysis and reporting of clinical trials that ensure the reliability and accuracy of data and recorded results, as well as the protection of the rights, integrity and confidentiality of research subjects".

Principles of GCP aimed at the safety, protection of the rights and health of research participants, as well as the validity and quality of research data.

The thirteen principles of the 1996 GCP guidelines are as follows:

Principle 1: Research should be conducted in accordance with the Helsinki Declaration and in accordance with the GCP and all applicable regulatory requirements**.**

Principle 2: Any predictable risks and inconveniences for the subject should be compared with the expected benefits.

Principle 3: The rights, safety and health of participants always take precedence over the interests of science and society.

Principle 4: Available preclinical and clinical information about the investigational drug should be adequate to ensure the study.

Principles 5 + 6: The study must be scientifically sound and described in a clear detailed protocol approved by the Independent Ethics Committee (IEC) /Expert Council of the organization (ECO), and which must be followed.

Principle 7: Medical care should be provided by a certified medical professional.

Principle 8: Persons involved in research should have appropriate training in terms of education, training and experience to carry out their tasks.

Principle 9: Informed consent must be voluntarily provided by each participant in the study.

Principles 10 + 11: Information should be recorded, processed and stored in a way that ensures accurate reporting, interpretation and con-

trol of correctness, as well as ensures the confidentiality of records about study participants. This applies to all records regardless of the type of media used.

Principle 12: The studied drugs should be used in accordance with the approved protocol.

Principle 13: Systems that guarantee the quality of all aspects of testing should be applied with a focus on ensuring the protection of the subject and the reliability of test results.

Everyone who participates in clinical trials should have an understanding of the GCP. At the same time, three key roles need to be identified in order to understand why adherence to GCP standards is so important for clinical trials. These are: Sponsor, Researcher and Junior Researcher.

Sponsor – An individual, company, institution or organization that undertakes to initiate, direct and/or finance clinical trials**.**

Researcher – The person responsible for conducting clinical trials on the clinical basis of the study. If the tests are conducted by a group of individuals on the clinical basis of the study, the researcher is the responsible leader of the group and can be called the main tester.

A **junior researcher** is any individual member of a clinical trial team assigned and reporting to a researcher on a clinical basis to perform important procedures related to trials and/or make important decisions related to trials (for example, junior staff, interns, researchers).

In some regions, such as Europe and the USA, the requirements of the GCP 2016 guidelines have been introduced into legislation. However, although this requirement is limited to specific studies, such as interventional trials with investigational medicines, the sponsor and many other organizations (for example, funding organizations, publishers) require that studies be conducted in accordance with the principles of the GCP in order to ensure similar "standards".

It is important for researchers in low- and middle-income countries to clearly demonstrate that they apply the principles of the GCP and thus work according to the same standards. Thanks to this, such studies ensure that their participants are protected, and the results are as reliable as the results of a test conducted in any other GCP-compliant study in the world.

All persons involved in the implementation of any aspect of the clinical trial must be qualified to perform their tasks in accordance with the requirements of the GCP. According to the GCP, "to be trained" means

that every person involved in conducting research should be able to do their job thanks to: training, training, experience.

Responsibilities of researchers.

According to the NCP methodological guidelines, the following aspects of research are the responsibility of the researcher:

1. Obtaining the informed consent of the study participants.
2. Procedures for randomization and disclosure of the randomization code, if necessary.
3. Medical care of the study participants.
4. Exchange of information with the IEC/ECO.
5. Processing of the studied drug and control over it on the base.
6. Compliance with the research protocol.
7. Qualified staff and contracts.
8. Managing reports and reports.
9. Security monitoring.
10. Ensuring the availability of sufficient resources.
11. Management and control in case of early termination or suspension of the study.
12. Progress reports and final reports.

The researcher must always comply with ethical and regulatory international and local requirements for the informed consent process.

Informed Consent is a process whereby a person voluntarily confirms his/her desire to participate in a particular test after he/she has been informed about all aspects of the test relevant to such a person's decision to participate in it. Informed consent is documented in the form of a written form of informed consent, signed and dated.

The main condition is that before starting the study, the researcher must receive written approvals from the IEC/ECO. The participant of the study (or his legal representative) must, at the time of issuing consent, be fully informed about all relevant aspects of the study, including approval from the IEC/ECO. If a person cannot read, an independent witness must be present. The 2002 guidelines of the Council of International Medical Scientific Organizations (CIMSO) emphasize that if the person receiving consent does not speak or read the language of the participant in the study, then such a person can obtain consent from such a participant only in the presence of a witness who understands the participant's language.

The witness signs an Informed Consent Form (ICF) to confirm that he has made sure that the research participant understood the information, received answers to his questions and voluntarily provided his consent. The participant provides his mark / fingerprint, and the accepting consent enters his name.

The participant must sign/mark the consent form before taking part in the study. A signed/marked copy of the consent form must be issued to the participant; a blank form is not accepted as a consent document. The entire process of issuing informed consent, including all documentation regarding the provision of new information, should be recorded in the medical record/source file.

Should be included in the information provided to the potential participant of the study:

information about all relevant parts of the study, such as its purpose, duration, how many people will be recruited, the necessary procedures (including, if applicable, randomization), the statement that this is a study and not an individual medical treatment, as well as the main contacts;

a guarantee that a person can always ask the research group for additional information at any time and, if the person changes his mind to participate, he can leave the study without explanation;

explanation of the benefits and risks of participating in the study, costs and compensation that can be provided;

additional data regarding participation in the study, the duration of involvement in the study, what actions will be taken if a participant is injured in connection with participation in the study, and whether there are any alternative treatments/options available to him;

information about who has access to the participant's personal data and how such information will be processed;

an explanation that if a more effective treatment is developed, or if it is determined that the study is unsafe, then the study may be stopped and the participant's participation will be terminated.

The consent recipient must provide the person with sufficient time and opportunities to inquire about the details of the study and make a decision on participation or refusal to participate. All questions about the study must be answered to a satisfactory degree for the person. A potential participant should not be forced by force and should not be pressured to express consent to participate in the study.

When studies include persons who are unable to give their consent (for example, minors who are incapacitated due to mental illness), such a person should be informed in a way they understand and, if possible, should declare consent and sign/mark the consent form. Then the informed consent form will be signed and dated by the legal representative of such person.

In emergency situations, when the prior consent of the participant is not possible, the consent of his legally recognized representative should be obtained. When it is impossible to obtain the prior consent of the participant, and his representative is absent, the recruitment process for the study participants should be described in a protocol or other document approved by the IEC/ECO, and usually involves the involvement of an independent witness. The subject or his legal representative must be notified as soon as possible and must provide consent to continue and other consent, if necessary. This usually refers to studies in which victims of some kind of injury may be involved.

Special grounds are required to attract vulnerable persons to participate in the study. If they are selected, their rights and health should be strictly protected, and participation is justified only if the research meets their needs and the priorities of their community.

Procedures for randomization and disclosure of the randomization code.

The researcher must follow the procedures for randomization and closure of information about the participant, as indicated in the study protocol. Random selection intervention distribution was introduced in studies conducted under controlled conditions in order to reduce cases of biased selection, so that participants in one group were not different from participants in another group.

Various methods can be used for randomization and, as a rule, the statistician determines the appropriate method for the research question and the construction of the study. The researcher must strictly follow the randomization scheme to ensure an unbiased distribution of participants in the compared groups.

The closure of information (also called “masking”) is used in studies conducted under controlled conditions in order to avoid a conscious or

unconscious observation error in relation to the persons involved, which invalidates the result. The closure of information can be one-sided, so that only the participants cannot know what they are receiving, or two-sided, so that neither the participants nor the researchers would know about the treatment in each group.

Another way to close the information is that only observers who evaluate certain criteria, such as laboratory personnel or clinical personnel evaluating the effectiveness or safety of the final evaluation criteria, do not have access to the information.

There are situations when it may be necessary to unmask the intervention that the participant received. Lu and Davis (2010) state that "there are very few valid reasons for revealing the masking of data in a study, while such reasons include situations in which the course of treatment of a participant depends on knowing which drug was used under study." The protocol should contain procedures to be followed when disclosure is required, and the researcher should be familiar with and follow such procedures.

It is important to remember that the rights, safety and health of research participants always take precedence over the interests of science and society. Therefore, it is necessary to monitor the participants of the study, and in the case of any suspected adverse events (AE), the presence of a medical researcher is necessary.

Adverse event –any adverse medical manifestation in the patient taking the drug or the subject of a clinical trial, and which does not necessarily have a causal relationship with the treatment being carried out. An adverse event (AE) can thus be any unfavorable and unintended sign (for example, a laboratory test result deviating from the norm), a symptom or illness temporarily associated with taking a medical (investigational) drug, regardless of whether they are considered related to this medical (investigational) drug or not.

The doctor should make sure that adequate measures have been taken in the case of AE or in the case of deviation from the norm of laboratory analysis indicators with clinical manifestations. The participant should be informed if medical assistance is required for an illness that occurred in the interval between the studied effects or during them. It is also recom-

mended that the person's doctor (if one exists) was notified of participation in the study, if there is the consent of the participant.

Any AE, illness or deviation from the norm of laboratory analysis indicators with clinical manifestations, actions taken and treatment should be documented. It must also be registered if the person refuses to continue participating, including the reason for the refusal, if the participant wishes to indicate such.

All errors and deviations from the results of laboratory analysis must be documented and reported to the sponsor and all appropriate groups, as required by the relevant regulations and protocol.

Adverse events include an Adverse reaction to the drug (ADR), Unexpected ADR and Serious Adverse Events (SAE).

ADR occurs when there is a reasonable probability that it does NOT have a causal relationship with the tested medical product.

Unexpected ADR occurs when adverse reactions are incompatible with the characteristics of the drug or its corresponding information about the drug.

Serious Adverse Events (SAE) –this is any undesirable medical phenomenon that, in any dosage:

– leads to death,

– poses a threat to life,

– requires inpatient hospitalization or leads to an extension of the current hospitalization period,

– leads to persistent or significant disability/disability,

– this is a congenital anomaly / birth defect.

The researcher must: declare AE/ deviations from normal laboratory tests that are critical to safety indicators, as set out in the protocol, immediately declare all SAE to the sponsor, immediately send detailed written reports on SAE to provide additional information about registered deaths.

Reports of individual cases related to the safety of the drug should not identify the person, but should have a test subject code for identification.

SAE cases are usually jointly stated in a specially developed form. SAE, as a rule, must be notified to the sponsor within 24 hours. If a Data Monitoring Committee (DMC) has been established/The Data Security and Monitoring Council (DSMC), then the researcher must notify them, as a rule, within a week (Hackshow, 2009). This, however, will depend on the study and will be indicated by the committee/council accordingly.

SAEs that pose a threat to life or have led to death and that are unexpected and probably related to the intervention under investigation should be reported to the IEC/ECO, as a rule, within seven calendar days, and other NSAs within 15 days.

According to Hackshaw (2009), «all proposed tests must be reviewed and approved by the IEC. The IEC examines the test report and any documents intended for the test participant, such as the patient's information sheet, consent form and questionnaires».

Independent Ethics Committee (IEC) – An independent body (supervisory board or committee, institutional, regional, national or supranational) consisting of medical specialists and non-medical members whose responsibility is to ensure the protection of the rights, safety and health of people participating in the trial and to provide a public guarantee of this protection by, among other things, reviewing and approving/providing a favorable opinion about the test report, the suitability of the researcher(s), as well as the premises, methods and materials for use in obtaining and documenting the informed consent of test participants.

The Expert Council of the Organization (ECO) is an independent body composed of physicians, scientists and other members whose responsibility is to ensure the protection of the rights, safety and health of people participating in the test, by, among other things, reviewing, approving and ensuring constant supervision of the test protocol and amendments, as well as methods and materials for use in obtaining and documenting the informed consent of the test participants.

The approval of the IEC/ECO should be requested for all procedures that will involve study participants. The study cannot begin until the approval of the IEC/ECO is obtained. After receiving approval, evidence of this should be kept with a clear indication of which documents were submitted for approval. During the tests, the researcher must make sure that all new versions of the approved documents are submitted to the IEC/ECO for consideration. Some IECs/ECOs require annual renewal of approval and a brief report after the end of the test. The researcher must submit an annual report on the study to the IEC/ECO.

An **investigational drug** is a dosage form of an active ingredient or placebo used in a clinical trial, including variants of an already approved

product. The manual of the GCG states that the researcher is responsible for the accountability of the investigated product on the basis used in the study. The researcher may, at the same time, transfer his duties to a qualified pharmacist.

The researcher is responsible for:

keeping records of the studied drugs, which include information about the amount received, distributed and returned/destroyed;

ensuring proper storage conditions and documentation, including information on date, quantity, batch numbers, expiration date;

ensuring the use of the studied drugs only for the purposes provided for by the approved protocol;

maintaining a list of randomized code numbers assigned to participants; explaining the correct use of the studied drugs to participants;

reconciliation of all the studied drugs received.

Chin and Lee (2008) state that "ideally, the protocol should be written so well and anticipate all abnormal situations so that there is no need to change the protocol or any waivers of rights during the research process." "In this case, the interpretability of the study is maximum. However, this happens in rare cases."

The study should be conducted in accordance with the approved protocol, the GCP and applicable regulatory requirements. An agreement on compliance with the protocol must be recorded in a contract or similar document and signed by the researcher/institution and the sponsor. If there is a need to make changes during the study, then it is necessary to request the approval of the same IEC/ECO that approved the first version. With some exceptions, such as when urgent security measures may be required, approval must be obtained before an amendment is made.

According to the GCP, deviation from the protocol is possible when the purpose of such deviation is to eliminate the immediate danger to the participants. If such a deviation is necessary, then the sponsor, the IEC/ECO and, if necessary, the regulatory body should be informed as soon as possible after the event.

Any deviation from the protocol, both within the control of the researcher and outside of it, as well as its causes should be recorded in detail.

The researcher must "have qualifications through education, training and experience in order to take responsibility for the proper implementation of the test, must meet all the qualification requirements specified in the applicable regulatory document, and must provide evidence of such qualifications in the current resume and/or other relevant documentation requested by the sponsor, the IEC/ECO and/or regulatory authorities."

Additionally, the researcher should thoroughly study the protocol and the investigational drug, as prescribed in the Researcher's Brochure, as well as information about the drug and other literature about the drug. In the case of a registered drug, the researcher should familiarize himself with information about the drug, such as Instructions for the use of the drug, as well as what it is usually used for, any contraindications, etc.

Early termination of trials.

Mikhailovich-Madzarevich (2010) emphasizes that "the termination or suspension of the study has many consequences, especially for the safety of the patient." As soon as a decision is made to terminate or suspend the study, all relevant authorities should be notified as a matter of urgency, indicating the reasons for the suspension or termination.

The researcher, after making a decision to terminate or suspend the study, is obliged to: notify all participants immediately and appropriately, for example, by phone, letter, etc. to assess treatment needs and develop a schedule of follow-up measures for all participants to arrange a meeting with each participant individually, if necessary to inform the institution, sponsor, IEC/ECO and other relevant authorities involved and submit a detailed written report, if necessary.

Reports and records.

The researcher's responsibility is to ensure that all records are kept accurately and that all reports are completed and submitted in a timely manner.

Primary data – all information in the original records and certified copies of the original records of the results of clinical trials, observations or other activities within the framework of clinical trials necessary for the reconstruction and evaluation of trials. Primary data is contained in primary documents (original records or certified copies).

Primary documents – Originals of documents, data and records (for example, hospital medical records, medical history, laboratory records, memos, diaries of participants or performance assessment questionnaires, pharmacy journals on the distribution of the drug, recorded data from automatic devices, copies or transcripts certified after confirmation of compliance with the original, microcards, photographic negatives, microfilms or magnetic media, radiographs, charts or records of participants stored in pharmacies, laboratories and medical and technical departments participating in clinical trials).

The researcher must retain sufficient initial data. They should be accurate and state all relevant comments on each of the subjects. The source data must be substantive, readable, timely, original, accurate and complete. Changes to the original data should be tracked and explained, if necessary, and the clarity of the original data should be maintained.

All information required for each test participant, as specified in the protocol, must be recorded in an Individual Registration Card (IRC); usually in the form of a printed, optical or electronic document.

The researcher must keep all the necessary documentation and keep it for the period specified by the sponsor after the completion of the tests. The financial aspects of the study should be documented in a form agreed upon between the sponsor and the researcher.

The researcher must provide generalized results of the research progress to the IEC/ECO annually or on demand. All changes that may significantly affect the testing process or increase the risk to participants should be set out in a written report and provided to the sponsor and the IEC/ECO.

The researcher must submit a final report on the results of the tests to the IEC/ECO and regulatory authorities after their completion. The researcher must also provide the sponsor with all required reports at the end of the test.

GOOD LABORATORY PRACTICE (GLP)

Good Laboratory Practice (GLP) provide regulations and the standard by which drug safety studies are conducted in nonclinical animal studies. In addition to ensuring the ethical treatment and welfare of animals, ad-

hering to GLP regulations gives sound evidence of the validity, integrity, and reliability of nonclinical safety data. This nonclinical safety data will ultimately be submitted to and evaluated by regulatory agencies for approval to use in clinical studies in humans. Principles of GLP promotes the quality and validity of data generated in the testing of chemicals and prevent fraudulent practices.

The principles have been developed in accordance with the Organisation for Economic Cooperation and Development (OECD) and the EU has adopted these principles and the revised OECD Guides for Compliance Monitoring Procedures for GLP as annexes to its two GLP Directives.

History of GLP.

GLP regulations have become an ingrained part of maintaining quality in drug development for many years, however these regulations are younger than one may think. The FDA issued the Guidance for Industry Good Laboratory Practices Regulations in 1978 in response to an observed lack of quality as well as scientific integrity in nonclinical toxicology studies in the mid-1970s.

The most notable instance being a scandal involving Industrial Bio-Test Laboratories in which former executives were accused of providing false data to chemical companies that were then submitted to the government to prove their products were safe. Before the FDA implemented these regulations, New Zealand and Denmark released their own GLP regulations years earlier in 1972.

The Organization for Economic Co-operation and Development (OECD) adopted these principles in 1992 to promote compliance on a larger scale. Both sets of regulations cover a vast array of sectors including:

- General provisions,
- Organization and personnel,
- Facilities and equipment,
- Testing facilities operation,
- Test and control animals,
- Protocol for conduct of a nonclinical laboratory study,
- Records and reports,
- Disqualification of testing facilities.

When is GLP Compliance Required?

Generally, most nonclinical studies will fall under the GLP regulation requirements. However, there are some instances or stages in the early pre-clinical phase where adherence to GLP is not required.

Examples of studies that could be exempt from GLP include exploratory genotoxicity, mutagenicity, safety pharmacology, and general in-vitro toxicology studies. Sponsors may decide to conduct this stage of studies outside of GLP requirements if the goal is solely to investigate preliminary drug safety by analyzing the drug's absorption, distribution, metabolism, and elimination (ADME) properties.

The objective of these studies would be to test the initial tolerability of the drug in various systems. This will then lead to further investigation that is conducted in a study where compliance with GLP is required.

Examples of studies that require GLP compliance include standard repeated dose toxicity, genotoxicity, and safety pharmacology studies. Ultimately, all nonclinical trial results that will be submitted with an IND, must be conducted in accordance with GLP requirements.

GLP and Quality Assurance Unit Requirements.

A vital aspect of GLP regulations is the requirement that the Quality Assurance Unit (QAU) remain independent of operations. GLP Part 58.35 states that the QAU must monitor the conduct of each study to "assure management that all facilities, equipment, personnel, methods, practices, records, and controls are in conformance with the regulations."

The QAU typically conducts an audit for each nonclinical laboratory GLP study. The goal of the audit is to ensure that the GLPs, standard operating procedures (SOPs), and protocols are being followed and that the data summarized in the final report accurately reflect the results of the study.

The QAU audit can include:

- Reviewing the source data against the data imported into the analysis software,
- Confirming that all routine quality control (QC) steps have been performed,
- Reviewing the analysis, tables/listings/figures, and the report against the protocol/amendments, SOPs, and regulatory requirements.

Benefits of CROs for GLP Compliance.

A contract research organization (CRO) can provide subject matter experts in specific processes who can provide different perspectives. Being independent from the sponsor allows CROs to have an unbiased approach as the focus is on the service being provided rather than the success of the drug.

Per the regulations, CROs must be current on their GLPs and any updates as they are released. In order to maintain compliance, CROs can monitor various metrics such as:

- Tracking the number of deviations,
- What they are deviating from as well as the version,
- Who submitted the deviation,
- Planned vs unplanned deviations,
- Deviations per year or quarter.

All of the metrics listed above can help gain a better understanding of why deviations are occurring and how processes can be improved to prevent them. Metrics are a great way to see how the organization is currently doing when it comes to GLP compliance and overall quality and areas where improvements could be made.

GLP underpins the mutual acceptance of test data between countries, which avoids duplicative testing, is beneficial to animal welfare, and reduces costs for industry and governments.

Common principles for GLP also facilitate the exchange of information and prevents the emergence of non-tariff barriers to trade, while contributing to the protection of human health and the environment. Read more on GLP on the OECD Good Laboratory Practice webpage.

International aspects.

The EU has concluded Mutual Recognition Agreements for GLP with Israel, Japan, and Switzerland. The European Regulations and Directives also apply to Iceland, Liechtenstein, and Norway. Following Decision C (97)186/Final of the OECD CouncilEN, data generated in the testing of chemicals in an OECD Member Country, in accordance with OECD Test Guidelines and the principles of GLP, are accepted in other OECD Member Countries (e.g. Australia, Canada, Korea, and the USA). This also applies to certain non-OECD member countries that are full adherents to the mutual acceptance of data (MAD) in accordance with OECD

Council Decision C(97)114/Final (Brazil, India, Malaysia, Singapore and South Africa, as well as Argentina for industrial chemicals, pesicides and biocides only.)

The principles of GLP are applied to the non-clinical safety testing of test items contained in a range of products. The application of GLP is required by a variety of different product-specific legislation.

Conclusions.

In the pharmaceutical industry, GLP regulations are the standard used to assure the quality and integrity of nonclinical drug safety studies conducted in animals.

GLP regulations were first introduced by the FDA in 1978 and have become an integral part of nonclinical drug development. A key component of GLP is an independent quality assurance unit intended to monitor study conduct, analysis, and reporting of nonclinical studies.

Allucent's nonclinical TK analysis and reporting experience covers every route of administration, type of toxicity study, and expertise in complex nonclinical study designs for GLP and non-GLP studies.

SEARCH FOR MEDICAL INFORMATION

Does evidence-based medicine imply only reading and analyzing articles?

Rather, evidence-based medicine is an enhancement of the traditional skills of a clinician by systematizing questions and applying risk/benefit models.

In solving the problems of medical care, it is advisable to follow an evidence-based approach, systematically looking for answers to these questions and changing your clinical practice.

Professor David Sacket formulated the main aspects of evidence-based medicine, which is now known as the stages of the search and application of evidence-based information.

At its core, evidence-based medicine requires not just reading articles, but reading the right articles at the right time, then changing your behavior in accordance with the information received.

Incorrect formulation of questions leads to incorrect search for an-

swers. Nowadays, a very common approach to decision-making based on "cutting out articles", namely, quoting the "Results" section. But is it possible to make such a decision without knowing anything about the methods of obtaining these results? It is necessary to evaluate the type of study conducted, its design, the presence of randomization, control groups, and the number of patients included. Particular emphasis should be placed on how the selection of study participants was carried out, what criteria for inclusion and exclusion, taking into account the purpose of this study [5].

When receiving contradictory, unexpected results, the authors should check and reproduce their results, exclude the possibility of systematic or statistical error.

Speaking about the search for information, first of all, the search for textual information is meant and the main means and methods of working with information and search engines (ISE) and databases (DB) are considered.

There are two main types of ISE: classification and dictionary.

1) In the first case, all the information included in the ISE database (hyperlinks to websites, abstracts, articles, etc.) is distributed by the Web server staff (systematizers) into predefined categories (for example, "Immunology", "Manuals", "Conferences", etc.). The user of such an ISE (for example, Yahoo, Medmatrix) selects the category he is interested in and finds links to documents on this topic there.

2) The dictionary ISE (for example, Altavista, Google, Yandex, Bing) is based on a list of keywords generated by a computer system based on indexed documents, each word is accompanied by a list of documents in which this word occurs, often also indicating the position of the word in the text. The main advantage of dictionary ISEs over classification ones is the ability to search for keywords not only in the titles and annotations of documents included in the database, but also in the content of the documents themselves.

Thus, in order to conduct an effective search, you must first answer the following questions.

1. What is the subject of the search (What?);
2. What are the search problems (Where?);
3. What is the search mechanism (How?).

The correct wording of the question is important.

First, decide which languages you need articles in. Remember that English-language information prevails on the Internet.

Secondly, find the keywords that most accurately reflect your interests, find synonyms, refine the translation using a dictionary. It may be useful to select words by categories, such as «Disease», «Diagnosis», «Treatment», «Observation units».

If you already have articles on the subject you are studying, try to choose keywords from them.

During the search process, you will be able to find more suitable formulations and so-called MeSH terms (Medical Subject Headers – thesaurus of the US National Library of Medicine used for indexing articles in the MEDLINE database) and use them in a search query.

It is better to think in advance about such points as the objects of observation (people and/or animals, men and/or women, age), the time range of publication of articles, the type of articles (review, clinical observation, meta-analysis, etc.).

Thorough study of this stage will give 50% of your success and will save time and money when searching /

Existing information resources on the Internet can be divided into the following types: publishers and journals, databases of annotations and service services that provide simultaneous search for articles on several sites. Among the sites providing access to databases, the undisputed leader is the well-known PubMed MEDLINE.

A simple and convenient technology for searching articles, as well as information in clinical manuals, is presented on the MDConsult website http://www.mdconsult.com .

The search is carried out in several databases simultaneously: MEDLINE, AIDSUNE, CANCERLIT, HealthSTAR. Many of the articles available in full text (published in 1995-2011) are free.

When registering on the site, a 10-day trial period of free access to the site's services is provided. Further access is available for a fee.

Medbioworld Portal http://www.medbioworld.com It is one of the most complete collections of links to sources of professional medical information on the Internet.

This resource contains more than 25,000 links to medical journals,

professional medical associations, medical dictionaries, nosological databases, clinical trials, manuals.

In addition, you can use resources such as TRIP to search for articles (http://www.tripdatabase.com), findarticles.com , the interface of which is the simplest among all of the above search engines and at the same time allows you to get excellent results.

To search for patent information, it is advisable to use the servers of the United States Patent and Trademark Office http://www.uspto.gov , Federal Institute of Industrial Property http://www.fips.ru , European Patent Office http://www.european-patent-office.org .

Scientific electronic library eLibrary.RU is the largest Russian information portal in the field of science, technology, medicine and education, containing abstracts and full texts of more than 12 million scientific articles and publications.

On the eLibrary platform.Electronic versions of more than 1,900 Russian scientific and technical journals are available, including more than 900 open access journals.

To work in the library, you need to register. The rights of free access to the full texts of articles are granted to registered organizations and are limited to certain ranges of IP addresses assigned to each of the registered organizations.

User registration in the Scientific Electronic Library is a prerequisite for obtaining access to the full texts of publications posted on the eLibrary platform.RU, regardless of whether they are publicly available or distributed by subscription.

Registered users also get the opportunity to create personal collections of magazines, articles, save the history of search queries, customize the navigator panel, etc.

On the website of the All-Russian Institute of Scientific and Technical Information of the Russian Academy of Sciences (VINITI) at http://www.viniti.ru detailed information about the work of the institute is presented, including the abstract journal «Medicine», which is a periodical in which abstracts, annotations, bibliographic descriptions of books and articles from journals and collections, materials of scientific conferences, etc. are published. [5].

Special attention should be paid to free online full-text versions of peer-reviewed journals, such as:

– British Medical Journal http://www.bmj.com

– New England Journal of Medicine (http://www.nejm.org)

In addition to these journals, meta-analyses presented on the websites of the Cochrane community are considered to be one of the most reliable sources of information (http://www.cochrane.org),

ASR Journal Club http://www.acpjc.org ,

clinical guidelines of The National Guideline Clearinghouse http://www.guidelines.gov .

Free access to the journals in full-text format is provided through the servers:

– PubMedCentral (http://www.pubmedcentral.nih.gov)

– HighWire Press (http://highwire.stanford.edu)

– Free Medical Journals http://www.freemedicaljournals.com).

The Google Academy service is interesting (http://scholar.google.ru , http://scholar.google.com), which provides quick access to scientific articles on medical (and other topics) located on almost all of the above-mentioned journal sites and databases.

Most of the resources that provide access to medical articles are equipped with two search options:

1) simple (aimed at novice users or used for preliminary acquaintance with the subject of the search and keywords)

2) and advanced (professional).

In the first case, the user is offered a field for entering a query.

In the second there are additional options for specifying the date of publication, the name of the author, the section in which the search will be performed (title, abstract, text of the article), the number of the first page, etc.

If it is necessary to select a large number of articles on a given topic, it is rational to divide the search process into several stages, and each subsequent one should refine the results of the previous one.

Information search rules.

1) Don’t trust random information,

2) Send the search engine different versions of the question (different formulations using keywords or phrases),

3) Use all search engines, various databases and libraries,

4) The search for medical information should begin with reference books and thesauruses (to clarify and check all formulations),

5) Discussion and citation of an article or material is a sign of quality,

6) Pay attention to the author or team of authors, place of work, other printed works, their subject matter,

7) Refer to reputable and verified sources of information,

8) Always check any information (with previous data, dictionaries, databases, etc.).

CRITICISM

Critics call EBM "a fashionable trend coming more from young and self-confident doctors who seek to belittle and criticize the work of experienced clinicians, using epidemiological jargon and manipulating statistics."

There is also a similar opinion: "evidence-based medicine claims that no medical intervention can be performed until the results of several expensive large trials or recommendations approved by experts are published."

It is even believed that "evidence-based medicine seeks to replace the initial data with subjectively selected, arbitrarily generalized and biased conclusions of uncertain reliability and completeness. And it is carried out by people of unknown abilities, experience and skills."

Although in reality, many doctors support evidence-based medicine and its principles, including because they realize that doctors used to sometimes make illiterate decisions until they got acquainted with the methods of evidence-based medicine. After all, current doctors do not prescribe a new drug without having information about its effectiveness and safety.

To treat on the basis of his experience, according to the stories "but I had the same patient, we gave him this drug, and he recovered ..." may be risky for the health of other, similar, but still individual patients. After all, all patients differ in a huge range of characteristics and variables. In addition, a dangerous situation is when a doctor has not seen some rare and serious side effect of the drug in his patients, so he is not afraid to prescribe it and may not foresee potential risks for patients.

Of course, personal clinical professional experience should not be re-

jected and avoided. But decisions should be based on the collective experience of hundreds and thousands of other experienced doctors.

Currently, there is an abundance of reviews, translations, reports, various recommendations, free medical journals and "informational materials", which are often directly or indirectly sponsored by pharmaceutical companies. Is it possible to believe this information? According to Cynthia Mulrow, a professor, one of the founders of the science of systematic reviews, an expert in a certain clinical field is less likely to present an objective systematic review than a non-expert who is open-minded about the literature on a particular topic [5].

The method based on cost minimization is widely used. Of course, it is impossible to proceed only from the cheapest options for diagnosis and treatment, because it is inhumane and even ineffective. But it is impossible to go to the other extreme – to rely entirely on new, expensive, unexplored interventions, since we work in conditions of extremely tight resource constraints. In addition, new expensive methods can turn into unexpected adverse and even dangerous consequences.

Evidence-based medicine, in its essence, takes into account the ongoing changes in modern methods and algorithms in clinical practice, determines the need for a specialist in training, teaches to apply knowledge in new, undescribed clinical situations, develops critical thinking, makes an active and meticulous search for information and evidence, fully checking them.

It is impossible to never allow ignorance. But it is possible to develop comprehensively, both for a doctor and for medical science as a whole. Only in search and analysis will the truth be born.

GLOSSARY SOURCES

AIDSinfo: **Glossary of HIV/AIDS-Related terms 4th Edition.**
CenterWatch, Inc. Patient Resources: Glossary.
ECRI (formerly the Emergency Care Research Institute).
Eli Lilly and Company: Lilly Clinical Trials Glossary.
MediStudy.com Inc: ClinicalTrials: A-Z Glossary.
National Cancer Institute: **Cancer.gov Dictionary.**

EVIDENCE-BASED MEDICINE IN QUESTIONS AND ANSWERS

1. EVIDENCE-BASED MEDICINE IS:

A) + conscientious, accurate and meaningful use of the best results of clinical trials to choose the treatment of a particular patient.

B) generalization and interpretation of laboratory data.

C) independent medical science

D) study of public health.

E) the theoretical basis of Soviet healthcare.

2. THE TERM «EVIDENCE-BASED MEDICINE» (EVM) OR «EVIDENCE-BASED MEDICINE» (NDM) WAS PROPOSED IN:

A) +1990.

B) 1992

C) 1993

D) 1990

E) 1996

3. THE TERM «EVIDENCE-BASED MEDICINE» (EVM) OR «EVIDENCE-BASED MEDICINE» (NDM) HAS BEEN PROPOSED:

+By Canadian scientists

By American scientists

By Japanese scientists

By Russian scientists

By the World Health Organization

4. SPECIFY THE CORRECT DEFINITION OF EVIDENCE-BASED MEDICINE:

A)+ Technology of collection, critical analysis, generalization and interpretation of scientific information

B) Information on the results of clinical trials proving the benefits of the drug;

C) A research method for choosing the treatment of only one patient.

D) Theoretical basis of scientific research.

E) Critical analysis of information.

5. THE RIGHT PREREQUISITES FOR DM:
A) A large amount of information
B) periodic exchange of information
C) Outdated medical knowledge
D) More than 100,000 articles.
E)+ More than 4,000,000 articles per year

6. DECISION-MAKING THAT IS NOT BASED ON THE PRINCIPLES OF EVIDENCE-BASED MEDICINE IS:
A)+ Decision-making based on a short story
B) Decision-making based on scientific approaches
C) Decision-making depending on the disease
D) Making a decision depending on the patient's status
E) Decision-making based on economic costs

7. THE MAIN ASPECT OF DM IS:
A) Critical evaluation of evidence in the health economics.
B) Identification of reasonable information in medicine.
C)+ Critical evaluation of scientific information for reliability and usefulness and identification of reasonable information to answer questions;
D) Identification of the best results of biological research;
E) identification of the best epidemiological results.

8. EVIDENCE-BASED MEDICINE INCLUDES:
A) information retrieval of scientific information
B) technology of collecting information material
C)+ technology for collecting and analyzing scientific information to make the right clinical decision
D) technology of search, collection, analysis of scientific evidence information
E) information for making the right clinical decision

9. CLINICAL TRIALS
A) research in science
B) research in medicine
C)+ the final stage of the clinical trial

D) the stage of clinical research, including the experiment

E) the stage of clinical research, including the collection of scientific information

10. THE CONCEPT OF «EVIDENCE-BASED MEDICINE» WAS INTRODUCED BY UNIVERSITY SCIENTISTS

A) Sorbonne

B) +McMaster

C) Harvard

D) Oxford

E) Cambridge

11. THE UNIVERSITY WHERE THE CONCEPT OF «EVIDENCE-BASED MEDICINE» was INTRODUCED is located in

A) USA

B) +Canada

C) England

D) France

E) Germany

12. BASIC QUESTIONS ARE MOST OFTEN USED BY DOCTORS WITH EXPERIENCE

A)+ small

B) average

C) large

D) minimum

E) long-lasting

13. APPLIED QUESTIONS ARE MOST OFTEN ASKED BY DOCTORS WITH WORK EXPERIENCE

A) small

B) average

C) +large

D) minimal

E) long-lasting

14. THE PICO PRINCIPLE IMPLIES
A) search for scientific information
B) drafting a 2-component question
C) + compilation of a 4-component question
D) critical analysis of scientific information
E) correct formulation of the clinical question

15. 1 STEP IN EVIDENCE-BASED MEDICINE
A) development of practical guidelines
B) writing an article on the chosen topic
C) search for information on the selected topic
D) +formulation of a clinical question
E) application of scientific data in practice

16. STEP 2 OF DM IS
A) study of the state of the issue in world literature
B) + search for scientific information in an electronic database
C) issue of the article
D) choice of treatment method
E) selection of diagnostic methods

17. THE 3RD STEP IN EVIDENCE-BASED MEDICINE IS
A) development of practical guidelines
B) writing an article on the chosen topic
C) search for information on the selected topic
D) formulation of a clinical question
E) +critical analysis of scientific information

18. IN EVIDENCE-BASED MEDICINE, STEP 4 INCLUDES
A) development of practical guidelines
B) writing an article on the chosen topic
C) search for information on the selected topic
D) formulation of a clinical question
E) +application of scientific data in practice

19. ONE OF THE COMPONENTS OF THE APPLIED QUESTION IS

A) + exodus
B) forecast
C) disability
D) medicinal product
E) health improvement

20. MANDATORY COMPONENT OF THE APPLICATION QUESTION

A) A question word
B) +patient or problem
C) modeling the situation
D) medical worker
E) literature

21. CLINICAL OUTCOMES IN CLINICAL EPIDEMIOLOGY INCLUDE

A) risk
B) forecast
C) frequency
D) treatment
E) +disability

22. THE COMPONENTS OF THE CLINICAL QUESTION INCLUDE

A) medicines
B) death
C) +forecast
D) pathological manifestations
E) changes at the morphological level

23. ONE OF THE BASIC PRINCIPLES OF CLINICAL EPIDEMIOLOGY

A) +generalizability
B) qualitative approach
C) individual treatment of the patient

D) development of principles for the treatment of infectious patients
E) development of principles for the treatment of non-infectious patients

24. THE PRINCIPLES OF CLINICAL EPIDEMIOLOGY INCLUDE
A) + reliability
B) proper treatment
C) internal structure
D) reference point for the process
E) application of health standards

25. THE QUANTITATIVE APPROACH REFERS TO
A) +Principles of Clinical Epidemiology
B) Tasks of clinical epidemiology
C) Principles of evidence-based medicine
D) The tasks of evidence-based medicine
E) Outcomes in clinical epidemiology

26. INTERNAL VALIDITY IS
A) + Reliability
B) Generalizability
C) Evidence
D) Popularization
E) Evaluation of results

27. GENERALIZABILITY REFERS TO
A) +External characteristics of the sample
B) Internal characteristics of the sample
C) Qualitative indicators
D) External characteristics of the population
E) Internal characteristics of the population

28. THE FREQUENCY OF THE DISEASE REFERS TO
A) Clinical outcomes
B) +Clinical issues
C) General medical issues

D) Aspects of clinical epidemiology
E) Aspects of evidence-based medicine

29. DISABILITY REFERS TO
A) Aspects of clinical epidemiology
B) Clinical issues
C) General medical issues
D) +Clinical outcomes
E) Aspects of evidence-based medicine

30. DIAGNOSIS MEANS
A) + How accurate are the methods used to diagnose the disease?
B) How common is this disease?
C) What factors are associated with an increased risk of the disease?
D) How will the prognosis of the disease change during treatment?
E) What factors lead to the disease?

31. COST MEANS
A) + How much does the treatment of this disease cost?
B) How common is the disease?
C) Are the methods used to diagnose the disease accurate?
D) How common is the disease?
E) What factors lead to the disease?

32. THE QUESTION «What factors are associated with an increased risk of disease?» REFERS TO
A) +Risk
B) The disease
C) Outcomes
D) Diagnosis
E) Treatment

33. THE QUESTION «What are the consequences of the disease?» REFERS TO
A) Questions
B) Clinical outcomes

C) +Forecast
D) Diagnostics
E) Methods of treatment

34. INABILITY TO PERFORM NORMAL ACTIVITIES AT HOME, AT WORK, DURING REST – THIS REFERS TO
A) +The concept of disability
B) The concept of disease
C) The concept of discomfort
D) The concept of dissatisfaction
D The concept of recovery

35. DISSATISFACTION IS
A) +Emotional reaction to the disease and the treatment
B) Inability to perform normal activities
C) Reaction to treatment
D) The protective reaction of the body
E) Bad outcome

36. CLINICAL EPIDEMIOLOGY HAS THE PRINCIPLE OF
A) + focus on clinical outcomes
B) structures of the clinical task
C) Question structures
D) clinical approach
E) performance

37. CLINICAL EPIDEMIOLOGY IS
A) + science that develops methods of clinical research that make it possible to make fair conclusions, controlling the impact of systematic and random errors
B) Science that develops research methods that make it possible to make fair conclusions
C) Science that develops research, controls the impact of systematic and random errors
D) science developing research by controlling the impact of errors
E) the science of clinical research

38. ONE OF THE DEFINITIONS OF CLINICAL EPIDEMIOLOGY INCLUDES THE FOLLOWING CONCEPT

A) + science that allows forecasting for each individual patient based on the study of the clinical course of the disease in similar cases using rigorous scientific methods of studying groups of patients to ensure the accuracy of forecasts

B) science that allows forecasting for each individual patient

C) science, based on the study of the clinical course of the disease, ensures the accuracy of forecasts

D) science using rigorous scientific methods of studying groups of patients to ensure the accuracy of forecasts

E) science using rigorous scientific methods

39. THE SEARCH FOR INFORMATION ON EVIDENCE-BASED MEDICINE BEGINS WITH

A) printing of the article

B) +database definitions

C) copying

D) reading the article

E) viewing a resume

40. THE PURPOSE OF CLINICAL EPIDEMIOLOGY

A) +development and application of such methods of clinical observation that make it possible to make fair conclusions, avoiding the influence of systematic and accidental errors

B) development of clinical observation, which makes it possible to draw conclusions

C) the use of clinical observation methods, which makes it possible to avoid systematic and accidental errors

D) the ability to make fair conclusions, avoiding the influence of systematic and accidental errors

E) development and application of observation methods

41. ONE OF THE COMPONENTS OF THE GOAL OF CLINICAL EPIDEMIOLOGY

A) modification of clinical observation

B) approbation of clinical observation

C) +development and application of clinical observation methods

D) development of clinical observation

E) fairness of clinical observation

42. SPECIFY THE MOST COMPLETE DEFINITION OF THE PURPOSE OF CLINICAL EPIDEMIOLOGY

A) +development and application of clinical observation methods that promote fair conclusions and avoid systematic and accidental errors

B) the introduction of methods of clinical observation and data analysis, ensuring the right decisions;

C) introduction of statistical observation methods

D) introduction of methods of proof of reliable data;

E) making the right decisions.

43. ONE OF THE MAIN PROVISIONS OF CLINICAL EPIDEMIOLOGY IS

A) +in most cases, the diagnosis, prognosis and treatment results for a particular patient are not unambiguously determined and therefore must be expressed in terms of probabilities;

B) probabilities for a particular patient are poorly evaluated;

C) the results are not subject to systematic errors leading to incorrect conclusions;

D) Any observations, including clinical ones, are not affected by chance;

E) To get conclusions, doctors should rely on their experience

44. THE EFFECTIVENESS OF THE INTERVENTION IS PROVEN IF

A) + the effectiveness of the intervention has been convincingly proven; at the same time, the expected harm is small compared to the benefit;

B) the effectiveness of the intervention has been inconclusively proven; at the same time, the expected harm is high compared to the benefit;

C) the effectiveness of the intervention has not been convincingly proven;

D) the effectiveness of the intervention has been convincingly proven;

E) the effectiveness of the intervention has been proven; at the same time, the harm is not comparable with the benefit

45. THE EFFECTIVENESS OF THE INTERVENTION IS ASSUMED IF

A) +the effectiveness of the intervention has been proven less convincingly,

B) the effectiveness of the intervention has been proven,

C) the effectiveness of the intervention has not been proven

D) the ineffectiveness of the intervention has been proven

E) the effect of the intervention has been proven

46. IF THE ADVANTAGES AND DISADVANTAGES OF THE INTERVENTION ARE COMPARABLE, THEN

A) + before using such interventions, the doctor and the patient should weigh the ratio of the expected benefits and harms, taking into account the specific situation;

B) before using such interventions, the doctor should weigh the ratio of expected benefits and harm;

C) before using such interventions, the doctor should weigh the ratio of the expected benefits and harms, taking into account the specific situation;

D) before using such interventions, the patient should weigh the ratio of the expected benefits and harms, taking into account the specific situation;

E) before using such interventions, the patient should weigh the ratio of expected benefits and harm;

47. THE EFFECTIVENESS OF THE INTERVENTION HAS NOT BEEN ESTABLISHED IF

A) + there is not enough evidence of effectiveness, or they are not completely reliable;

B) there is insufficient evidence of effectiveness

C) the evidence is not completely reliable

D) effectiveness has not been proven

E) there is no efficiency

48. THE EFFECTIVENESS OF THE INTERVENTION IS UNLIKELY

A) +evidence of ineffective intervention is less convincing,

B) the evidence of the ineffectiveness of the intervention is convincing,

C) the evidence for the effectiveness of the intervention is less convincing,

D) the evidence for the effectiveness of the intervention is not convincing,

E) the effectiveness of the intervention is less convincing

49. IF INEFFICIENCY OR HARM IS PROVEN, THEN THESE ARE INTERVENTIONS WHOSE INEFFICIENCY OR HARM

A) + Convincingly proven

B) Proven

C) Not proven

D) Proved unconvincingly

E) No efficiency

50. AN EXAMPLE OF UNREASONABLE APPROACHES TO THE USE OF COMMON MEDICINES

A) + The use of antimicrobial agents for acute respiratory viral infections;

B) Cosmetology medicine.

C) Embalming of corpses.

D) traditional medicine;

E) Oriental medicine

51. UNIVERSAL DATABASE OF THE FIRST GENERATION

A) Google

B) +Yahoo

C) BMJ

D) Cochrane lib.

E) Pubmed

52. SECOND GENERATION SEARCH ENGINE
A) +Direct Hit
B) Yandex
C) CM.ru
D) Altavista
E) Euroseek

53. RUSSIAN-LANGUAGE SEARCH ENGINE
A) Inference
B) Oingo
C) +Rambler
D) Lycos
E) HotBot

54. THE USE OF META-SEARCH IS ASSUMED IF
A) +Other search engines don't find anything
B) The topic is clearly formulated
C) The search prescription is complex
D) It is necessary to obtain a large number of relevant results
E) There are no studies on this topic

55. MEDICAL SEARCH ENGINES INCLUDE
A) +Medical World Search
B) Clinical Review
C) Russian server
D) Medical server
E) Geotar

56. THE RUSSIAN MEDICAL SERVER IS
A) +Medical Search Engine
B) Medical Library
C) Electronic library
D) Public organization
E) Medical organization

57. APORT REFERS TO
A) second-generation search engines

B) first-generation search engines
C) meta search engines
D) +Russian-language search engines
E) universal sites

58. YAHOO REFERS TO
A) second-generation sites
B) + universal sites of the first generation
C) meta search sites
D) Russian-language websites
E) medical websites

59. THEMATIC CATALOGS INCLUDE
A) +Yahoo Health
B) Medline
C) Pubmed
D) Russian medical server
E) Website of the World Health Organization

60. MARTINEDALE HEALTH SCIENCE REFERS TO
A) +Thematic catalogs
B) Electronic libraries
C) Libraries
D) Universal sites
E) Servers

61. ELECTRONIC LIBRARIES CONTAINING SCIENTIFIC EVIDENCE LITERATURE INCLUDE
A) +Pubmed
B) KazNMU Library
C) Russian Library
D) Kazakh National Library
E) Russian medical server

62. THE COCHRANE LIBRARY BELONGS TO THE CATEGORY
A) +Electronic libraries
B) Evidence-based medicine websites

C) The Russian Library
D) Universal sites
E) Websites of the World Health Organization

63. THE COCHRANE LIBRARY WAS CREATED BY
A) V.V. Vlasov
B) +Cochrane collaboration
C) International associations
D) World Health Organization
E) Harvard University

64. ARCHIE COCHRAN FIRST CREATED
A) +Systematic review
B) Meta-analysis
C) Randomized controlled trial
D) Cohort study
E) Library

65. WHAT APPLIES TO ELECTRONIC SEARCH TOOLS
A) +Electronic versions of journals
B) Libraries
C) Books
D) Reports
E) Conference materials

66. MEDLINE IS
A) +Bibliographic database
B) Library
C) The magazine
D) Electronic version of the journal
E) Collection of recommendations

67 ONE OF THE ELECTRONIC SEARCH TOOLS IS
A) Libraries
B) Books
C) Collection of recommendations

D) Conference materials
E) +Thematic catalogs

68. WHEN SEARCHING FOR INFORMATION IN ELECTRONIC DATABASES, LIMITS ARE USED FOR
A) Search deepening
B) Search extensions
C) +Targeted search
D) Increasing the amount of information received
E) To facilitate the search

69. THE ADVANTAGES OF MEDLINE INCLUDE
A) +Speed of data search and copying
B) Search in Russian
C) Availability of information on all topics (medical and non-medical)
D) Many books
E) Availability of recommendations for students

70. FROM WHAT PERIOD CAN I FIND INFORMATION IN MEDLINE
A) Since the 50s
B) +Since the 70s
C) Since the 80s
D) Since the 90s
E) Since 2000

71. USING THE "OR" OPERATOR
A) +Expands the search
B) Narrows the search
C) Defines the search
D) Aligns the search
E). Changes the search

72. THE "NOT" OPERATOR IS USED FOR
A) +Search narrowing
B) Search extensions

C) Search Changes
D) Determination of the search trajectory
E) Search highlighting

73. WHAT ARE SPECIALIZED SITES
A) Sites containing information on certain categories
B) +Sites containing information on medicine in general and its individual sections
C) Sites containing information about evidence-based medicine
D) Websites containing information on surgery
E) Websites containing information on therapy and surgery

74. SPECIALIZED SITES INCLUDE SITES CONTAINING INFORMATION
A) Only for certain sections of health care
B) General health information
C) Selective information on evidence-based medicine
D) Popular scientific information about health
E) +Information on medicine and individual sections

75. SPECIALIZED SITES ON EBM
A) +National Guidelines Clearinghouse
B) British medical journal
C) Medical server
D) Russian electronic website
E) International electronic website

76. ELECTRONIC JOURNALS INCLUDE
A) +The Lancet
B) The Population
C) Website of the Society of DM Specialists
D) Consilium Medicum
E) Health Bulletin

77. NAME THE SOURCES OF SCIENTIFIC EVIDENCE
A) +DARE, MEDLINE Sites
B) Archival sources

C) Statistical indicators
D) Legislative materials
E) Economic materials

78. THE BASIC CLINICAL QUESTION CONTAINS
A) 1 component
B) +2 components
C) 3 components
D) 4 components
E) 5 components

79. THE APPLICATION QUESTION CONTAINS
A) Only two components
B) One component
C) +A certain number of components
D) Does not contain any components
D) Different quantity depending on the problem

80. A CLINICAL TRIAL IS
A) the method of conducting medical interventions in the intervention group
B) the method of conducting medical interventions in the intervention group or in the comparison group
C) a retrospective study in which patients are included in the intervention group to determine the causal relationships between medical intervention and clinical outcome
D) +the final stage of a clinical trial in which the truth of new theoretical knowledge is verified
E) a special type of observational study, where the outcome of therapeutic intervention acts as the studied prognostic factor.

81. The DESIGN OF CLINICAL TRIALS is
A) the method of conducting medical interventions in the intervention group
B) the method of conducting medical interventions in the intervention group or in the comparison group

C) the method of conducting medical interventions in the comparison group

D) + the method of conducting scientific research in the clinic, i.e. its organization or architecture

E) the method of conducting an experimental study.

82. The TYPE OF CLINICAL TRIAL DESIGN IS

A) certain typical clinical tasks

B) + a set of classification features

C) appointment of treatment

D) carrying out preventive measures

E) recruitment of a group of patients for clinical trials.

83. The type of design as a set of classification features correspond to

A) +Certain typical clinical tasks

B) Diagnostic methods

C) Forecasting methods

D) Methods of prevention

E) Cost calculation methods

84. METHODS OF STATISTICAL PROCESSING OF RESULTS RELATE TO

A) +a set of classification features of the clinical trial design

B) clinical trial

C) clinical task

D) medical procedure

E) signs of data correction

85. RESEARCH METHODS IN A CLINICAL TRIAL MUST COMPLY WITH

A) +a set of classification features of a specific design of a clinical trial

B) a set of signs of a clinical trial

C) the list of medical research

D) Statistical research

E) Scientific research

86. A STUDY IN WHICH GROUPS OF PATIENTS ARE DESCRIBED AND OBSERVED ACCORDING TO CERTAIN CHARACTERISTICS, AND THE RESEARCHER COLLECTS DATA BY OBSERVATION, WITHOUT ACTIVELY INTERFERING WITH THEM, IS CALLED

A) +Observational
B) Experimental
C) Quasi-experimental
D) Scientific
E) Transverse

87. THE CRITERION OF OBSERVATIONAL RESEARCH IS THAT THE RESEARCHER

A) +observes events without actively interfering in them
B) actively intervenes in events
C) describes events by actively intervening in them
D) actively changes events
E) experiments and creates various models of the course of the disease

88. IF ONE OR MORE GROUPS OF PATIENTS ARE DESCRIBED AND OBSERVED ACCORDING TO CERTAIN CHARACTERISTICS, THEN THIS IS –

A) +Observational study
B) Experimental research
C) Mathematical research
D) Statistical research
E) Predictive research

89. STUDIES IN WHICH THE RESULTS OF THE INTERVENTION ARE EVALUATED AND THE SUBJECT OF THE STUDY IS OBSERVED, REFERS TO

A) + Experimental research
B) Observational research
C) Modeling methods
D) Methods of statistical processing of the material
E) Forecasting methods

90. THE SUBJECT OF THE STUDY IS OBSERVED IN RESEARCH
A) Experimental and observational
B) Only observational
C) Observational and predictive
D) + Only in experimental
E) Experimental, predictive and observational

91. HOW MANY GROUPS OF PATIENTS USUALLY PARTICIPATE IN EXPERIMENTAL STUDIES
A) A lot
B) Little
C) +One, two or more
D) Ten
E) None

92. WHAT CAN RELATE TO THE RESULTS OF THE INTERVENTION DURING THE EXPERIMENTAL STUDY
A) +Drug, procedure, treatment
B) The patient
C) Research documents
D) Research design
E) Research Center

93. THE CASE REPORT REFERS TO
A) +Descriptive research
B) Analytical research
C) Experimental research
D) Quasi-experimental research
E) Longitudinal studies

94. THE REPORT OF A SERIES OF CASES RELATES TO RESEARCH
A) +Descriptive observational
B) Experimental
C) Analytical observational
D) Longitudinal
E) Slice

95. CASE-CONTROL IS
A) Research
B) Analytical research
C) +Analytical observational study
D) Descriptive observational study
E) Descriptive research

96. A COHORT STUDY IS
A) Experimental study
B) Observational research
C) Descriptive research
D) +Analytical research
E) Medical research

97. EXPERIMENTAL STUDIES INCLUDE STUDIES IN WHICH
A) +Clinical trials
B) Mathematical tests
C) Statistical tests
D) Experimental tests
E) Quasi-experimental tests

98. THE CORRECT CHOICE OF CRITERIA FOR THE OUTCOME OF THE DISEASE UNDER THE INFLUENCE OF TREATMENT AND WITHOUT IT REFERS TO
A) + Requirements for medical research
B) The list of documentation
C) Statistical documentation
D) Mathematical requirements
E) Requirements for statistical processing of research results

99. THE CORRECT USE OF STATISTICAL PROCESSING METHODS IS A REQUIREMENT FOR
A) +Medical research
B) Mathematical research
C) Operational tests

D) Therapeutic trials
E) Drug trials

100. THE MOST IMPORTANT REQUIREMENTS FOR MEDICAL RESEARCH ARE
A) +Location and duration of the study
B) Randomization method
C) Material interest of the study participants
D) Mandatory consent of relatives
E) Availability of insurance

101. CLASSICAL CLINICAL RESEARCH INCLUDES STUDIES
A) Controlled
B) Uncontrolled
C) +Controlled and uncontrolled
D) Observed
E) Unobservable

102. CONTROLLED CLINICAL TRIALS RELATE TO
A) + classical clinical studies
B) research
C) quasi-experiments
D) descriptions
E) observations

103. UNCONTROLLED CLINICAL TRIALS ARE AN EXAMPLE
A) +clinical trials
B) randomized controlled trial
C) Systematic review
D) Meta-analysis
E) Representativeness

104. COMPARISON OF A DRUG OR PROCEDURES WITH OTHER DRUGS OR PROCEDURES REFERS TO
A) +Controlled studies
B) Uncontrolled research

C) Visibility of the experimental group
D) Typicality of the experimental group
E) Atypicity of the experimental group

105. THE PROBABILITY OF DETECTING DIFFERENCES IN TREATMENT IS GREATER IN STUDIES
A) uncontrolled
B) +controlled
In) case-control
D) cohort
E) comparison of procedures

106. THE EXPERIENCE OF USING THE DRUG, WITHOUT COMPARISON WITH ANOTHER TREATMENT OPTION, REFERS TO
A) Conducted controlled studies
B) +Conducted uncontrolled research
C) Conducted randomized controlled trials
D) Ongoing system reviews
E) Ongoing meta-analyses

107. PROCEDURES, WITHOUT COMPARISON WITH ANOTHER TREATMENT OPTION, ARE USED WHEN
A) cohort trials
B) + studies of uncontrolled
C) case reports
D) Description
E) controlled studies

108. THE PROBABILITY OF CARRYING OUT PROCEDURES FOR COMPARISON IS GREATER THAN FOR COMPARING THE DRUG DURING
A) +Clinical uncontrolled study
B) A clinical controlled trial
C) Clinical description of the case
D) Properly prescribed treatment
E) Correct diagnostic test

109. THE MAIN CATEGORIES OF CLINICAL ISSUES INCLUDE
A) Organization of clinical trials
B) +Prevalence of diseases
C) Visits to interest clubs
D) Participation in lectures on the following topics
E) Participation in focus groups

110. TYPICAL CLINICAL ISSUES THAT A DOCTOR FACES WHEN HELPING A PATIENT INCLUDE
A) + healthy or ill
B) acquaintance of the patient with medicines
C) the method of stratification
D) participation in the survey
E) attending lectures given by specialist doctors.

111. RISK FACTORS RELATE TO
A) conducting mass sports events
B) changes in the functioning of a medical organization
C) financing of the healthcare system
D) + to typical clinical questions
E) in conducting an audit in a medical organization.

112. MAKING A CORRECT DIAGNOSIS REFERS TO
A) the method of stratification
B) the audit method
C) the outcome of the disease
D) + clinical question
E) observational research.

113. PREDICTING THE COURSE OF THE DISEASE IS
A) a study in which patients are observed according to certain characteristics
B) studies where the studied factor is a literary review
C) the subject of the study is observed
D) a specially planned comparative study
E) + one of the categories of clinical questions.

114. THE EFFECTIVENESS OF TREATMENT IS

A) evaluation of the results of previous interventions

B) specially planned research

C) research conducted on certain characteristics

D) a special type of forecast research

E) + category of clinical questions.

115. THE REQUIREMENTS FOR CONDUCTING CLINICAL TRIALS INCLUDE

A) + correct organization (design) of the study and a mathematically sound method of randomization

B) management of medical organizations

C) organization of a free grocery cart

D) participation in an experiment to control the quality of work performance

E) selection of the auditor.

116. CLEARLY DEFINED AND OBSERVED CRITERIA FOR INCLUSION IN THE STUDY RELATE TO

A) + requirements for conducting clinical trials

B) the probability of detecting the outcomes of the disease

C) compared with another treatment option

D) less common studies

E) conducting procedures for comparison.

117. CORRECTLY IDENTIFIED AND OBSERVED EXCLUSION CRITERIA FROM THE STUDY RELATE TO

A) compared with other ongoing procedures

B) identification of differences in treatment

C) + clinical trials and their requirements for conducting

D) studies that are less common

E) comparisons of scientific sources.

118. THE CORRECT CHOICE OF CRITERIA FOR THE OUTCOME OF THE DISEASE UNDER THE INFLUENCE OF TREATMENT AND WITHOUT IT IS

A) initial data of the onset of the disease

B) procedures carried out in comparison
C) + studies related to clinical
D) clinical practice guidelines
E) Latin square

119. CONDUCTING CLINICAL TRIALS IMPLIES
A) Delivery of the diagnosis
B) + Location of the study
C) The frequency of occurrence of this disease
D) Increased risk of disease
E) Consequences of the disease in the family

120. THE DURATION OF THE DISEASE REFERS TO THE REQUIREMENTS
A) + Requirements for medical research
B) Search for the most common diseases
C) The diagnosis
D) Associated with an increased risk of disease
E) Related to the consequences of diseases

121. THE CORRECT USE OF STATISTICAL PROCESSING METHODS IS
A) Determining whether the patient is healthy
B) Determining whether the patient is ill
C) Risk factors
D) + Important requirements for medical research
E) Prognosis of the disease

122. INDICATE WHICH OF THE FOLLOWING QUESTIONS IS POSED CORRECTLY WHEN IDENTIFYING THE FREQUENCY OF THE DISEASE
A) What methods of disease prevention do you know?
B) What factors are associated with this disease?
C) + How common is this disease?
D) What factors improve the course of the disease?
E) What are the pronounced consequences of the disease?

123. WHICH OF THE FOLLOWING QUESTIONS IS CORRECTLY POSED IN THE PROGNOSIS OF THE DISEASE

A) How do you assess the patient's health?

B) What are the consequences of treating the disease?

C) How common is this disease and its consequences?

D) + What are the consequences of the disease?

E) What factors are associated with the consequences of the disease?

124. WHICH OF THE QUESTIONS IS CORRECTLY POSED IN THE TREATMENT OF THE PATIENT:

A) Is the patient healthy or sick after treatment?

B)+ How will the course of the disease change during treatment?

C) How common is this disease?

D) What are the consequences of the disease?

E) What factors are associated with an increased risk of the disease?

125. WHICH OF THESE QUESTIONS IS CORRECTLY POSED WHEN IDENTIFYING THE CAUSE OF THE DISEASE:

A) + What factors lead to the disease?

B) Are there methods of preventing the disease in healthy people?

C) Does the course of the disease improve with its early recognition and treatment?

D) What are the consequences of the disease?

E) What factors are associated with an increased risk of the disease?

126. WHAT IS THE TYPE OF RESEARCH?

A) Literature review

B) +Meta-analysis

C) Filling out the medical history

D) Report on the problem posed

E) The effectiveness of treatment.

127. SYSTEMATIC REVIEWS ARE

A) + scientific work, where the object of research is the results of a number of original studies on one problem, the results of research are analyzed using approaches that reduce the possibility of systematic and accidental errors

B) the top of the proofs
C) medical assessment of clinical efficacy
D) method of forming groups of test participants
E) summary statistical indicators.

128. THE PURPOSE OF THE SYSTEMATIC REVIEW IS
A) a quantitative systematic review of the literature to obtain summary statistical indicators
B) consideration of the results of original research on one problem
C) science, which is a universally recognized standard of scientific research
D) the method used to form the sequence of assignment of test participants to groups
E) + a balanced and impartial study of the results of previously conducted studies.

129. A QUALITATIVE SYSTEMATIC REVIEW IS
A) quantitative synthesis of primary data to obtain summary statistical indicators
B) serious scientific research
C) clinical science, which is a generally recognized standard of scientific research for evaluating clinical effectiveness
D) the method used to form a sequence of random assignment of test participants to groups
E) consideration of the results of original research on a single problem or system, but no statistical analysis is carried out.

130. META-ANALYSIS IS
A) +Quantitative systematic review of the literature or quantitative synthesis of primary data to obtain summary statistical indicators
B) Quantitative assessment of the total effect established on the basis of the results of all scientific research
C) Medical science, which is a generally recognized standard of scientific research for evaluating clinical effectiveness
D) The method used to form a sequence of random assignment of test participants to groups
E) Consideration of the results of original research on a single problem or system, but no statistical analysis is carried out.

131. RANDOMIZED CONTROLLED TRIALS (RCTs) ARE

A) quantitative systematic review of the literature or quantitative synthesis of primary data to obtain summary statistical indicators

B) the pinnacle of evidence and serious scientific research: a quantitative assessment of the total effect established on the basis of the results of all scientific research

C) modern medical science, which is a universally recognized standard of scientific research for assessing clinical effectiveness

D) the method used to form a sequence of random assignment of test participants to groups

E) + the «gold standard» is a generally recognized standard of scientific research for evaluating clinical effectiveness.

132. SPECIFY HOW MANY GROUPS OF PATIENTS SHOULD BE IN RANDOMIZED CONTROLLED TRIALS

A) Group 1

B)+ 2 groups

C) 3 groups

D) 4 groups

E) 5 groups.

133. THE CONTROL GROUP IN RANDOMIZED CONTROLLED TRIALS IS

A)+ a group where treatment is not carried out or standard, traditional (usual) or patients receive a placebo

B) the group where the treatment is carried out, the effectiveness of which is proven

C) a group of patients where there are «big» complications

D) a group of patients where repeated hospitalization is observed

E) a group of patients who are absolutely healthy.

134. THE ACTIVE TREATMENT GROUP IN RANDOMIZED CONTROLLED TRIALS IS

A) a group of patients where treatment is not carried out or standard, traditional (conventional) or patients receive a placebo

B)+ a group of patients where treatment is being carried out, the effectiveness of which is being investigated

C) a group of patients who are absolutely healthy

D) a group of patients where there are «big» complications

E) a group of patients where repeated hospitalization is observed

135. A PLACEBO IS

A) a drug that is effective relative to the studied indicator (a «gold standard» drug is more often used – a well-studied, long-standing and widely used in practice)

B) + is an indifferent substance (procedure) used to compare its effects with the effects of a real medicine or other intervention

C) clinical features of the disease and concomitant pathology

D) patient groups should be comparable and homogeneous

E) age, gender, race

136. ACTIVE CONTROL IS

A) + a drug that is effective relative to the studied indicator (a «gold standard» drug is more often used – a well-studied, long-standing and widely used in practice)

B) it is an indifferent substance (procedure) used to compare its effects with the effects of a real medicine or other intervention

C) clinical features of the disease and concomitant pathology

D) patient groups should be comparable and homogeneous

E) age, gender, race.

137. SPECIFY ON WHAT GROUNDS THE HOMOGENEITY OF GROUPS SHOULD BE DETERMINED.

A) groups of patients should be comparable and homogeneous with healthy people

B)+ groups of patients should be comparable and homogeneous in concomitant pathologies

C) groups of patients should be comparable and homogeneous in kinship

D) groups of patients should be comparable and homogeneous in their place of residence

E) patient groups should be comparable and homogeneous by area of residence.

138. THE REPRESENTATIVENESS OF GROUPS IS

A)+ the number of patients in each group should be sufficient to obtain statistically reliable results

B) the distribution of patients into groups should occur at the request of the participants of the experiment

C) groups of patients should be comparable and homogeneous in concomitant pathologies

D) groups of patients should be comparable and homogeneous in age

E) groups of patients should be comparable and homogeneous by gender

139. SPECIFY HOW MANY TYPES OF GROUP REPRESENTATIVENESS THERE ARE.

A) 1

B) 2+

C) 3

D) 4

E) 5

140. QUANTITATIVE REPRESENTATIVENESS IS

A) + denotes the structural correspondence of the sample and the general population.

B) the number of patients in each group should be sufficient to obtain statistically reliable results

C) is determined by the number of observations that guarantees the receipt of statistically reliable data

D) distribution of patients into groups by random sampling

E) the procedure used to compare the effects of medicines

141. THE TRUE CRITERIA FOR THE EFFECTIVENESS OF TREATMENT ARE

A) development of national clinical guidelines

B) selection of the required number of participants in the experiment

C) + the main indicators related to the patient's vital activity

D) the process of including participants in the experiment

E) the process of excluding participants from the experiment

142. THE TRUE CRITERIA FOR THE EFFECTIVENESS OF TREATMENT INCLUDE

A) a sufficient number of patients to obtain statistically reliable results

B) structural correspondence of the sample and the general population

C) minimizing the possibility of influencing the results of the study by its participants

D) open clinical trial

E)+ improving the quality of life, reducing the frequency of complications, relieving the symptoms of the disease

143. ONE OF THE TRUE CRITERIA FOR THE EFFECTIVENESS OF TREATMENT IS

A) the method of simple «blinding»

B)+ results of laboratory and instrumental studies that are related to the true endpoints of treatment

C) a method that ensures the proportional distribution of subjects into groups

D) minimizing the possibility of influence on the results of the study by its organizers

E) structural compliance with the general population

144. RANDOMIZED CLINICAL TRIALS SHOULD USE END-RESULT CRITERIA

A) + objectivity

B) representativeness

C) subjectivity

D) competence

E) humanity

145. A SIMPLE «BLIND» METHOD IS

A) + belonging to a certain group, the patient does not know, but the doctor knows

B) the patient and the doctor do not know whether they belong to a certain group

C) a method that ensures the proportional distribution of subjects into groups

D) a method of minimizing the conscious or unconscious possibility of influencing the results of the study by its participants

E) belonging to a certain group, the patient, the doctor and the organizers do not know (statistical processing).

146. THE DOUBLE «BLIND» METHOD IS

A) the method of belonging to a certain group, where the patient does not know, but the doctor does

B) + the method of belonging to a certain group, where neither the patient nor the doctor know

C) a method that ensures the proportional distribution of subjects into groups

D) the method of minimizing the conscious possibility of influencing the results of the study by its participants

E) neither the patient nor the doctor and the organizers know the method of belonging to a certain group.

147. THE TRIPLE «BLIND» METHOD IS

A) the method of «blinding», where the patient does not know about belonging to a certain group, but the doctor does

B) the method of «blinding», where the patient and the doctor do not know about belonging to a certain group

C) a method of «blinding» that ensures a proportional distribution of patients into groups, taking into account factors affecting the results of treatment

D) the method of minimizing the unconscious possibility of influencing the results of the study by the participants

E)+ the «blinding» method, where the patient, the doctor and the organizers do not know about belonging to a certain group (statistical processing).

148. THE METHOD OF OPEN RESEARCH IS

A) the method of simple «blinding», i.e. the patient does not know about belonging to a certain group, but the doctor does

B) the method of double «blinding», i.e. the patient and the doctor do not know about belonging to a certain group

C) a method that ensures a proportional distribution of subjects into groups, taking into account factors that significantly affect the results of treatment

D) the method of minimizing the conscious or unconscious possibility of influencing the results of the study by its participants

E) +all study participants are aware of the clinical trial.

149. WHAT PERCENTAGE OF PATIENT REFUSALS TO CONTINUE PARTICIPATING IN RANDOMIZED CLINICAL TRIALS ARE CONSIDERED SIGNIFICANT AND INFORMATIVE

A) ≤ 5%

B) ≥ 5%

C) +<10%

D) >10%

E) ≤10%

150. WHAT IS THE PERIOD OF OBSERVATION OF PATIENTS IN RANDOMIZED CLINICAL TRIALS THAT ENSURES THE SIGNIFICANCE AND INFORMATIVENESS OF THE EXPERIMENT

A) with a short observation period

B) for a short period of observation

C)+ with a sufficiently long period of observation

D) there is no need for a period of observation

E) this item is not included in the design of the experiment

151. WHAT LEVEL CORRESPONDS TO THE TRUE CRITERIA FOR THE EFFECTIVENESS OF TREATMENT.

A) zero level

B)+ secondary level

C) quaternary level

D) the fifth level

E) sixth level

152. OBJECTIVE CRITERIA FOR FINAL RESULTS IN RANDOMIZED CLINICAL TRIALS INCLUDE

A) indicator in the general population

B) indicators related to the patient's vital activity

C) results of laboratory and instrumental studies,
D) determination of the desired factors in the exposed group
E)+ mortality from this disease

153. OBJECTIVE CRITERIA OF FINAL RESULTS IN RANDOMIZED CLINICAL TRIALS ARE
A) reducing the frequency of complications
B) relief of symptoms of the disease
C) +total mortality
D) planned life expectancy
E) minimizing the possibility of influencing the results of the study by the participants

154. IN RANDOMIZED CLINICAL TRIALS, OBJECTIVE CRITERIA OF FINAL RESULTS ARE USED:
A) the law of large numbers
B) increase in life expectancy
C)+ the frequency of «big» complications
D) using the random sampling method
E) using the «blinding» method

155. WHICH OF THE CRITERIA RELATES TO THE FINAL RESULTS OF A RANDOMIZED CLINICAL TRIAL
A) determination of factors in the exposed group
B) determination of life expectancy indicators
C) +frequency of repeated hospitalizations
D) the objectivity of clinical indicators
E) risk factor definitions

156. SPECIFY WHICH OF THE CRITERIA RELATES TO THE FINAL RESULTS OF A RANDOMIZED CLINICAL TRIAL
A) infant mortality
B) mortality due to age
C) + Assessment of the quality of life
D) maternal mortality
E) perinatal mortality

157. COHORT STUDIES ARE

A) +selection of a group of patients for a similar trait, which will be traced in the future

B) lifestyle hypothesis

C) preventive measures

D) selection of a group of patients for non-similar signs

E) a method of minimizing the conscious or unconscious possibility of influencing the results of the study by its participants.

158. CASE–CONTROL STUDIES ARE

A)+ a study organized to identify the relationship between a risk factor and a clinical outcome

B) a study comparing the proportion of people not participating in the trial

C) exposed to the risk factor

D) not exposed to the risk factor

E) development of educational programs

159. CASE SERIES STUDIES OR DESCRIPTIVE RESEARCH IS

A) includes several research hypotheses

B) results of laboratory and instrumental studies

C) at the beginning of the study, the outcome is not known

D)+ cases: the presence of a disease or outcome

E) the main indicators related to the patient's vital activity

160. A RETROSPECTIVE STUDY IS

A)+ case–control study

B) meta-analysis

C) cohort study

D) literary review

E) systematic review

161. NATIONAL CLINICAL GUIDELINES

A)+ an effective tool for continuous, measurable improvement of both daily medical care and improvement of the quality of medical services

B) description of a series of cases – a study of the same intervention in individual sequentially included patients without a control group

C) describes a certain number of interesting characteristics in the observed small groups of patients

D) the distribution of patients into groups should be randomized, i.e. by a random sampling method, which allows to exclude all possible differences between the compared groups that could potentially affect the outcome of the study

E) a method of minimizing the conscious or unconscious possibility of influencing the results of the study by its participants.

162. ONE OF THE PRINCIPLES OF EVIDENCE-BASED MEDICINE IN THE CREATION OF CLINICAL PRACTICE GUIDELINES.

A) +They are used by doctors, outpatient and hospital managers, healthcare managers, healthcare economists, etc.

B) Used by doctors, outpatient clinic managers, health care providers, health ecanomists. paramedics of the emergency medical service.

C) The distribution of patients into groups should be randomized, i.e. by a random sampling method, which makes it possible to exclude all possible differences between the compared groups that could potentially affect the outcome of the study.

D) An indifferent substance (procedure) used to compare its effects with the effects of a real medicine or other intervention.

E) Clinical guidelines, when properly compiled and implemented, contribute to improving the quality of medical care and reducing its cost.

163.CLINICAL GUIDELINES ARE USED FOR

A) +Effectiveness of treatment, effectiveness of treatment costs, quality of treatment, scientific approach to treatment

B) Improving the quality of life, reducing the frequency of complications, relieving the symptoms of the disease

C) The main indicators related to the patient's vital activity (death from any cause or the main one – the investigated disease, recovery from the investigated disease)

D) Increase the satisfaction of nursing staff

E) Improvement of the organization

164. CLINICAL PRACTICAL GUIDELINES

A) + Effectiveness of treatment, effectiveness of treatment costs, quality of treatment, scientific approach to treatment, improving the level of education, legal protection, improvement of the organization.

B) Effectiveness of treatment, quality of treatment, scientific approach to treatment, effectiveness of treatment of education, legal protection, improvement of the organization.

C) Quality of treatment, scientific approach to treatment, improvement of the level of education, legal protection of the patient, improvement of the organization, effectiveness of treatment, effectiveness of treatment costs

D) The effectiveness of treatment costs, the quality of treatment, improving the level of education, legal protection, improving the level of organization, the effectiveness of treatment

E) quality of treatment, scientific approach to treatment, improvement of the level of education, legal protection, improvement of the organization.

165.REQUIREMENTS FOR THE DEVELOPMENT OF THE CRC

A)+ reflect the optimal standard of living, ensure continuity and continuity in diagnosis, treatment, prevention and rehabilitation

B) prevention and rehabilitation, diagnosis and treatment of their continuity, improvement of quality of life with patient orientation

C) rehabilitation and improvement of the quality of life, minimization of resources

D) improving the quality of life, reducing the frequency of complications, relieving the symptoms of the disease

E) minimize the irrational use of resources, understand the reasons

166.TYPES OF CLINICAL GUIDELINES

A) based on a literary review

B) based on clinical protocols

C) based on clinical protocols and guidelines

D) based on a literary and systematic review

E) +based on best practice, clinical protocols.

167.THE MOST LIKELY TYPE OF CLINICAL GUIDELINES

A) +Expanded guidelines, based on evidence, clinical protocols and consensus

B) Extended guidelines based on statistical indicators – investigated disease, systematic review, meta– analysis

C) Quantitative systematic review of the literature or quantitative synthesis of primary data to obtain summary statistical indicators

D) Consensus-based guidelines, a quantitative assessment of the total effect established on the basis of the results of all scientific studies.

E) Consensus-based, quantitative assessment of the total effect established on the basis of the results of all scientific studies, clinical protocols

168. STAGES OF CLINICAL GUIDELINES

A) +choosing a topic for writing clinical practice guidelines based on the most serious characteristics of the disease (morbidity, mortality, etc. factors)

B) conduct a systematic review of the disease and scientific research and statistical indicators, development of a draft recommendation.

C) collection of anamnesis, opinions of doctors, conduct of a systematic review on this disease and scientific research and statistical indicators.

D) quantitative systematic review of the literature or quantitative synthesis of primary data to obtain summary statistical indicators.

E) development of a draft recommendation, conducting a systematic literature review and identification of systematic errors, audit behavior (internal and external audit)

169. STAGES OF EVIDENCE-BASED CLINICAL GUIDELINES.

A) conducting a systematic review of the literature

B) conducting a systematic review of programs in the media

C) based on evidence and consensus, statistical indicators

D) based on consensus and serious characteristics of the disease (morbidity, mortality, etc. factors)

E)+ develop draft recommendations, finalize the development of the CRC and get approval from the main interest groups

170. ADVANTAGES OF CLINICAL GUIDELINES:

A) prospective studies can be conducted in which patients are included in the intervention group to determine the cause-effect relationship between medical intervention and clinical outcome

B) can be used as a methodological material for the development of information and educational materials

C) +can be used to develop short reference books for healthcare practitioners and handouts for patient education

D) the distribution of patients into groups is carried out randomly, i.e. by a random sampling method, which will eliminate all possible differences between the compared groups that could potentially affect the results of the study

E) a quantitative systematic review of the literature or a quantitative synthesis of primary data can be carried out to obtain summary statistical indicators

171. THE PROCESS OF DEVELOPING AND EVALUATING GUIDELINES SHOULD FOCUS ON THE OUTCOMES THAT ARE MOST IMPORTANT TO (CONSUMERS) THIS IS

A) A type of clinical guidance

B) +the principle of developing clinical guidelines

C) the principle of standard developments of clinical guidelines

D) the basic principle of the development of clinical guidelines

E) the stage of development of clinical practice guidelines based on evidence.

172. PRINCIPLES OF CLINICAL GUIDELINES DEVELOPMENT

A) +Guidelines should be based on the best evidence and should include guidance on the level of evidence of individual provisions of the proposed CRC

B) the development of clinical guidelines should be based on the quantitative synthesis of primary data to obtain summary statistical indicators

C) the development of clinical guidelines should include a plan for dissemination and implementation, to be prepared within 10 years

D) the development of clinical guidelines should be based on the analysis of medical interventions performed.

E) clinical guidelines should be based on the analysis of medical interventions performed

173. THE DEVELOPMENT OF A CLINICAL PROTOCOL IN A MEDICAL ORGANIZATION INCLUDES THE FOLLOWING STAGES

A)+ formation of a working group. formation of the text of the clinical protocol, implementation of the clinical protocol in the activities of a medical organization

B) combining research, introducing clinical guidance into the process of medical universities, forming a research group.

C) organization of the research group, preparation of clinical guidelines, the working group includes (managers, health care organizers, auditors)

D) the formation of a research group consists of (hospital and polyclinic managers, auditors, health managers), the introduction of clinical practical guidance in the practice of healthcare.

E) development of clinical practical guidelines, formation of a research group of guidelines, implementation in healthcare practice

174. THE DEVELOPED CLINICAL PROTOCOL HAS SECTIONS

A) patient model, payment model

B) the patient's model, the list of medicines of the main and additional assortment.

C) the model of remuneration of medical workers, standard operations and procedures for meeting the requirements of the protocol

D)+ patient model, list of medicines of the main and additional assortment, standard operations and procedures for meeting the requirements of the protocol

E) a list of medicines of the main and additional assortment, standard operations and procedures for meeting the requirements of the protocol

175. CLINICAL PRACTICAL RUKAVODSTVO, ITS MOST PROBABLE CONTENT

A) standardized approaches to the diagnosis, treatment and prevention of diseases based on the principles of evidence-based medicine

B) regulatory support of the quality management system of medical care in medical organizations

C) justification of the program of state guarantees of medical care to the population

D)+ monitoring compliance with the action plan for the introduction of new treatment methods.

E) makes it possible to use non-effective medicines for patients

176. ADVANTAGES OF CPR FOR A PRACTICING PHYSICIAN

A) excludes the possibility of using clinical thinking

B) makes it possible to use more expensive methods of diagnosis and treatment

C) excludes the possibility of using diagnostic and treatment methods based on evidence-based medicine

D)+ When encountering an emergency situation, a practitioner can always turn to the clinical management and prescribe treatment based on evidence-based medicine to the patient

E) makes it possible to use non-effective medicines

177. EVIDENCE-BASED GUIDANCE, ITS BENEFITS:

A) + Is used as a model for the development of protocols and standards by managers of hospitals and outpatient clinics, for health planning and other tasks that solve the issues of staffing of medical institutions and the development of realistic budgets

B) Clinical protocols compiled by hospital and outpatient managers, handouts for patient education, are based on consensus and should be evaluated for usefulness.

C) It is used to develop short clinical reference books for healthcare practitioners and other tasks.

D) Development of realistic budgets, development of standards, protocols

178. EVIDENCE-BASED GUIDANCE, ITS DISADVANTAGES:

A) +It takes time to create a working group that will include all interested representatives.

B) To compare all positive effects and negative effects with all possible approaches, the maximum number of test participants is required.

C) it takes time to carry out the distribution of patients into groups randomly, i.e. by random sampling, which allows you to exclude all possible differences between the compared groups that could potentially affect the results of the study

D) an indifferent substance (procedure) used to compare its effects with the effects of a real medicine or other intervention.

E) it takes time to conduct a quantitative systematic review of the literature and quantitative synthesis of primary data to obtain summary statistical indicators

179. THE CRC ASSESSMENT IS NEEDED FOR

A) +Substandard CPR can put many patients at serious risk

B) High quality CPR plays an important role in healthcare

C) High-quality CRC to create recommendations worldwide

D) Has internal reliability and generalizability

E) The CRC is not applicable in practice

180. QPR QUALITY

A) Systematic mistakes have been made

B) Internal reliability and generalizability

C) High reliability, and are applicable in practice

D) +Providing high quality and plays an important role in healthcare.

E) Potential systematic errors have been warned or there are warnings

181. THE MOST LIKELY DEFINITION OF «CLINICAL PRACTICAL GUIDANCE»

A) + are effective tools for continuous improvement of daily medical care and improvement of long-term results and favorable treatment outcomes

B) this is a scientific work where the object of study is the results of a number of original studies

C) this is a review in which the results of the original studies are considered, but not statistically combined

D) this is a quantitative analysis of the combined results of several clinical trials of the same intervention

E) these are guidelines for studying the pharmacokinetics of drugs

182. CLINICAL GUIDELINES ARE NOT USED BY ANYONE
A) managers of outpatient clinics and hospitals
C) health managers
B) health economists
D) practicing physicians
E) + patients

183. CLINICAL GUIDELINES ARE INTENDED FOR
A) +Health Care Organizers
B) Students of medical universities and colleges
C) For resident doctors and outpatient clinic managers
D) To improve the quality of medical care and insurance
E) To improve the quality and accessibility of medical care.

184. PURPOSE OF APPLICATION OF CLINICAL PRACTICE GUIDELINES
A) + Improving the effectiveness of treatment, improving the organization of medical care
B) Availability of medical care, increase in the cost of medical services.
C) Quality organization of medical care, insurance.
D) Scientific approach to treatment
E) Quality treatment

185. REQUIREMENTS FOR THE DEVELOPMENT OF CLINICAL GUIDELINES
A) Diagnosis, treatment, prevention, rehabilitation
B) +Reflect the optimal level of treatment and services
C) Increase the cost of medical services
D) Reduce the availability of medical care
E) clinical practice

186.OBJECTIVES OF THE AGREE COLLABORATION ACTIVITY
A) + Development of a unified approach to the creation of the CRC, definition of quality criteria, monitoring.

B) Dissemination of a critical approach to the creation of the CRC
C) Quality monitoring of the CRC
D) A unified approach to the creation of the CRC
E) High-quality CPR

187. OBJECTIVES OF THE AGREE QUESTIONNAIRE
A) +Creation of a systematic approach to assessing the quality of the CRC
B) Introduction of the CRC into healthcare practice
C) Creating recommendations and meta-analysis
D) Quality monitoring
E) Accessibility

188. AGREE IS INTENDED
A) State bodies
B) For medical representatives, their self-assessment and training
C) For the correct sequence, development methodology
D)To decide which clinical guidelines should be implemented
E) +For compilers of clinical recommendations – to follow a strict methodology for developing and self-evaluating the quality of their recommendations

189. STRUCTURE OF THE AGREE QUESTIONNAIRE
A) 23 points, each section considers an independent
quality characteristic
B) 23 sections, 6 paragraphs in each section, an independent quality characteristic is considered.
C) 23 items grouped into 8 sections
D) 23 items grouped into 23 sections
E) +23 items grouped into 6 sections

190. 1 SECTION OF THE STRUCTURE OF THE AGREE QUESTIONNAIRE
(A) Stakeholder participation (paragraphs 4-7)
B) +Scope and objectives (paragraphs 1-3)
C) Thoroughness of development (paragraphs 8-14)

D) Scope of application (paragraphs 1-7)
E) Stakeholder participation (1-3)

191. 2 SECTION OF THE STRUCTURE OF THE AGREE QUESTIONNAIRE
A) Stakeholder participation and objectives (paragraphs 1-3)
B) +Stakeholder participation (paragraphs 4-7)
C) Objectives and stakeholder participation(1-3)
D) Thoroughness of development (paragraphs 8-14)
E) Scope of application (paragraphs 1-7)

192. 3 SECTION OF THE STRUCTURE OF THE AGREE QUESTIONNAIRE
(A) Stakeholder participation and objectives (paragraphs 1-3)
B) Stakeholder participation (paragraphs 4-7)
C) Objectives and stakeholder participation (1-3)
D) + Thoroughness of development (paragraphs 8-14)
E) Scope of application (paragraphs 1-7)

193. 4 SECTION OF THE STRUCTURE OF THE AGREE QUESTIONNAIRE
A) + Clarity of presentation and form of presentation (paragraphs 15-18)
B) Stakeholder participation (paragraphs 14-17)
C) Objectives and stakeholder participation (11-18)
D) Thoroughness of development (paragraphs 8-14)
E) Scope of application (paragraphs 1-7)

194. 5 SECTION OF THE STRUCTURE OF THE AGREE QUESTIONNAIRE
A) Clarity of presentation and form of presentation (15-18)
B) Participation of stakeholders (paragraphs 4-7)
C) Thoroughness of development (paragraphs 18-24)
D) +Possibility of implementation (paragraphs 19-21)
E) Scope of application (paragraphs 1-3)

195. 6 SECTION STRUCTURE OF THE AGREE SURVEY

A)Clarity of presentation and form of presentation (15-18)

B) participation of interested parties (paragraphs 4-7)

C) Thoroughness of development (paragraphs 18-24)

D) The possibility of introduction (paragraphs 19-21)

E) + independence of developers (paragraphs 22-23)

196. THE NUMBER OF EXPERTS PARTICIPATING IN THE AGREE SURVEY:

A) + it is recommended to involve at least 2, preferably 4 experts in the evaluation of each of the clinical recommendations, which will increase the reliability of the assessment.

B) recommend several clinical recommendations for evaluation approximately (4), and preferably 4 experts

C) Out of 5 clinical recommendations for reliability, 5 experts

D) for a reliable assessment includes 2 experts, involving 4 or more experts in the assessment

E) Out of 2 clinical recommendations for the reliability of the assessment of 4 experts

197. NUMBER OF AGREE SURVEY SECTIONS:

A) + 6 sections

C) 16 sections

C) Section 4

D) Section 2

E) Section 8

198. «CLINICAL PROTOCOL»

A) scientific work in which the object of study is the results of a number of original studies

B) a review in which the results of the original studies are considered, but not statistically combined

C) quantitative analysis of the combined results of several clinical trials of the same drug

D) protocols for studying the pharmacokinetics of drugs

E) a regulatory document defining the requirements for providing medical care to a patient with a certain disease, with a certain syndrome or a certain clinical situation in a medical institution

199. WHAT TYPES OF CLINICAL GUIDELINES ARE THERE

A) + guidelines based on best practices, clinical protocols

B) guidelines based on critical assessments of experts

C) guidelines based on negative effects

D) guidelines based on positive effects

E) experimental manuals

200. THE PURPOSE OF DEVELOPING A CLINICAL PROTOCOL

A) regulatory support of the quality management system of medical care in a medical organization

B) determination of the degree of reliability of meta-analysis conclusions

C) exclusion of system errors

D) comparison of results for each individual study or case

E) combining studies with different outcomes

201. TASKS OF DEVELOPING A CLINICAL PROTOCOL

A) protection of the rights of the patient and the doctor in resolving controversial and conflict issues, conducting examinations, assessing the quality of medical care for patients with a certain disease

B) conducting an examination and assessment of the quality of medical care for patients with a certain disease, syndrome or in a certain clinical situation, and planning measures to improve it

C) selection of optimal technologies for prevention, diagnosis, treatment and rehabilitation for a particular patient

D) Reduction in the quality of technologies for prevention, diagnosis, treatment and rehabilitation of patients

E) Reduction in the volume of medical care

202. SELECT THE MOST LIKELY COMPOSITION OF THE WORKING GROUP FOR THE PREPARATION OF THE CLINICAL PROTOCOL AND COORDINATION OF WORK ON ITS IMPLEMENTATION:

A) the chief physician or his deputy for medical and clinical expert work, leading experts in the field of application of the clinical protocol ;

B) heads of all departments of a medical organization involved in pro-

viding medical care to patients who are subject to the requirements of the clinical protocol;

C) leading specialists whose field of activity corresponds to the scope of application of the clinical protocol;

D) junior medical staff, department heads, patients

E) the patient;

203. WHAT SECTIONS DOES THE CLINICAL PROTOCOL BEING DEVELOPED HAVE

A) doctor's model;

B) patient model;

C) the model of remuneration of medical workers;

D) standard operations and procedures for meeting protocol requirements;

E) + a list of medicines of the main, additional, patient treatment model, procedures and operations to meet the requirements of the protocol.

204. WHAT TOOL IS USED TO EVALUATE CLINICAL GUIDANCE

A) V. V. Vlasov's questionnaire

C) The Macron Questionnaire

C) The Cochrane Questionnaire

D) The Chalmer Questionnaire

E) + agree survey

205. DISADVANTAGES OF APPLYING EVIDENCE-BASED GUIDANCE

A) development of protocols is required

B) clear separation of opinions from evidence

C) can be used as a model for the development of protocols and standards for hospital and outpatient managers

D) can be used to develop short reference books for health practitioners

E) + it takes time to create a working group that will include all interested representatives

206. NUMBER OF AGREE SURVEY ITEMS
(A) Paragraph 6
C) Paragraph 8
C) Paragraph 10
D) +23 Pp. L.
E) Paragraph 28

207. IN WHICH COUNTRY WAS THE AGREE QUESTIONNAIRE CREATED
A) China
B) Russia
C) Ukraine
D) France
E) + Great Britain

208. WHICH OF THE LISTED ITEMS DOES NOT APPLY TO THE AGREE COLLABORATION ITEMS
A) Development of a unified approach to the creation of the CRC
B) Creation of a tool for assessing and monitoring the quality of the CRC
C) Definition of the quality criteria of the CRC
D) Spreading a critical approach to the creation of the CRC around the world
E)+ development of various approaches to the creation of the CRC

209. WHAT IS THE FINAL EXPERT ASSESSMENT OF THE QUALITY OF THE CRC
A)+ Highly recommend/Recommend with reservations and changes
B)/Not sure/ agree
C) yes/ no/ don't know
D) I agree/ I don't quite agree
E) I find it difficult to answer

210. HOW ARE THE SCORES CALCULATED ACCORDING TO THE AGREE QUESTIONNAIRE
A) +Points for each of the six sections are calculated independently and are not combined into a single quality assessment

B) The scores for each of the six sections are calculated together and summed up into a single quality assessment

C) Points are calculated according to a special formula

D) Evaluation of points is not carried out

E) there is no correct answer

211. HOW IS THE EVALUATION OF EACH ITEM OF THE AGREE QUESTIONNAIRE CARRIED OUT

A) + 4-point scale

B) a 9-point scale

C) on a 5-point scale

D) a 10-point scale

E) not evaluated

212. WHICH SECTIONS ARE INCLUDED IN THE STRUCTURE OF THE AGREE QUESTIONNAIRE

A) +Scope and objectives

B) Reliability of the questionnaire

C) high-quality development

D) Clarity of presentation

E) Difficulties of implementation

213. WHICH OF THE FOLLOWING SECTIONS IS NOT INCLUDED IN THE STRUCTURE OF THE AGREE QUESTIONNAIRE

A) Scope and objectives

B) +Reliability of the questionnaire

C) Thoroughness of development

D) Clarity of presentation and form of presentation

E) Developer independence

214. HOW MANY EXPERTS ARE INVOLVED TO EVALUATE CLINICAL GUIDELINES USING THE AGREE QUESTIONNAIRE

A) +2-4 experts

B) 3-4 expert

C) 4 experts

D) 5 experts
E) 5 or more experts

215. HOW MANY BASIC TYPES OF CLINICAL GUIDELINES HAVE BEEN DEVELOPED

A) +The New Zealand Clinical Guidelines Development Group has identified 5 main types of guidelines

B) 3 types of clinical guidelines have been developed

C) The New Zealand Clinical Guidelines Development Group has identified 10 main types of guidelines

D) 12 basic and additional types of clinical guidelines have been developed

E) Clinical guidelines are not divided by type

216. THE MOST LIKELY CHARACTERISTIC FOR EVIDENCE-BASED GUIDELINES

A) Guidelines designed to reduce the volume of medical care

B)+ include a strategy for describing the significance of the evidence presented and try to clearly separate opinions from evidence

C) calculate the relative difference in outcomes, including both a positive result and positive manifestations

D) calculate the absolute difference in outcomes, including only a negative result

E) calculate the absolute difference in outcomes, including only a positive result

217. WHICH OF THE CHARACTERISTICS RELATE TO EVIDENCE-BASED GUIDELINES

A) Guidelines designed to reduce the volume of medical care

B) do not include a strategy for describing the significance of the evidence presented and try to clearly separate opinions from evidence

C) + calculate the absolute difference in outcomes, including both positive results and negative manifestations

D) calculate the absolute difference in outcomes, including only a negative result

E) calculate the absolute difference in outcomes, including only a positive result

218. WHAT ARE THE MAIN PRINCIPLES FOR THE DEVELOPMENT OF CLINICAL PRACTICE GUIDELINES

A) The development process should not involve consumers

B) + The process of developing and evaluating guidelines should focus on the outcomes that are most important to consumers (quality of life indicators, survival rates)

C) Guidelines are developed without taking into account limited resources

D) Guidelines are developed in order to reduce the quality of technologies for prevention, diagnosis, treatment and rehabilitation of patients

E) Guidelines are being developed in order to reduce the volume of medical care.

219. THE MOST LIKELY VERSION OF THE GROUPS HAS DEVELOPED THE MAIN TYPES OF CLINICAL GUIDELINES

A) + The New Zealand Clinical Guidelines Development Group has identified 5 main types of guidelines

B) The New Zealand Clinical Guidelines Development Group has identified 10 main types of guidelines

C) 12 basic and additional types of clinical guidelines have been developed

D) Clinical guidelines are not divided by type

E) 3 types of clinical guidelines have been developed

220. IMPLEMENTATION OF EVIDENCE-BASED GUIDANCE.

A) + Should be familiar with the indicators and the recommended minimum of data that they should collect in order to make an assessment

B) The clinician recommends the implementation of the MANUAL

C) Specialists of a narrow profile should answer all questions, as well as a group of patients

D) Make a presentation on all regions and familiarize yourself with the manual in full

E) Implementation of the field of evaluation of the main results

221. WHAT ARE THE MAIN PRINCIPLES FOR THE DEVELOPMENT OF CLINICAL PRACTICE GUIDELINES

A) +The development process should not involve consumers

B) The process of developing and evaluating guidelines should focus on the outcomes that are most important to consumers (quality of life indicators, survival rates)

C) Guidelines are developed without taking into account limited resources

D) Guidelines are developed in order to reduce the quality of technologies for prevention, diagnosis, treatment and rehabilitation of patients

E) Guidelines are being developed in order to reduce the volume of medical care

222. AFTER WHAT PERIOD OF TIME IS IT RECOMMENDED TO CONDUCT AN AUDIT OF CLINICAL GUIDELINES AFTER IMPLEMENTATION INTO PRACTICE

A) conducting an audit after the introduction of the CRC into practice is not necessary

B) + is recommended to be carried out within two years after the introduction of the CRC into practice

C) audit within 15 years after implementation into practice

D) it is carried out within 10 years after its introduction into practice

E) the audit is carried out according to the wishes of the administration.

223. IMPROVING THE EFFECTIVENESS OF TREATMENT COSTS RELATES TO

A) + To the purposes of the application of clinical practice guidelines

B) To the tasks of applying clinical guidelines

C) Audit of clinical guidelines

D) Evaluation of clinical guidelines

E) Revision of the CRC

224. EVIDENCE-BASED GUIDELINES, BENEFITS

A) +can be used as a model for the development of protocols and standards by managers of hospitals and outpatient clinics, for health planning and other tasks that solve the issues of staffing of medical institutions and the development of realistic budgets

B) Cannot be used for the development of short reference books for healthcare practitioners and handouts for patient education

C) It is used for the development of handouts and for training specialists of various profiles

D) Not used for the development of clinical guidelines

E) Used to develop protocols and standards

225. WHEN DEVELOPING CLINICAL PRACTICE GUIDELINES, IT IS NOT REQUIRED

A) Ensure continuity and continuity in diagnosis, treatment, prevention, rehabilitation

B) increase patient satisfaction with the quality of medical care

C) Increase the irrational use of resources

D)+ Ensure a reduction in the quality of medical care

E) Reflect the optimal level of treatment and services

226. WHAT CHARACTERIZES EVIDENCE-BASED MANAGEMENT

A) are not developed based on the results of a systematic search and evaluation of information in the specialized literature

B) do not include a strategy for describing the significance of the evidence presented and try to clearly separate opinions from evidence

C) + calculate the absolute difference in outcomes, including both positive results and negative manifestations

D) calculate the absolute difference in outcomes, including only a negative result

E) calculate the absolute difference in outcomes, including only a positive result

227. THE DIFFERENCE BETWEEN EXPANDED EVIDENCE-BASED GUIDELINES FROM OTHER TYPES OF CLINICAL GUIDELINES:

A) + project the consequences that will bring changes in medical practice in a certain population group, for the health care system as a whole

B) calculate the absolute difference in outcomes, including only negative results

C) Reduce patient satisfaction with the quality of medical care

D) Provide a reduction in the quality of patient-centered medical care

E) Increase the irrational use of resources

228. THE BASIS FOR THE DEVELOPMENT OF CLINICAL PRACTICE GUIDELINES

A) The development process should not involve consumers

B) + The process of developing and evaluating guidelines should focus on the outcomes that are most important to consumers (quality of life indicators, survival rates)

C) Guidelines are developed in order to reduce the quality of technologies for prevention, diagnosis, treatment and rehabilitation of patients

D) Guidelines are being developed in order to reduce the volume of medical care

E) Guidelines are developed without taking into account limited resources

229. WHAT REQUIREMENTS ARE NOT IMPOSED ON THE DEVELOPMENT OF CLINICAL GUIDELINES:

A) Ensure continuity and continuity in diagnosis, treatment, prevention, rehabilitation

B) +Reduce patient satisfaction with the quality of medical care

C) To ensure the improvement of the quality of medical care

D) Results of irrational resources used

E) Reflect the optimal level of treatment and services

230. THE MOST LIKELY TYPE OF CLINICAL GUIDANCE THAT DIFFERS FROM EXTENDED GUIDELINES

A) +project the consequences that will bring changes in medical practice in a certain group of the population, for the health care system as a whole

B) calculate the absolute difference in outcomes, including only negative results

C) Provide a reduction in the quality of patient-centered medical care

D) reduce patient satisfaction with the quality of medical care

E) Increase the irrational use of resources

231. WHAT PRINCIPLES DO CLINICAL PRACTICE GUIDELINES FOLLOW?

A) The development process should not involve consumers

B) +The process of developing and evaluating guidelines should focus on the outcomes that are most important to consumers (quality of life indicators, survival rates)

C) Guidelines are developed without taking into account limited resources

D) Guidelines are developed in order to reduce the quality of technologies for prevention, diagnosis, treatment and rehabilitation of patients

E) Guidelines are being developed in order to reduce the volume of medical care

232. AUDIT OF CLINICAL PRACTICE GUIDELINES IS CONDUCTED

A) conducting an audit after the introduction of the CRC into practice is not necessary

B)+ within two years after the introduction of the CRC into practice

C) within 15 years after its introduction into practice

D) the audit is carried out within 10 years after its introduction into practice

E) the audit is carried out according to the wishes of the administration

233. IMPROVING THE EFFECTIVENESS OF TREATMENT COSTS RELATES TO

A) + To the purposes of the application of clinical practice guidelines

B) To the tasks of applying clinical guidelines

C) Audit of clinical guidelines

D) Evaluation of clinical guidelines

E) Revision of the CRC

234. THE ASSESSMENT OF THE CRC IS NECESSARY FOR

A) +Professional and governmental structures must be convinced of the high quality of the CRC before they can recommend them for implementation in practice

B) Potential systematic errors have been warned or there is a warning of their existence

C) The CRC plays an important role in the health system of most countries

D) Users can evaluate the quality and put it into practice

E) KPIs give measurable differences in results

235. EVIDENCE-BASED GUIDANCE, BENEFITS

A) +can be used as a model for the development of protocols and standards by managers of hospitals and outpatient clinics, for health planning and other tasks that solve the issues of staffing of medical institutions and the development of realistic budgets

B) Cannot be used for the development of short reference books for healthcare practitioners and handouts for patient education

C) It is used for the development of handouts and for training specialists of various profiles

D) Not used for the development of clinical guidelines

E) Used to develop protocols and standards

236. FOR WHAT PURPOSE ARE CLINICAL PRACTICE GUIDELINES USED

A) Legal protection of a doctor, increasing the level of education of doctors

B) Increase the cost of medical services

C) Decrease in the quality of treatment

D) +Improving the level of education of medical personnel

E) Reducing the effectiveness of treatment costs

237. IN WHICH CASES IS THE CRC RECOMMENDED FOR AUDIT

A) +If the data obtained is very significant, a more early revision may be required

B) Review and verify the poor quality of the CRC before they can recommend them for implementation in practice

C) Potential systematic errors have been warned or there is a warning of their existence

D) The CRC plays an important role in the health care system, to be reviewed beforehand, before receiving an assessment of approximate results

E) KPIs give measurable differences in results

238. COOPERATION AGREE
A) Since 1995 Europe
B) Since 1997 Geneva
C) Since 1996, Norway
D) Since 1999 Belarus
E) +Since 1998 New Zealand

239. WHERE THE AGREE COLLABORATION WAS CREATED
A) +Europe
B) Geneva
C) Norway
D) Indonesia
E) Belarus

240. WHICH COUNTRIES ARE INCLUDED IN THE AGREE CO-OPERATION
A) + Europe, USA, Canada
B) Geneva, Canada, USA
C) Belarus, Russia, Canada
D) Europe, Belarus, Russia
E) Norway, Australia, Russia

241.SYSTEMATIC REVIEWS ARE
A)+A scientific work where the object of research is the results of a number of original studies on one problem, i.e. the results of these studies are analyzed using approaches that reduce the possibility of systematic and random errors
B) The pinnacle of evidence and serious scientific research:
C) Modern medical science, which is a universally recognized standard of scientific research for evaluating clinical effectiveness
D) The method used to form a sequence of random assignment of test participants to groups
E) A quantitative systematic review of the literature or a quantitative synthesis of primary data to obtain summary statistical indicators.

242.SPECIFY THE PURPOSE OF THE SYSTEMATIC REVIEW:

A) A quantitative systematic review of the literature or a quantitative synthesis of primary data to obtain summary statistical indicators

B) Consideration of the results of original research on a single problem or system, but no statistical analysis is carried out

C) Modern medical science, which is a universally recognized standard of scientific research for evaluating clinical effectiveness

D) The method used to form a sequence of random assignment of test participants to groups

E)+ A balanced and impartial study of the results of previously conducted studies.

243.A SYSTEMATIC ERROR IS

A)+ Systematic deviation of the results from the true values

B) Gradual change included by a person

C) Systematic modification of primary materials

D) Timely changed data

E) Quantitative indicators of the study

244. A QUALITATIVE SYSTEMATIC REVIEW IS

A) Quantitative systematic review of the literature or quantitative synthesis of primary data to obtain summary statistical indicators

B) The pinnacle of evidence and serious scientific research

C) Modern medical science, which is a universally recognized standard of scientific research for assessing clinical effectiveness

D) The method used to form a sequence of random assignment of test participants to groups

E)+ Review of the results of original research on one problem or system, but no statistical analysis is carried out.

245. A RANDOM ERROR IS:

A)+ Deviation of the observation result in the sample from the true value in the population

B) Systematic rejection of the results of the study

C) Gradual change incorporated by a person

D) Timely changed data

E) The method of observation in the sample

246. WHAT IS ONE OF THE POSSIBLE DISADVANTAGES OF QUALITATIVE SYSTEMATIC REVIEWS

A)+ Errors related to the preferential selection of positive results

B) Errors related to the involvement of respondents for analysis

C) Considers a narrow range of clinical issues

D) The use of strictly scientific data

E) The data used is false

247. POSSIBLE DISADVANTAGES OF QUALITATIVE SYSTEMATIC REVIEWS

A)+ Often consider a wide range of clinical issues, strictly scientific methods are not used, often reflect only the subjective opinion of the authors

B) Do not use strictly scientific methods, considers a narrow range of clinical issues

C) Often reflect the subjective opinion of the authors, errors associated with the preferential selection of positive results, the choice of respondents for clinical trials is random

D) Errors associated with the preferential selection of positive results often reflect the opinion of experts, the evidence of the data is not verified

E) Often consider a wide range of clinical issues, errors associated with the preferential selection of negative results

248. AREAS OF APPLICATION OF META-ANALYSIS:

A)+ Help to substantiate the research hypothesis, the size of the planned clinical trial, as well as to identify important side effects of the studied drug

B) Provide the doctor with subjective information, including an assessment of the inefficiency of various methods

C) Assist nurses in developing recommendations

D) Help pharmacologists in choosing tactics for managing patients

E) Provide the researcher with unreliable data.

249. TO SOLVE WHAT ISSUES META-ANALYSIS IS USED:

A) +Help healthcare organizers in developing recommendations and legislative acts (regularly updated AAS recommendations on patient management)

B) Provide the doctor with subjective information, including an assessment of the inefficiency of various methods

C) Assist nurses in developing recommendations

D) Help pharmacologists in choosing tactics for managing patients

E) Provide the researcher with unreliable data

250. AN AUDIT CONDUCTED BY EMPLOYEES OF THE QA DEPARTMENT OF A PHARMACEUTICAL COMPANY OR CRO, WHO THEMSELVES DIRECTLY ORGANIZE AND CONTROL THE CONDUCT OF THIS CLINICAL TRIAL IS:

A) An External audit

B) +Internal audit

C) Audit of the organization

D) Audit of the research center

251. SPECIFY WHAT IS META-ANALYSIS?

A)+ Quantitative systematic review of the literature or quantitative synthesis of primary data to obtain summary statistical indicators

B) The pinnacle of evidence and serious scientific research: a quantitative assessment of the total effect established on the basis of the results of all scientific research

C) Modern medical science, which is a universally recognized standard of scientific research for assessing clinical effectiveness

D) The method used to form a sequence of random assignment of test participants to groups

E) Consideration of the results of original research on a single problem or system, but no statistical analysis is carried out.

252. ALGORITHM OF META-ANALYSIS:

A) + Establish the feasibility of conducting a meta-analysis and formulate a goal, find all studies on the topic that meet the criteria, prepare conclusions and recommendations for medical practice and further scientific research

B) Form a limited database on the topic of meta-analysis, describe all possible limitations and discrepancies in the database, for research on the selected topic include 1 test

C) Prepare proposals for medical practice and further scientific research, prepare a structured abstract, unproven studies are selected for meta-analysis

D) Create a database on the topic of meta-analysis, combine these data for human research

E) With the help of statistical methods, take into account the factors affecting the final result, conduct a compatibility analysis, prepare proposals for junior medical personnel

253. FORMULATION OF THE META-ANALYSIS GOAL:

A) The goal should be vague and formulated in the form of a clinical response

B)+ Often the purpose of meta-analysis is to determine the comparative effectiveness of a treatment method or to determine the total effect of several drugs of similar action

C) The purpose of the meta-analysis is to create a database of cohort studies

D) The purpose of the meta-analysis should be clear and formulated vaguely in the form of a question

E) Often raise the question of non-compatibility of medicines

254. THE MAIN STAGES OF DATA SEARCH ON THE TOPIC OF META-ANALYSIS:

A)+ Viewing electronic databases (Medline and others), viewing bibliographic references in articles and books containing references to publications of interest, contacts with other specialists in this field

B) Contacts with other experts in the field, viewing electronic databases, taking into account the opinions of individual authors

C) Contacts with representatives of pharmaceutical companies producing the evaluated drugs, taking into account the opinions of individual authors, contact with other specialists in different fields of sciences

D) Viewing electronic databases, viewing books and articles, from clinical research to take only descriptive

E) Viewing bibliographic references in articles and books containing references to publications of interest, taking into account the opinion of only individual authors

255. THE SELECTION OF STUDIES FOR INCLUSION IN THE META-ANALYSIS IS:

A) +Clear criteria for inclusion and exclusion of patients, the location of the study, the duration of the study, deviation from the protocol (if any)

B) The location of the study, the duration of the study, the criteria for inclusion and exclusion of patients does not matter

C) Diagnostic criteria of the disease, the scheme of application of the drug, the place of the study may vary according to circumstances

D) The location and duration of the study varies in waves, the criteria for inclusion of patients in the study does not matter

E) Clear criteria for inclusion and exclusion of patients, deviations from protocols are not taken into account

256. FOR INCLUSION IN THE META-ANALYSIS, THE SELECTION OF THE STUDY DOES NOT INCLUDE:

A) Clear criteria for inclusion and exclusion of patients

B) The place of the study

C) Duration of the study

D) The presence of an absolute number of patients and clinical outcomes in the studies

E) + The duration of the observation period for patients is short

257. WHEN ASSESSING THE QUALITY OF CLINICAL TRIALS, TAKE INTO ACCOUNT:

A)+ Criteria for inclusion and exclusion of patients, information on compliance with the study protocol (for example, on the completeness of observation), description of the intervention and the results of blind evaluation of this intervention, characteristics of patients (prognostic factors)

B) Information on compliance with the study protocol (for example, on the completeness of observation), characteristics of patients (prognostic factors)

C) Characteristics of patients (prognostic factors), the criterion of inclusion and exclusion of patients does not matter

D) Compliance with the protocol of the study is not adhered to, the criterion for inclusion of patients, the place of the study

E) The place of the study, the characteristics of patients are distorted, the description of interventions

258. WHEN EVALUATING THE STUDY, PREFERENCE SHOULD BE GIVEN TO WORKS THAT CONTAIN:

A) Characteristics of patients (prognostic factors), the criterion of inclusion and exclusion of patients does not matter

B) Compliance with the protocol of the study is not adhered to, the criterion for inclusion of patients, the place of the study

C) The place of the study, the characteristics of patients are distorted, the description of interventions

D) +Information on compliance with the study protocol (for example, on the completeness of observation), criteria for inclusion and exclusion of patients, description of the intervention and the results of blind evaluation of this intervention, characteristics of patients (prognostic factors)

E) Compliance with the study protocols are not adhered to, criteria for inclusion and exclusion of patients, characteristics of patients

259. COMPARABILITY OF THE STUDIES INCLUDED IN THE META-ANALYSIS:

A) The studies included in the meta-analysis should be with different treatments and outcomes under consideration

B) +The studies included in the meta-analysis should be as homogeneous as possible in terms of the type of intervention, the composition of patients, and similar outcomes

C) All original studies should not contain information about factors that are important for the outcome (prognostic factors)

D) Meta-analysis usually includes data from descriptive studies only

E) Studies on the type of interventions are different and not comparable

260. IN ORDER TO EXCLUDE SYSTEM ERRORS WHEN SELECTING DATA FROM ORIGINAL STUDIES, IT IS NECESSARY:

A)+Participation in the selection of at least two self-employed authors

B) Participation in the selection of two authors working together

C) Participation in the selection of several authors performing different studies

D) Comparison of the results of different studies, in case of data discrepancy, the decision of the main author is made

E) Comparison of RCT and case-control results

261. TO SELECT DATA FROM ORIGINAL STUDIES, IT IS NECESSARY TO:

A) Compare the results of different studies, in case of data discrepancy, the decision of the main author is made

B) +Comparison of the results for each individual study, in case of discrepancy, an agreed decision is made, participation in the selection of at least two independently working authors, to develop a unified form and a standardized selection form

C) Participation in the selection of several authors performing different studies, the results of the study are not compared, to develop a unified form of selection

D) Develop a unified form and a standardized selection form, comparing the results of each study (RCT and cohort study)

E) Participation in the selection of at least two self-employed authors, the selection should be carried out according to their own methodology

262. SENSITIVITY ANALYSIS IS CARRIED OUT TO:

A) + check the degree of reliability of the conclusions of the meta-analysis

B) verification of the correctness of the choice of the research method

C) the reliability of the data obtained in descriptive studies

D) comparison of different research methods in chronic experiments

E) extracting data from the experiment

263. SENSITIVITY ANALYSIS IS CARRIED OUT IN THE FOLLOWING WAY:

A) Checking the correctness of the choice of the research method

B) Comparison of different research methods in acute experiments

C)+ Inclusion and exclusion of studies with a low methodological level

D) Geometric progress

E) inclusion of the largest studies in the meta-analysis

264. TO CONDUCT SENSITIVITY ANALYSIS, THE FOLLOWING METHODS ARE USED:

A) + Changing the parameters of the data selected from each study, excluding the largest studies from the meta-analysis, including and excluding studies with a low methodological level

B) Inclusion of globally large studies in the meta-analysis, inclusion of studies with a high methodological level

C) Inclusion and exclusion of large studies in RCTs, with different observation periods, data changes

D) Changing the parameters of data taken from one study, excluding the smallest studies from the RCT

E) Exclusion of mathematical data from cohort studies, the methodological level is low

265. DEFINE CLINICAL AUDIT:

A)+Comprehensive and independent verification of research-related activities and documentation conducted to confirm compliance with these activities

B) Scientific work carried out according to a pre-planned methodology to clarify scientific data

C) A scientific work where the object of study is the results of a number of original studies on the same problem

D) Small randomized trials with conflicting results and an average probability of error.

E) Cohort study of the laboratory, to confirm the data

266. CLINICAL AUDIT IS:

A) Scientific work carried out according to a pre-planned methodology to clarify scientific data

B)+ procedure for collecting, analyzing and presenting data to the protocol, sponsor's standard operating procedures, good Clinical Practice (GCP) and regulatory requirements

C) Verification of documentation to clarify the correctness of the selected research methods

D) A comprehensive study of the laboratory, to pass the stages of research

E) Small randomized trials with conflicting results and an average probability of error.

267. THE PURPOSE OF THE AUDIT IS:

A) Large randomized trials with unambiguous results and minimal probability of error

B) Small randomized trials with contradictory results and an average probability of error.

C) Non-randomized retrospective controlled trials

D) +Carrying out various procedures in order to ensure that the safety of the research is ensured and the rights of the research subjects are respected

E) Conducting cohort studies to confirm the data

268. FORMULATE THE AUDIT TASK:

A)+The researcher and the research staff are sufficiently qualified, have the appropriate training to conduct the study, comply with the protocol and procedures of the study, work in the study, according to the requirements of the ICH GCP rules and official authorities

B) The data obtained in the course of a clinical trial are not reliable and are not suitable for submission to official authorities

C) Researchers do not have the appropriate training to conduct research, are not familiar with the requirements of the ICH GCP rules and official authorities

D) Training of researchers in the rules of conducting research and maintaining documentation is not carried out

E) Recommendations for correcting identified comments and improving the quality of work are carried out by a third party

269. NAME THE AUDIT TASK:

A) +The work of clinical trial monitors is checked – that they perform their work correctly and in a timely manner, complying with the requirements of ICH GCP, sponsor, clinical trial protocol, local legislation and relevant standard operating procedures

B) Gives an exhaustive description of the epidemic process in statics and dynamics over the past period

D) Rapid identification of the fact of changes in the current level of morbidity.

E) Researchers do not have the appropriate training to conduct research, are not familiar with the requirements of the ICH GCP rules and official authorities

270. TYPES OF AUDITS:

A) Sectoral

B) +Internal

C) Hidden

D) Paired

E) Vector

271. WHAT TYPES OF AUDITS ARE THERE:

A) Sectoral

B) Open

C)+ External

D) Paired

E) Vector

272. WHICH AUDIT MEETS THE DEFINITION OF: IT IS AIMED AT VARIOUS ASPECTS OF THE CLINICAL TRIAL, I.E. THE ACTIVITIES OF THE SPONSOR'S OR CRO'S EMPLOYEES DIRECTLY INVOLVED IN THE PROCESS OF ORGANIZING, CONDUCTING AND CONTROLLING THE CLINICAL TRIAL CAN BE CHECKED

A) Sectoral

B) Diagram

C) Hidden audit

D) Closed audit

E)+ Audit of the organization

273. WHICH AUDIT MEETS THE DEFINITION OF: ENSURING THE QUALITY ASSURANCE OF THE ACTIVITIES OF THE STAFF OF THE RESEARCH CENTER – THE DIRECT LOCATION OF THE CLINICAL TRIAL

A) Sectoral

B)+ Audit of the research center
C) Audit of a closed farm
D) Paired
E) Vector audit

274. AUDIT OF A RESEARCH CENTER HAPPENS:
A)+ Planned, unplanned
B) Planned, closed
C) Unplanned, open
D) Closed, educational
E) Production, educational

275. WHAT SHOULD A QUALIFIED AUDITOR KNOW?
A) +He must know the requirements of the official authorities and the rules of the ICH GCP, the sponsor's procedures and the protocol of the study
B) He must know the laws of the world
C) He must be able and know the laws of nature
D) He must use intuition
E) He must use his skills

276. WHAT SHOULD A QUALIFIED AUDITOR BE ABLE TO DO?
A) He should know the requirements of the world market, sponsor procedures and protocol
B) He must know the world laws of business and the skills of a businessman
C) He is dependent on the enterprise and has knowledge of the law of nature
D)+ Be able to develop an audit plan, identify and resolve problems related to conducting research, give business advice
E) Be able to identify errors in case of technical problems

277. WHAT QUALITIES SHOULD A QUALIFIED AUDITOR POSSESS:
A) He should know the requirements of the world market, sponsor procedures and protocol

B) He must know the world laws of business and the skills of a businessman

C) He must be able and know the laws of nature

D) +Have sufficient knowledge about the investigational drug and possess the information contained in the researcher's brochure, have certain skills in order to assess the state of work in the research unit and the documentation of the study

E) Have sufficient knowledge about a person

278. RESEARCH CENTERS ARE MORE OFTEN AUDITED:

A) In which the smallest number of patients were included and/or these patients were included on a planned basis

B)+ In which the largest number of patients were included and/or these patients were included quickly

C) In which 2 patients were included and/or these patients were included randomly

D) In which the experimental group is recruited on a planned basis and at the choice of patients

E) In which the study was conducted behind schedule

279. AUDITS CAUSED BY A SPECIFIC REASON:

A) In which 2 patients were included and/or these patients were included accidentally

B) +Simultaneous participation of a researcher in several studies, especially with similar or almost identical inclusion/exclusion criteria

C) In which 2 patients were included and/or these patients were included randomly

D) In which the experimental group is recruited on a planned basis and at the choice of patients

E) A researcher participates in one experiment by chance

280. RESEARCH CENTERS ARE SUBJECT TO AUDIT:

A) In which the smallest number of patients were included and/or these patients were included on a planned basis

B)+ In which deviations from the protocol and research procedures, violations of the ICH GCP rules and current regulatory requirements are often recorded

C) In which 2 patients were included and/or these patients were included randomly

D) In which the experimental group is recruited on a planned basis and at the choice of patients

E) In which descriptive studies were conducted

281. A RESEARCHER WHO INCLUDES A LARGE NUMBER OF PATIENTS IN A SHORT PERIOD OF TIME (OR VERY QUICKLY, COMPARED TO OTHER RESEARCHERS) MAY MAKE MORE MISTAKES RELATED TO:

A)+ With the assessment of inclusion/exclusion criteria, when performing any protocol procedures, or simply not having time to collect complete and reliable data and comply with the requirements for maintaining clinical trial documentation.

B) With an assessment of the criteria for inclusion of respondents in the main and control groups, in cohort studies

C) The implementation of regulations in the treatment of patients

D) Compliance with ethical standards when communicating with people

E) With the assessment of students' knowledge

282. AUDITS CAUSED BY A SPECIFIC REASON (FOR CAUSE AUDIT):

A) During monitoring, sufficient quality (completeness) of primary medical documentation was revealed,

B) In the course of the study, all regulatory acts are defined

C)+ Simultaneous participation of a researcher in several studies, especially with similar or almost identical inclusion/exclusion criteria

D) In which a large percentage of positive phenomena is registered in comparison with other centers

E) In which 2 patients were included and/or these patients were included randomly

283. WHAT DOES NOT APPLY TO AN AUDIT CAUSED BY A SPECIFIC REASON (FOR CAUSE AUDIT):

A) In which deviations from the protocol and procedures of the study, violations of the ICH GCP rules and applicable regulatory requirements

are often recorded – the fulfillment of the above requirements is regulated by paragraphs 4.1.3 and 4.5 of ICH GCP and their non-compliance – direct the path to getting invalid data

B) Limited research experience, significant changes in the research team during its implementation

C) In which a large percentage of serious adverse events are registered in comparison with other centers

D) In which the researcher does not report at all or reports a small number of adverse events compared to other researchers

E)+ In which deviations from the protocol and procedures of the study, violations of the ICH GCP rules and current regulatory requirements are not recorded

284. CRITERIA FOR SELECTING A RESEARCH CENTER FOR AUDIT

A)+ Limited research experience, significant changes in the research team during its implementation, in which a large percentage of serious adverse events were registered compared to other centers

B) The experience of conducting the study is great, the researcher reports undesirable phenomena

C) In which 2 patients were included and/or these patients were included randomly, in which deviations from the protocols are not recorded

D) In which the experimental group is recruited on a planned basis and according to the choice of patients, the experience of conducting the study is small

E) The researcher participates in one experiment by chance, reports undesirable phenomena

285. RESEARCH CENTERS ARE NOT SUBJECT TO AUDIT MORE OFTEN

A) In which there are no errors and they work correctly

B) Limited research experience, significant changes in the research team during its implementation, in which a large percentage of serious adverse events were registered compared to other centers

C) Insufficient quality (completeness) of primary medical documentation identified during monitoring

D)+ In which the experimental group is recruited on a planned basis and by the choice of patients

E) In which a large percentage of serious adverse events are registered in comparison with other centers

286. A TYPE OF FALSE DATA DURING THE AUDIT:

A) Lost data

B)+ Modified data

C) Methodological data

D) Screening data

E) Systematic data

287. ENTER FALSE DATA

A) Lost data

B) Methodological data

C)+ Missing data

D) Screening data

E) Statistical data

288. WHICH TYPE OF THE ABOVE IS FALSE DATA?

A) Lost data

B) Archived data

C) Methodological data

D) Screening data

E) +Fabricated data

289. THE AUDIT REPORT IS:

A) An oral agreement between the auditor and the researcher

B) Written conclusions of the auditor on the achievements of the sponsor

C)+»A written opinion on the audit results drawn up by the sponsor's auditor»

D) A letter of thanks to the auditor from the researcher

E) Thanks to the team who successfully passed the exam

290. THE CHANGED DATA IS:

A)+ Obtaining inaccurate or changing data that was obtained appropriately, for example, disclosure of the treatment code or modification of laboratory data

B) Failure to report data that may affect the results of the study, for example, failure to report or «underestimate» serious adverse events

C) Providing fictitious information or results without doing real work

D) Providing the results of a physical examination without performing these examinations

E) Data that may affect the course of the study

291. MISSING DATA IS:

A) Obtaining inaccurate or changing data that was obtained appropriately, for example, disclosure of the treatment code or changing laboratory data

B)+ Failure to report data that may affect the results of the study, for example, failure to report or «underestimate» serious adverse events

C) Providing fictitious information or results without doing real work

D) Providing the results of a physical examination without performing these examinations

E) Data that may affect the course of the study

292. FABRICATED DATA IS:

A) Obtaining inaccurate or changing data that was obtained appropriately, for example, disclosure of the treatment code or changing laboratory data

B) Failure to report data that may affect the results of the study, for example, failure to report or «underestimate» serious adverse events

C)+ Providing fictitious information or results without performing real work, for example, filling in blood pressure values in the IRC, physical examination results without performing these examinations

D) Providing the results of an antropogenic examination without performing research

E) Data that may affect the course of the study

293. THE MOST IMPORTANT ERRORS DURING THE AUDIT:

A) + Significant inconsistency with the ICH GCP rules and significant errors in the research data (major findings) – urgent measures are required to resolve them

B) A method that provides a mathematical expression of the combined effect of several variables on the result

C) Quantitative analysis of the combined results of several studies of the same intervention.

D) A procedure that ensures the random distribution of patients into the main and control groups

E) The procedure ensuring the distribution of patients into the main and control groups

294. CLASSIFICATION OF AUDIT FINDINGS DEPENDING ON THEIR DEGREE OF IMPORTANCE:

A) Significant quantitative analysis of the combined results of several studies of the same intervention.

B) A method that provides a mathematical expression of the combined effect of several variables on the result

C) +Minor errors in the organization of the work of monitors and researchers (minor findings) – measures are required to resolve them

D) A procedure that ensures the random distribution of patients into the main and control groups

E) Proper use of medicines

295. THE FACTOR DETERMINING THE LEVEL OF EVIDENCE OF THE RECOMMENDATION:

A)+ Type (design) of research (most often optimal design – RCT)

B) Types of sequence in research

C) Types of data reliability levels

D) The type of selected animals

E) The number of animals in the studies

296. WHAT FACTOR DETERMINES THE LEVEL OF EVIDENCE OF A RECOMMENDATION

A) Architectural design

B) Types of sequence in research
C) Types of data reliability levels
D) The type of selected animals
E) +The number of studies and the number of patients included (meta-analysis is often needed)

297. TO DETERMINE THE LEVEL OF EVIDENCE OF THE RECOMMENDATION, IT IS NECESSARY:
A) Monotony of data
B) Reliability of results
C) Hypochromic results
D)+ Clinical significance of the effect
E) Animal heterozygosity

298. A FACTOR DETERMINING THE LEVEL OF EVIDENCE OF A RECOMMENDATION IN CLINICAL TRIALS:
A) Monotony of data
B) Reliability of results
C) Hypochromic results
D) Laboratory effect of the study by 50%
E)+ Applicability (portability, generalizability) of the research results to the population of interest

299. WHAT IS RELATED TO THE LEVEL OF EVIDENCE I A:
A) Evidence based on the results of at least one randomized controlled trial
B) Evidence based on the results of at least one correctly constructed controlled trial without randomization
C) Evidence based on the results of at least one correctly constructed experimental study
D)+ Evidence based on meta-analysis data, randomized controlled trials
E) Evidence based on the results of properly constructed non-experimental studies

300. THE LEVEL OF EVIDENCE I B IS:

A)+ Evidence based on the results of at least one randomized controlled trial

B) Evidence based on the results of at least one correctly constructed controlled trial without randomization

C) Evidence based on the results of at least one correctly constructed experimental study

D) Evidence based on meta-analysis data, randomized controlled trials

E) Evidence based on the results of properly constructed non-experimental studies

301. LEVEL OF EVIDENCE I I A IS:

A) Evidence based on the results of at least one randomized controlled trial

B) +Evidence based on the results of at least one correctly constructed controlled trial without randomization

C) Evidence based on the results of at least one correctly constructed experimental study

D) Evidence based on meta-analysis data, randomized controlled trials

E) Evidence based on the results of properly constructed non-experimental studies

302. LEVEL OF EVIDENCE I I B IS:

A) Evidence based on the results of at least one randomized controlled trial

B) Evidence based on the results of at least one correctly constructed controlled trial without randomization

C)+ Evidence based on the results of at least one correctly constructed experimental study

D) Evidence based on meta-analysis data, randomized controlled trials

E) Evidence based on the results of properly constructed non-experimental studies

303. LEVEL OF EVIDENCE IV IS:

A) Evidence based on the results of at least one randomized controlled trial

B) Evidence based on the results of at least one correctly constructed controlled trial without randomization

C) Evidence based on the results of at least one correctly constructed experimental study

D) Evidence based on meta-analysis data, randomized controlled trials

E) + Evidence based on the reports of the expert committee and the opinion and/or clinical experience of well-deserved authorities

304. DEFINE THE GRADATION OF RECOMMENDATIONS A

A) + At least one randomized controlled trial of good quality is required for a specific recommendation (grade I a, I b).

B) A properly conducted clinical trial is required, but not randomized clinical trials (degrees of proof II a, II b, III)

C) Evidence is required based on the reports of the expert committee and the opinion and/or clinical experience of well-deserved authorities (degree of evidence IV)

D) Indicates the absence of good quality clinical trials on this question

E) All levels of evidence

305. GRADATION OF RECOMMENDATIONS IN

A) At least one randomized controlled trial of good quality is required for a specific recommendation (grade I a, I b).

B) + Requires a properly conducted clinical trial, but not randomized clinical trials (degrees of proof II a, II b, III)

C) Requires evidence based on the reports of the expert committee and the opinion and/or clinical experience of well-deserved authorities (degree of evidence IV)

D) Indicates the absence of good quality clinical trials on this issue

E) All levels of evidence

306. TAKING INTO ACCOUNT THE LEVEL OF EVIDENCE, THE GRADING OF RECOMMENDATIONS C IS:

A) At least one randomized controlled trial of good quality is required for a specific recommendation (grade I a, I b).

B) A properly conducted clinical trial is required, but not randomized clinical trials (degrees of proof II a, II b, III)

C) +Proof is required based on the reports of the expert committee and the opinion and/or clinical experience of well-deserved authorities (degree of evidence IV)

D) Indicates that clinical trials are not of good quality on this issue (grades I B and II B).

E) All levels of evidence

307. THE CREDIBILITY OF THE RECOMMENDATION ON THE EXPEDIENCY OF USING MEDICAL TECHNOLOGY BELONGS TO CATEGORY A, IF THEY ARE CONFIRMED BY THE RESULTS:

A)+ Large randomized trials with unambiguous results and minimal probability of error

B) Small randomized trials with contradictory results and an average probability of error.

C) Non-randomized retrospective controlled trials

D) Non-randomized retrospective controlled trials

E) Uncontrolled studies

308. EVIDENCE BASED ON THE REPORTS OF THE EXPERT COMMITTEE AND THE OPINION AND/OR CLINICAL EXPERIENCE OF WELL-DESERVED AUTHORITIES REFERS TO THE LEVEL OF EVIDENCE:

A) Level of evidence I

B)+ Level of evidence IV

C) Level of evidence II b

D) Level of evidence IIV D

E) Level of evidence III C

309. EVIDENCE BASED ON THE RESULTS OF PROPERLY CONSTRUCTED NON-EXPERIMENTAL STUDIES, SUCH AS COMPARATIVE, CORRELATION STUDIES AND CASE DESCRIPTIONS REFERS TO THE LEVEL OF EVIDENCE:

A) Level OF evidence I

B) Level of evidence IV

C) Level of evidence II b

D) Level of evidence IIV

E) + Level of evidence III

310. EVIDENCE BASED ON THE RESULTS OF AT LEAST ONE CORRECTLY CONSTRUCTED EXPERIMENTAL STUDY REFERS TO THE LEVEL OF EVIDENCE:

A) Level of evidence I
B) Level of evidence IV
C) +Level of evidence II b
D) Level of evidence IIV
E) Level of evidence III

311. EVIDENCE BASED ON THE RESULTS OF AT LEAST ONE CORRECTLY CONSTRUCTED CONTROLLED TRIAL WITHOUT RANDOMIZATION REFERS TO THE LEVEL OF EVIDENCE:

A) Level of evidence I
B) Level of evidence IV
C) Level of evidence II b
D)+ Level of evidence II a
E) Level of evidence III C

312. EVIDENCE BASED ON THE RESULTS OF AT LEAST ONE RANDOMIZED CONTROLLED TRIAL REFERS TO THE LEVEL OF EVIDENCE:

A)+ Level of evidence I b
B) Level of evidence IV
C) Level of evidence II b
D) Level of evidence II a
E) Level of evidence III C

313. EVIDENCE BASED ON META-ANALYSIS DATA FROM RANDOMIZED CONTROLLED TRIALS REFERS TO THE LEVEL OF EVIDENCE:

A) Level OF evidence I b
B) Level of evidence IV
C) Level of evidence II b
D) + Level of evidence I a
E) Level of evidence III C

314. INDICATE THE IMPORTANCE OF THE FORMULATION OF A HYPOTHESIS IN THE STUDY:

A) + Formulation of a hypothesis before the start of the study

B) Formulation of a hypothesis during the study period

C) Formation of a hypothesis at the end of the study

D) The formation of a hypothesis throughout the study

E) There is no need to form a hypothesis

315.SPECIFY THE HIERARCHY OF EVIDENCE OF THE RESULTS IN THE PYRAMID OF EVIDENCE:

A) + Meta-analysis, RCT, cohort studies

B) Descriptive studies, randomized controlled trials

C) Analytical studies (cohort, case), meta-analysis, RCT

D) Descriptive studies, experimental studies, meta-analysis

E) RCT, descriptive studies, case-control

316. FOR WHAT PURPOSE IS THE META-ANALYSIS CARRIED OUT:

A) + Allows to evaluate the comparative effectiveness of any treatment method or to determine the total effect of several drugs of similar action

B) Does not allow to establish important side effects of the studied drug

C) Does not provide complete information about the studied drug

D) Increases the number of unjustified medical appointments

E) Reduces the quality of medicines

317. WHAT TYPES OF STUDIES ARE INCLUDED IN THE META-ANALYSIS:

A)+ Data from randomized clinical trials

B) Data of scientific publications in non-censored journals

C) Data of scientific publications in domestic journals

D) Disease prevalence monitoring data

E) Data from unreliable publications

318. FOR WHAT PURPOSE IS META-ANALYSIS USED IN PHARMACOTHERAPY?

A) + Allows you to determine with high accuracy the important side effects of the studied drug

B) Does not allow to establish important side effects of the studied drug

C) Does not provide complete information about the studied drug

D) Increases the number of unjustified medical appointments

E) Reduces the quality of medicines

319. HOW MANY SYSTEMATIC REVIEWS ARE CURRENTLY AVAILABLE IN THE COCHRANE LIBRARY:

A) 100

B) 350

C)+ 716

D) 800

E) 1000

320. AN AUDIT CONDUCTED BY AN INDEPENDENT THIRD PARTY, I.E. EMPLOYEES OF THE QA DEPARTMENT OF ANOTHER CRO, WHO NO LONGER TOOK ANY PART IN THE ORGANIZATION AND CONDUCT OF THIS STUDY IS:

A) Internal audit

B) Audit of the research center

C) +External audit

D) Audit of the organization

E) Organization – dependent audit

321. MEDLINE IS A DATABASE THAT CONTAINS...

A) Full texts of all journal articles published since 1966

B) Abstracts of all journal articles on medicine published since 1966;

C) Charts of medical history outcomes and meta-analyses;

D) Bibliographic references to the majority of journal articles on medicine published since 1966, and for about a third of them are abstracts;

E) all the answers are wrong

322. A SIMPLE EXAMPLE OF A CASE REPORT STUDY MIGHT BE
A) +Medical history
B) Reporting documentation of a medical organization
C) Statistical coupon
D) Orders
E) Emergency notices

323. WHAT IS PREVALENCE?
A) +prevalence of the disease
B) soreness
C) pathological lesion
D) morbidity
E) mortality

324. WHAT IS AN INCIDENT?
A) the prevalence of the disease
B) soreness
C) pathological lesion
D) +morbidity
E) disability

325. WHAT IS A CUMULATIVE INCIDENT?
A)+ the number of cases for the entire observation period divided by the sample size
B) the number of cases divided by the number of days
C) the number of cases for the entire observation period divided by the general population
D) the number of cases divided by all participants in the study
E) the number of sick patients.

326. WHAT ARE THE PURPOSES OF USING THE 2 X 2 TABLE.
A)+ for diagnostic purposes
B) identify risk factors
C) to determine the clinical outcome for cohort studies
D) to determine the risk of developing the disease for the case-control study
E) determine the prognosis of the disease.

327. WHAT IS THE SENSITIVITY OF A DIAGNOSTIC TEST?

A) + the probability of a positive diagnostic test result in the presence of a disease

B) the probability of a positive diagnostic test result in the absence of the disease

C) the probability of a positive diagnostic test result

D) the probability of a negative result of a diagnostic test in the presence of a disease

E) the probability of a negative result of the diagnostic test in the absence of the disease.

328. WHAT IS THE SPECIFICITY OF A DIAGNOSTIC TEST?

A) the probability of a positive result of a diagnostic test in the presence of a disease

B) the probability of a positive diagnostic test result in the absence of the disease

C) the probability of a positive diagnostic test result

D) the probability of a negative result of a diagnostic test in the presence of a disease

E)+ the probability of a negative diagnostic test result in the absence of illness.

329. WHAT IS THE PRETEST PROBABILITY?

A) + a priori probability of having a disease regardless of the test result

B) a priori probability of the disease in the absence of a positive diagnostic test result

C) the probability of the absence of the disease in the presence of a positive diagnostic test result

D) the probability of disease

E) the probability of a fatal outcome.

330. WHAT IS THE LIKELIHOOD RATIO?

A)+ the ratio of the probability of getting a positive test result in patients to the probability of getting a positive result in healthy

B) the ratio of the probability of getting a negative test result in patients to the probability of getting a negative result in healthy

C) the ratio of the probability of getting any test result in patients to the probability of getting any result in healthy

D) the ratio of the probability of getting a positive test result in patients to the probability of getting a negative result in healthy

E) the ratio of the probability of getting a negative test result in patients.

331. WHAT IS THE PROGNOSTIC VALUE?

A) + the probability of having a disease with a known result of a diagnostic test

B) the probability of getting a positive test result in patients

C) the probability of disease with any test result in patients

D) the probability of the disease with a positive test result in patients

E) the probability of the disease.

332. WHAT IS THE ODDS RATIO?

A)+ the ratio of the chances of developing the disease among the exposed population to the chances of developing the disease in the non-exposed population

B) the ratio of the chances of developing the disease in the population

C) the chance of developing the disease in the affected population

D) the chance of developing the disease in a non-exposed population

E) the probability of disease

333. WHAT IS THE PREDICTIVE VALUE OF A NEGATIVE RESULT?

A) the probability of having a disease with a known result of a diagnostic test

B)+ the probability of absence of the disease with a negative test result

C) the probability of disease with any test result in patients

D) the probability of the disease with a positive test result in patients

E) the probability of disease

334. WHAT IS THE PREDICTIVE VALUE OF A POSITIVE RESULT?

A) the probability of having a disease with a known result of a diagnostic test

B) the probability of getting a positive test result in patients

C) the probability of disease with any test result in patients

D) + the probability of the disease with a positive test result in patients

E) the probability of a fatal outcome.

335. WHAT IS RELATIVE RISK?

A)+ morbidity ratio among persons exposed and not exposed to treatment or risk factors

B) the ratio of morbidity of persons not exposed and treated or risk factors

C) the ratio of the number of persons with the probability of disease to the number of persons without the probability of disease

D) the ratio of the number of persons with diseases to the number of persons without disease

E) the probability of a fatal outcome.

336. WHAT EXPRESSES THE REDUCTION OF RELATIVE RISK?

A)+ relative decrease in the frequency of adverse outcomes in the treatment group compared to the control group

B) a relative decrease in the incidence of persons who are not exposed compared to those who have been treated or risk factors

C) a relative decrease in the number of persons with the probability of disease compared to the number of persons without the probability of disease

D) a relative decrease in the number of people with diseases compared to the number of people without the disease

E) the probability of a fatal outcome.

337. WHAT EXPRESSES AN INCREASE IN RELATIVE RISK?

A)+ relative increase in the frequency of adverse outcomes in the treatment group compared to the control group

B) a relative increase in the incidence of persons not exposed compared to those treated or risk factors

C) the relative increase in the number of persons with the probability of disease compared to the number of persons without the probability of disease

D) relative increase in the number of people with diseases compared to the number of people without the disease

E) the probability of a fatal outcome.

338. WHAT EXPRESSES AN INCREASE IN RELATIVE BENEFIT?

A)+ relative increase in the frequency of favorable outcomes in the treatment group compared to the control group

B) a relative increase in the incidence of persons not exposed compared to those treated or risk factors

C) the relative increase in the number of persons with the probability of disease compared to the number of persons without the probability of disease

D) relative increase in the number of people without diseases compared to the number of people with diseases

D the probability of a fatal outcome.

339. ONE OF THE TYPES OF ABSOLUTE DIFFERENCES IS.

A)+ increase in absolute risk

B) reduction of absolute benefit

C) increase in relative benefit

D) absolute risk

E) the probability of a fatal outcome.

340. ONE OF THE TYPES OF ABSOLUTE DIFFERENCES IS.

A)+ increase in absolute benefit

B) absolute risk

C) increase in relative benefit

D) reduction of absolute benefit

E) the probability of a fatal outcome.

341. ONE OF THE TYPES OF ABSOLUTE DIFFERENCES IS.

A) + reduction of absolute risk

B) absolute risk

C) increase in relative benefit

D) reduction of absolute benefit

E) the probability of a fatal outcome.

342. INDEX OF POTENTIAL HARM.

A) +the number of patients who should receive experimental treatment so that one additional patient develops an unfavorable outcome, compared with patients from the control group

B) the number of patients who should receive experimental treatment in order for one additional patient to develop a favorable outcome, compared with patients from the control group

C) the number of patients who should receive experimental treatment so that one patient from the comparison group develops an unfavorable outcome

D) the number of patients who should receive experimental treatment so that one patient in the experimental group develops a favorable outcome

E) the probability of a fatal outcome.

343. WHAT IS CBNL?

A)+ the number of patients who need to be treated with a certain method for a certain time in order to prevent an unfavorable outcome in one patient

B) the number of patients who need to be treated so that one additional patient develops a favorable outcome, compared with patients from the control group

C) the number of patients who need to be treated so that one patient from the comparison group develops an unfavorable outcome

D) the number of patients who need to be treated so that one patient in the experimental group develops a favorable outcome

E) the probability of a fatal outcome.

344. WHAT FORMULAS FOR CALCULATING THE SAMPLE EXIST?

A)+ fast formulas (Lehr formula)

B) formulas for calculating the average of the total population

C) 20% of the total population

D) 30% of the total population

E) 10% of the total sample.

345. WHAT FORMULAS FOR CALCULATING THE SAMPLE EXIST?

A)+ Altman nomogram

B) formulas for calculating the average of the total population

C) 20% of the total population

D) 30% of the total population

E) 1% of the general sample.

346. WHAT FORMULAS FOR CALCULATING THE SAMPLE EXIST?

A)+ using computer software

B) formulas for calculating the average of the total population

C) 20% of the total population

D) 30% of the total population

E) 1% of the general sample.

347. WHAT IS THE CONFIDENCE INTERVAL AND THE LEVEL OF SIGNIFICANCE, THE CONCEPT.

A) + a range of values, within which the true parameter of the population usually lies with 95% confidence

B) the range of values within which the true parameter of the population usually lies with 50% confidence

C) the range of values within which the true parameter of the population usually lies with 10% confidence

D) a range of values within which a false population parameter usually lies with 50% confidence

E) a range of values within which a false population parameter usually lies with 0.5% confidence

348. EVIDENCE-BASED MEDICINE IS:

A)+ conscientious, accurate and meaningful use of the best results of clinical research to choose the treatment of a particular patient and a new technology for collecting, critical analysis, generalization and interpretation of scientific information.*

B) generalization and interpretation of clinical data.

C) independent medical science is one of the most difficult subjects of medical education.

D) the health of the population due to the complex impact of social and biological environmental factors.

E) the theoretical basis of Soviet healthcare.

349. INDICATE WHO AND WHEN FIRST PROPOSED THE TERMINOLOGY – «EVIDENCE-BASED MEDICINE» (EVM) OR «EVIDENCE-BASED MEDICINE» (NDM):

A) + in 1990, a group of Canadian scientists from McMaster University;

B) in 1992, a group of Canadian scientists from McMaster University;

C) in 1993, a group of Canadian scientists from McMaster University;

D) in 1990, a group of scientists from the University of Oxford.

E) in 1992, a group of Soviet scientists from Lomonosov University.

350. SPECIFY THE CORRECT DEFINITION OF EVIDENCE-BASED MEDICINE:

A) + accessible, concise and objective information about the best and reliable results of clinical trials conducted worldwide and objectively proving the benefits of a particular treatment method or drug*

B) the research method for choosing the treatment of a particular patient.

C) the health of the population due to the complex impact of social and biological environmental factors.

D) the theoretical basis of Soviet healthcare.

E) collection of critical analyses in the interpretation of scientific information

351. SPECIFY THE NECESSARY PREREQUISITES FOR THE USE OF THE EVIDENCE SYSTEM:

A) It should always be remembered that the recovery of the patient depends on the qualifications of the doctor.

B)+ The number of observed patients is often too small to draw far-reaching conclusions.

C) There is inconsistency in the results and conclusions of clinical trials.

D) There is a benevolence of the results and the conclusion of clinical trials.

E) to implement the results of the cohort study evaluation into clinical practice.

352. INDICATE WHICH OF THE FOLLOWING ARE THE MAIN ASPECT OF DM:

A) Critically evaluate evidence-based information in the economy;

B) To identify the best reasonable information for diagnosis;

C)+ Critically evaluate evidence-based information for reliability and usefulness and identify the best substantiated information to answer questions;

D) To identify the best results of clinical trials;

E) to identify the best results of epidemiology.

353. SPECIFY THE ELEMENTS OF THE ALGORITHM FOR THE USE OF EVIDENCE-BASED MEDICINE;

A)+ Formulation of the problem;

B) Conducting a search for information – literature data on this problem;

C) Assessment of scientific evidence (reliability) and usefulness of information;

D) Making a clinical diagnosis;

D sanitary treatment.

354. NAME THE ELEMENTS OF THE ALGORITHM FOR THE USE OF EVIDENCE-BASED MEDICINE:

A) + Application in practice and /or dissemination (publication) of the results obtained;

B) formation of databases of systematic reviews of randomized controlled trials;

C) development of clinical recommendations;

D) medical data design;

E) data from a sample study.

355. SPECIFY THE CORRECT STEPS OF EVIDENCE-BASED MEDICINE:

A) + The right question to which an answer is possible;

B) Critical assessment of information;
C) Literary review;
D) Journal review;
E) Newspaper review.

356. INDICATE WHICH OF THE FOLLOWING ARE THE CORRECT DM STEPS:
A) Internet overview;
B) Internet resources;
C) all the answers are correct;
D) +Search for information (evidence);
E) Integration of the received information with the known features of the patient.

357.SPECIFY IN STEP 1 – FORMULATION OF PROBLEMS OF EVIDENCE-BASED MEDICINE:
A)+ What is the probability of re-exacerbation and the prognosis of the patient?
B) Which diagnostic models are optimal for this pathology?
C) What is the effectiveness or safety of various therapy options?
D) denial of the question what to do?
E) antitherapy.

358. WHAT IS NOT AN EXAMPLE OF UNREASONABLE TRADITIONAL APPROACHES TO THE USE OF COMMON MEDICINES:
A) The use of antimicrobial agents (antibiotics, sulfonamides) in acute respiratory viral infections;
B) Parenteral administration of vitamin preparations for the purpose of auxiliary treatment of diseases of internal organs;
C) The appointment of means of metabolic correction of the energy metabolism of the ischemic myocardium;
D)+ traditional medicine;
E) the use of so-called hepatoprotectors for the treatment of cirrhosis of the liver

359. WHAT ARE THE EXAMPLES OF UNJUSTIFIED TRADITIONAL APPROACHES TO THE USE OF COMMON MEDICINES:

A)+ The use of so-called hepatoprotectors for the treatment of cirrhosis of the liver;

B) cosmetology medicine

C) traditional medicine

D) herbal medicine;

E) Tibetan medicine

360. SPECIFY HOW YOU CAN SEARCH FOR LITERARY DATA:

A) + Scrolling, in which the pages are skimmed in search of the material of interest;

B) photographing the material of interest;

C) video surveillance of the material of interest;

D) referencing of the material of interest;

E) writing data

361. THE SEARCH FOR LITERARY DATA IS:

A)+ Scrolling, in which the pages are skimmed in search of the material of interest;

B) Reading for information, in which the literature is looking for an answer to a specific question, usually related to a problem relevant to the reader;

C) Reading is a study in which a purposeful search is carried out to form a comprehensive view of knowledge, ignorance and uncertainty in the relevant field;

D) writing an essay;

E) video surveillance of the material of interest

362. SPECIFY THE CORRECT ITEMS IN THE SEARCH FOR LITERARY DATA:

A)+ Reading for information, in which the literature is looking for an answer to a specific question, usually related to a problem relevant to the reader;

B) Scrolling, in which the pages are skimmed in search of the material of interest;

C) Video surveillance of the material of interest;
D) Referencing of the material of interest;
E) Reading – research

363. SPECIFY THE CORRECT SOURCES OF SCIENTIFIC EVIDENCE:
A) + The database of the Cochrane Library in Russia on disks or (www.cochrane.ru);
B) Publications in the periodical medical press, including international medical journals», «Evidence-based medicine»;
C) Only in domestic literatures;
D) Only in fiction;
E) only in fairy tales.

364. NAME THE SOURCES OF SCIENTIFIC EVIDENCE:
A) + Internet DARE, MEDLINE www.ncbi.nlm.nih.gov/Entrez/medline.html , EMBASE;
B) archival sources;
C) statistical indicators;
D) in the Legislative materials;
E) all the answers are wrong.

365. MEDLINE IS A DATABASE THAT CONTAINS...
A) Full texts of all journal articles published since 1966
B) Abstracts of all journal articles on medicine published since 1966;
C) Charts of medical history outcomes and meta-analyses;
D)+ Bibliographic references to the majority of journal articles on medicine published since 1966, and for about a third of them are abstracts;
E) Bibliographic references to the majority of journal articles on medicine published since 1976, and for about a third of them are abstracts;

366. WHICH OF THE LISTED REQUIREMENTS IS REQUIRED FOR THE DEVELOPMENT OF CLINICAL GUIDELINES
A)+ Reflect the optimal level of treatment and services
B) Reduce the quality of diagnosis, treatment, prevention and rehabilitation of patients

C) Reduce the volume of free guaranteed medical care

D) Ensure a reduction in the quality of medical care

E) Increase the irrational use of resources.

367. HOW MANY BASIC TYPES OF CLINICAL GUIDELINES HAVE BEEN DEVELOPED.

A)+ The New Zealand Clinical Guidelines Development Group has identified 5 main types of guidelines

B) 3 types of clinical guidelines have been developed

C) The New Zealand Clinical Guidelines Development Group has identified 10 main types of guidelines

D) 12 basic and additional types of clinical guidelines have been developed

E) Clinical guidelines are not divided by type.

368. WHICH OF THE FOLLOWING CHARACTERISTICS RELATE TO EVIDENCE-BASED GUIDELINES (KIND):

A) are being developed in order to reduce the volume of medical care

B) cannot clearly separate opinions from evidence

C) + calculate the absolute difference in outcomes, including both positive results and negative manifestations

D) calculate the absolute difference in outcomes, including only a negative result

E) calculate the absolute difference in outcomes, including only a positive result.

369. WHAT IS THE DIFFERENCE BETWEEN EXPANDED EVIDENCE-BASED GUIDELINES AND OTHER TYPES OF CLINICAL GUIDELINES?

A)+ project the consequences that will bring changes in medical practice in a certain group of the population, for the health care system as a whole

B) calculate the absolute difference in outcomes, including only negative results

C) Reduce patient satisfaction with the quality of medical care

D) Provide a reduction in the quality of patient-centered medical care

E) Increase the irrational use of resources.

370. WHAT IS THE PRINCIPLE UNDERLYING THE DEVELOPMENT OF CLINICAL PRACTICE GUIDELINES?

A) The development process should not involve consumers

B) + The process of developing and evaluating guidelines should focus on the outcomes that are most important to consumers (quality of life indicators, survival rates)

C) Guidelines are developed without taking into account limited resources

D) Guidelines are developed in order to reduce the quality of technologies for prevention, diagnosis, treatment and rehabilitation of patients

E) Guidelines are being developed in order to reduce the volume of medical care

371. FOR WHAT PURPOSE ARE CLINICAL PRACTICAL GUIDELINES USED.

A) Improving the effectiveness of treatment costs

B) Decrease in the quality of treatment

C) A decrease in the level of education of doctors

D) Exclusion of clinical thinking

E) Reducing the effectiveness of treatment costs.

372. WHICH OF THE LISTED REQUIREMENTS ARE NOT REQUIRED FOR THE DEVELOPMENT OF CLINICAL GUIDELINES.

A) Reflect the optimal level of treatment and services

B) Ensure continuity and continuity in diagnosis, treatment, prevention, rehabilitation

C) Increase patient satisfaction with the quality of medical care

D) Improve the quality of medical care

E) + Increase the irrational use of resources.

373. HOW MANY BASIC TYPES OF CLINICAL GUIDELINES HAVE BEEN DEVELOPED.

A) + The New Zealand Clinical Guidelines Development Group has identified 5 main types of guidelines

B) 3 types of clinical guidelines have been developed

C) The New Zealand Clinical Guidelines Development Group has identified 10 main types of guidelines

D) 12 basic and additional types of clinical guidelines have been developed

E) Clinical guidelines are not divided by type.

374. WHICH OF THE FOLLOWING CHARACTERISTICS BELONG TO EVIDENCE-BASED GUIDELINES (GENUS).

A) + include a strategy for describing the significance of the evidence presented and try to clearly separate opinions from evidence

B) provide a reduction in the quality of patient-centered medical care

C) calculate the absolute difference in outcomes, including only negative results

D) calculate the absolute difference in outcomes, including only positive results.

E) are developed based on the results of the search for information in popular science literature

375. WHAT IS THE DIFFERENCE BETWEEN EXTENDED EVIDENCE-BASED GUIDELINES AND OTHER TYPES OF CLINICAL GUIDELINES.

A) + project the consequences that will bring changes in medical practice in a certain group of the population, for the health care system as a whole

B) calculate the absolute difference in outcomes, including only negative results

C) Reduce patient satisfaction with the quality of medical care

D) Provide a reduction in the quality of patient-centered medical care

E) Increase the irrational use of resources.

376. WHAT IS THE PRINCIPLE UNDERLYING THE DEVELOPMENT OF CLINICAL PRACTICE GUIDELINES?

A) The development process should not involve consumers

B)+ The process of developing and evaluating guidelines should focus on the outcomes that are most important to consumers (quality of life indicators, survival rates)

C) Guidelines are developed without taking into account limited resources

D) Guidelines are developed in order to reduce the quality of technologies for prevention, diagnosis, treatment and rehabilitation of patients

E) Guidelines are being developed in order to reduce the volume of medical care.

377. FOR WHAT PURPOSE ARE CLINICAL PRACTICAL GUIDELINES USED.

A) Exclusion of clinical thinking

B) Decrease in the quality of treatment

C) Reduced availability of medical care

D) + Increase in the effectiveness of treatment costs

E) Reducing the effectiveness of treatment costs.

378. AFTER WHAT PERIOD OF TIME IT IS RECOMMENDED TO CONDUCT AN AUDIT OF CLINICAL GUIDELINES AFTER IMPLEMENTATION INTO PRACTICE.

A) conducting an audit after the introduction of the CRC into practice is not necessary

B)+ audit is recommended to be carried out within two years after the introduction of the CRC into practice

C) the audit is carried out within 15 years after its introduction into practice

D) the audit is carried out within 10 years after its introduction into practice

E) the audit is carried out according to the wishes of the administration.

379. WHAT ARE THE ADVANTAGES OF EVIDENCE-BASED GUIDELINES:

A) +Clearly separate opinions from evidence

B) Give measurable differences in results, including only the negative sides

C) cannot be used for making clinical decisions

D) cannot separate opinions from evidence

E) cannot be used for practical healthcare planning.

380. WHAT ADVANTAGES DOES THE USE OF CLINICAL GUIDELINES ON THE BASIS OF EVIDENCE GIVE TO A DOCTOR:

A) excludes the possibility of using clinical thinking

B) makes it possible to use more expensive methods of diagnosis and treatment

C) excludes the possibility of using diagnostic and treatment methods based on evidence-based medicine

D)+ when encountering an emergency situation, a practitioner can always turn to the clinical management and prescribe treatment based on evidence-based medicine to the patient

E) makes it possible to use non-effective medicines.

381. FOR WHAT PURPOSE IS META-ANALYSIS USED IN PHARMACOTHERAPY?

A) + allows to determine with high accuracy the important side effects of the studied drug

B) does not allow to establish important side effects of the studied drug

C) does not provide complete information about the studied drug

D) increases the number of unjustified medical appointments

E) reduces the quality of medicines.

382. WHAT IS THE PURPOSE OF THE META-ANALYSIS?

A)+ allows you to evaluate the comparative effectiveness of any treatment method or determine the total effect of several drugs of similar action

B) does not allow to establish important side effects of the studied drug

C) does not provide complete information about the studied drug

D) increases the number of unjustified medical appointments

E) reduces the quality of medicines.

383. BY WHAT CHARACTERISTICS SHOULD THE STUDIES INCLUDED IN THE META-ANALYSIS BE SIMILAR

A) different types of medical intervention

B) different in the outcome of treatment

C)+ maximally homogeneous in terms of the type of medical intervention, the outcome of treatment, and the composition of patients.

D) similar research budgets

E) studies performed by only one author or a group of authors.

384. WHAT TYPES OF STUDIES ARE INCLUDED IN THE META-ANALYSIS.

A) +RCT data

B) data of scientific publications in non-censored journals

C) data of scientific publications in domestic journals

D) disease prevalence monitoring data

E) data from unreliable publications.

385. INDICATE WHICH OF THE FOLLOWING ITEMS RELATE TO CLINICAL GUIDELINES BASED ON EVIDENCE:

A)+ are developed based on the results of a systematic search and evaluation of information in the specialized literature

B) describe evidently unsubstantiated evidence and facts

C) cannot separate opinions from evidence

D) calculate the absolute difference in outcomes, including only a negative result

E) calculate the absolute difference in outcomes, including only a positive result

BIBLIOGRAPHIC LIST

1. Petrov V. I. Clinical pharmacology and pharmacotherapy in real medical practice: Master class. Textbook – M.: GEOTAR – Media, 2019 – 871 p.

2. Horwitz RI, Charlson ME, Singer BH. Medicine based evidence and personalized care of patients. Eur J Clin Invest. 2018 Jul;48(7):e12945.

3. Wivel AE, Lapane K, Kleoudis C, Singer BH, Horwitz RI. Medicine Based Evidence for Individualized Decision Making: Case Study of Systemic Lupus Erythematosus. Am J Med. 2017 Nov;130(11):1290-1297.e6.

4. Jefferson T, Doshi P, Boutron I, Golder S, Heneghan C, Hodkinson A, Jones M, Lefebvre C, Stewart LA. When to include clinical study reports and regulatory documents in systematic reviews. BMJ Evid Based Med. 2018 Dec;23(6):210-217.

5. Thakur H, Cohen JR. Depression screening in youth: Multi-informant algorithms for the child welfare setting. Psychol Assess. 2019 Aug;31(8):1028-1039.

6. García-Carrasco M, Mendoza-Pinto C, Rojas-Villarraga A, Molano-González N, Vallejo-Ruiz V, Munguía-Realpozo P, Colombo AL, Cervera R. Prevalence of cervical HPV infection in women with systemic lupus erythematosus: A systematic review and meta-analysis. Autoimmun Rev. 2019 Feb;18(2):184-191.

7. Harmonized ICH Guidelines. Integrated Supplement to ICH E6 (R1): Guide to Good Clinical Practice E6(R2). – 2016 https://ichgcp.ru.

8. Koretz RL. Assessing the Evidence in Evidence-Based Medicine. Nutr Clin Pract. 2019 Feb;34(1):60-72.

9. Babar ZU, Scahill S, Nagaria RA, Curley LE. The future of pharmacy practice research–perspectives of academics and practitioners from Australia, NZ, United Kingdom, Canada and USA. Res Soc Adm Pharm. 2018;14:1163–71.

10. Babar ZU. Global pharmaceutical policy. London: Palgrave Macmillan; 2020. (ISBN 978-981-15-2723-4).

11. Hermansyah A, Sainsbury E, Krass I. Investigating the impact of the universal healthcare coverage programme on community pharmacy practice. Health Soc Care Community. 2018;26(2):e249–60.

12. Collaboration O, Newton PN, Bond KC, Babar Z. COVID-19 and risks to the supply and quality of tests, drugs, and vaccines. Lancet Glob Health. 2020;8(6):e754–5.

13. Assessing national medicines regulatory systems. https://www.who.int/medicines/areas/quality_safety/regulation_legislation/assessment/en/. Accessed 30 Dec 2020.

14. Chan A, Darwish R, Shamim S, Babar ZUD. Pharmacy practice and continuing professional development in low and middle income countries (LMICs). In: Babar ZUD, editor. Pharmacy practice research case studies. Elsevier; 2021. (In Press)

TESTS FOR CONTROL

Test #1

1. The «gold standard» of medical research is called:
a) cross-sectional studies
b) single-blind study
c) randomized controlled trials
d) paired comparisons
The correct answer in

2. The method in which neither the patient nor the doctor observing him does not know which of the methods of treatment was used is called:
a) double blind
b) triple blind
c) single blind
d) placebo-controlled
The correct answer is a

3. A harmless inactive substance offered under the guise of a medicine that does not differ from it in appearance, smell, texture is called:
a) a dietary supplement
b) an analogue of the studied drug
c) a homeopathic drug
d) a placebo
The correct answer is g

4. Controlled trial, this study is:
a) retrospective
b) prospective
c) transverse
d) perpendicular
The correct answer is b

5. A study in which the patient does not know, and the doctor knows what treatment the patient is receiving, is called:
a) placebo

-controlled b) double blind
c) triple blind
d) simple blind
The correct answer is g

6. It can be argued that in a randomized controlled trial (RCT), patients receiving placebo are not deceived (do not receive proper treatment), due to the fact that:
a) the attending physician receives the oral consent of the patient to conduct the experiment
b) the patient signs the «Informed consent of the patient» (where his consent to the use of placebo is provided)
c) placebo does not have a harmful effect on the body, therefore its use does not require the consent of the patient
d) the patient signs a consent for hospitalization
The correct answer is b

7. A study with a randomly selected control group and the presence of influence from the researcher is called:
a) a randomized controlled clinical trial
b) a non-randomized study
c) an observational study
d) retrospective study
The correct answer is a

8. The concept of the «gold standard» includes:
a) double-blind placebo-controlled randomized trials
b) simple non-randomized trials
c) triple-blind trials
d) double-blind non-randomized trials
The correct answer is a

9. A study in which patients are randomly assigned to groups is called:
a) simple blind
b) non-randomized
c) placebo controlled

d) randomized
The correct answer is g

10. Conscious, clear and impartial use of the best available evidence when making decisions about helping specific patients, this is one of the definitions of:
a) biometrics
b) evidence-based medicine
c) clinical epidemiology
d) medical statistics
The correct answer is b

11. According to the method of selection of patients, studies distinguish:
a) random and complex
b) equally probable and impossible
c) randomized and not randomized
d) primary and tertiary
The correct answer in

12. Random selection of observations is called:
a) randomization
b) median
c) mode
d) probability
The correct answer is a

13. According to the degree of openness of the data, the study can be:
a) open or blind
b) closed or blind
c) open or randomized
d) randomized or multicenter
The correct answer is a

14. A clinical trial in which all participants (doctors, patients, organizers) know which drug is used in a particular patient is called:

a) non-randomized
b) randomized
c) simple blind
d) open
The correct answer is g

15. The pharmaceutical drug was tested on the basis of medical institutions in various cities of the Russian Federation, this study is:
a) general
b) multiple
c) polycentric
d) multicenter
The correct answer is g

Test 2

1. Biomedical mathematical statistics, is called:
a) biometrics
b) medical cybernetics
c) probability theory
d) biostatics
The correct answer is a

2. Groups of methods of medical statistics include:
a) comparative statistics
b) evidence-based statistics
c) health statistics
d) mathematical statistics
The correct answer is a

3. Descriptive statistics deals with:
a) comparison of the data obtained
b) a set of material
c) description and presentation of data
d) justification of the results obtained
The correct answer in

4. Data collection can be:
a) optimization
b) static and dynamic
c) constructive and deconstructive
d) passive and active
The correct answer is g

5. Comparative statistics allows:
a) to formulate conclusions in the form of hypotheses or forecasts
b) to conduct a comparative analysis of data in the study groups
c) conduct a data set in accordance with the principles of randomization
d) present the results to the audience
The correct answer is b

6. The science that develops methods of clinical research is called:
a) clinical epidemiology
b) pharmacy
c) cybernetics
d) medical statistics
The correct answer is a

7. The purpose of clinical epidemiology is:
a) the development of methods for statistical evaluation of clinical observations
b) the study of infectious morbidity
c) the development and application of effective methods of clinical research
d) prevention of epidemics and contagious diseases
The correct answer in

8. From the standpoint of evidence-based medicine, a doctor should make a decision about choosing a treatment method based on
a) information from the Internet
b) the experience of colleagues
c) articles from a peer-reviewed journal with a high citation index

d) articles from an unknown source
The correct answer in

9. The indicator characterizing the reliability of the information given in the scientific journal is:
a) confidence index
b) confidence index
c) significance index
d) citation index
The correct answer is g

10. One of the prerequisites for the emergence of evidence-based medicine was:
a) the limited financial resources allocated to healthcare
b) the emergence of new medical specialties
c) improvement of research methods
d) development of mathematical statistics
The correct answer is a

11. Mathematical science that establishes the regularities of random phenomena is:
a) medical statistics
b) probability theory
c) medical demography
d) higher mathematics
The correct answer is b

12. The possibility of implementing any event is:
a) experiment
b) scheme of cases
c) regularity
d) probability
The correct answer is g

13. The experiment is:
a) the process of accumulating empirical knowledge

b) the process of measuring or observing an action in order to collect data

c) the study covering the entire general population of observation units

d) mathematical modeling of reality processes

The correct answer is b

14. The outcome in probability theory is understood as:

a) an uncertain result of the experiment

b) a certain result of the experiment

c) the dynamics of the probabilistic process

d) the ratio of the number of observation units to the general population

The correct answer is b

15. The sample space in probability theory is:

a) the structure of the phenomenon

b) all possible outcomes of the experiment

c) the relationship between two independent aggregates

d) the relationship between two dependent aggregates

The correct answer is b

16. The fact that when a certain set of conditions is implemented, it may or may not happen:

a) frequency of occurrence

b) probability

c) phenomenon

d) event

The correct answer is g

17. Events that occur with the same frequency, and none of them is objectively more possible than the others:

a) random

b) equally

probable c) equivalent

d) selective

The correct answer is b

18. An event that, when certain conditions are met, will certainly occur is considered:

a) necessary
b) expected
c) reliable
d) priority
The correct answer in

19. The opposite in relation to a reliable event is an event:

a) unnecessary
b) unexpected
c) impossible
d) non-priority
The correct answer in

20. Probability of occurrence of a random event:

a) greater than zero and less than one
b) greater than one
c) less than zero
d) represented by integers
The correct answer is a

Educational publication

Vorobyeva Nadezda Alexandrovna
Shchapkov Alexey Andreevich

Evidence-based medicine in modern clinical practice: achievements and problems

Study guide

Издано в авторской редакции

Компьютерная верстка *Г.Е. Волковой*

Подписано в печать 10.05.2023.
Формат 60×84 1/16. Бумага офсетная.
Гарнитура Times New Roman. Печать цифровая.
Усл. печ. л. 11,9. Уч.-изд. л. 7,9.
Тираж 100 экз. Заказ № 2566

ФГБОУ ВО «Северный государственный медицинский университет»
163069, г. Архангельск, пр. Троицкий, 51
Телефон (8182) 20-61-90. E-mail: izdatelnsmu@yandex.ru