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AREAS AND BRANCHES OF MEDICINE, PHARMACOLOGY AND ITS CLASSIFICATION, TERMINOLOGY

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ABSTRACT: *This article discusses the activities and functions of the field of medicine, in particular the terminology and application of the field of pharmacology, which highlights the need and use of the field of pharmacology today.*

KEYWORDS: *Medicine, John Jacob Abel, Clinical practice, Surgery, Medical devices, Branches of medicine, Pharmacology, Pharmacodynamics-Pharmacodynamics, Clinical pharmacology, Pharmacokinetics, Toxicology.*

INTRODUCTION

Medicine is the field of health and healing. It includes nurses, doctors and various specialists. It covers the diagnosis, treatment and prevention of diseases, medical research and many other aspects of health. Medicine aims to promote and maintain health and well-being. Traditional modern medicine is sometimes referred to as allopathic medicine. It involves the use of medications or surgery, often accompanied by counseling and lifestyle changes. Alternative and complementary medicines include acupuncture, homeopathy, herbal medicine, art therapy, traditional Chinese medicine, and many more. Modern medicine has many areas and aspects. Here is some of them:

Clinical practice. A clinician is a healthcare professional who works directly with patients in a hospital or other healthcare facility. Nurses, doctors, psychotherapists and other professionals are all physicians. Not all medical professionals are clinicians.

Researchers and lab technicians are not clinicians because they don't work with patients. A physician evaluates a person for the purpose of diagnosing, treating, and preventing disease, using knowledge gained from training, research, and experience, as well as clinical judgment. Biomedical research - this field of science is concerned with finding ways to prevent and treat diseases that lead to illness or death. Biomedical scientists use biotechnology methods to study biological processes and diseases. They strive to develop successful therapies and treatments. Biomedical research requires careful experimentation, development, and evaluation. It involves biologists, chemists, doctors, pharmacologists and others. Medications - This area deals with medicines or medicines and how they are used. Doctors and other healthcare professionals use medicines for medical diagnosis, treatment, and disease prevention.

Surgery. Surgical procedures are necessary to diagnose and treat certain types of diseases, defects, and injuries. They use not medicines, but instrumental and manual means. The surgeon may perform a surgical procedure to remove or replace diseased tissue or organs, or they may use surgery to remove tissue for a biopsy. Sometimes they remove unwanted tissue and then send it off for diagnosis.

Medical devices. Medical professionals use a wide range of tools to diagnose and treat a disease or other condition, prevent symptoms from getting worse, replace a damaged part like a hip or knee, etc.

Medical equipment ranges from test tubes to sophisticated scanning machines. Alternative and complementary medicine - this includes any healing practice that is not part of traditional medicine. Methods vary. These include using herbs, manipulating the "channels" in the body, relaxing, and so on.

Alternative and Complementary do not have the same meaning: Alternative Medicine: People use alternative therapies, such as using relaxation aids to relieve headaches, rather than painkillers. Complementary Medicine: People add another treatment option to their primary treatment. For example, they may use relaxation as well as painkillers for headaches. Alternative and complementary therapies are often based on traditional knowledge rather than scientific evidence or clinical trials. Examples include homeopathy, acupuncture, Ayurveda, naturopathic medicine, and traditional Chinese medicine. Clinical researches. Researchers are doing research to find out what diseases are present, why they occur, what can treat or prevent them, making them more likely, and many other aspects of health. Clinical trials are one aspect of clinical research.

They seek to find out whether a therapy - often drug therapy - is safe and effective for treating a particular condition. The most effective way to demonstrate the effectiveness of a drug or technique is to conduct a double-blind, randomized, long-term, large clinical trial in humans. In this type of study, researchers compare the effect of a therapy or drug to a placebo, no treatment, or another therapy or drug.

Other areas of medicine include pharmacology and pharmacy, nursing, speech therapy, medical practice management, and more.

Branches of medicine. There are many branches in medicine. Here are some of them: Anatomy is the study of the physical structure of the body. Biochemistry- A biochemist studies the chemical components and their effect on the body. Biomechanics - here the focus is on the structure of biological systems in the body and the principles of their work using a mechanical approach. Biostatistics - Researchers apply statistics to biological fields. This is very important for successful medical research and many areas of medical practice. Biophysics - uses physics, mathematics, chemistry and biology to model and understand the workings of biological systems. Cytology is a branch of pathology that includes the medical and scientific microscopic examination of cells.

Embryology is a branch of biology that studies the formation, early growth, and development of organisms. Endocrinology-Scientists study hormones and their effect on the body. Epidemiology-Researchers track the causes, spread, and control of diseases in a population. Genetics is the study of genes and their effects on health and the body.

Histology- This involves examining the shape of structures under a microscope. This is also known as microscopic anatomy. Microbiology is the study of organisms that are too small to be seen with the naked eye, known as microorganisms. Neurology – Neuroscientists study the nervous system and the brain, and investigate diseases of the nervous system. Aspects of neuroscience include computer modeling and psychophysics. Some types of neuroscience are cognitive neuroscience, cellular neuroscience, and molecular neuroscience. Nutrition-Dietitians study how food and drink affect health and how they can help treat, treat, and prevent various diseases and conditions.

Pathology is the study of disease. A pathologist often works in a laboratory where they perform tests - usually on a sample of blood, urine, or body tissues - to help diagnose diseases and conditions. Pharmacology is the study of drugs, including their origin, history, uses, and properties. The focus is on the effect of drugs on the body. A medicine is a substance that is used to treat, cure, or prevent a disease, or otherwise improve physical or mental health.

Pharmacology emerged as a separate discipline in the 19th century, separating from the research conducted in such scientific fields as organic chemistry and physiology. Oswald Schmideberg, born in what is now Latvia in 1838, is considered the father of pharmacology. His doctoral thesis was on the measurement of chloroform in the blood, and then he became a professor of pharmacology at the University of Strasbourg, where he directed the Institute of Pharmacology. There he studied chloroform, which was used as an anesthetic, chloral hydrate, a sedative and hypnotic, and muscarine, a compound isolated from

the mushroom Amanita muscaria that stimulates the parasympathetic nervous system and is used to treat various diseases such as glaucoma.

In 1890, John Jacob Abel became the first chair of pharmacology in the United States at the University of Michigan. He later enrolled at Johns Hopkins University in Baltimore. [1]

Abel first isolated the hormone adrenaline from the adrenal glands, isolated histamine from the pituitary gland, and produced pure crystalline insulin. Animals such as dogs, cats, pigeons and frogs have been used to test pharmacological substances. People were even used as test subjects. They sometimes suffered severe side effects from these substances, such as when the German pharmacist Friedrich Sertürner and three of his friends were poisoned for several days by an alkaloid that Sertürner isolated from opium. Later, this alkaloid was named morphine in honor of the ancient Greek god of sleep, Morpheus.

Today, the most common test animal is the mouse, which is convenient to use because it is small, easy to breed, and can produce many generations in a relatively short amount of time. Guinea pigs and rabbits are also sometimes used. Once a compound has passed enough trials to be considered reasonably safe, it is used in a phase I clinical trial in human volunteers, and over time it may become a widely available drug.

Branches of pharmacology: Pharmacodynamics is the study of the physiological or biological effects that different concentrations of drugs have on the body over time. This branch involves the study of the localization of the drug in a certain area of the body, for example, in the brain. Most drugs can affect more than one part of the body, and some may cause unwanted side effects. Sometimes it depends on the dose of the drug. The substance may have side effects if taken in excess; for example, too much magnesium in the body can cause diarrhea.

Pharmacokinetics is the study of how the body absorbs, metabolizes, and eliminates drugs. The drug can be administered orally, parenterally (for example, by injection) or intravenously (into the bloodstream, through a drip). The kidneys are the main organ that filters drugs from the body, but the lungs and sweat glands also play a secondary role.

Other areas of pharmacology, which may include both the two main branches of pharmacodynamics and pharmacokinetics, include:

1. Clinical pharmacology: The focus is on the therapeutic use of drugs and factors that may affect the effectiveness of the drug, such as age, pregnancy, disease, and combination when used with other drugs. It is also related to bioavailability, which is the fraction of a drug dose that is actually absorbed by the body, rather than just passing through it.

2. Toxicology: The focus is on the side effects that drugs can have on the body. It examines side effects not only from drugs administered for therapeutic purposes, but also from chemicals to which a person may be exposed in their family, workplace, or environment. Difference between pharmacy and pharmacology. Pharmacology is one of the areas studied by those preparing to become pharmacists. Pharmacists are drug specialists.

They have a variety of roles such as dispensing medications, educating patients on the proper use of medications, advising healthcare professionals on which medications to administer to a patient, and helping to monitor a patient's health status. Pharmacologists conduct drug research in the laboratory to better understand how these substances work and possibly turn them into pharmaceuticals. They study drugs, and pharmacists provide the final product to patients along with information about its use.

Each drug has several names: chemical; international non-proprietary name (INN); trade (commercial). The chemical name reflects the composition and structure of the medicinal substance. It accurately describes the drug, but is usually too complex for widespread use. Example: ethyl 1-methyl-4-phenylisonipectotate hydrochloride.

The international nonproprietary name (full term: international nonproprietary names for pharmaceutical substances, INN) is the name of a medicinal substance recommended by the World Health Organization (WHO), accepted for use worldwide in educational and scientific literature for the convenience of identifying the drug by belonging to a particular pharmacological group. Example: acetaminophen.

A proprietary trade name is assigned by pharmaceutical companies that produce this original drug, and is their commercial property (trademark), which is protected by a patent. Example: the trade name of acetylsalicylic acid is Aspirin, bisoprolol is Concor.

International law applies to international generic drug names. National legislation regulates relations arising in connection with the choice of national non-proprietary names (NNN) and trade names of medicines. The International Nonproprietary Names for Pharmaceutical Substances (INN) is a unique name of a pharmaceutical substance that has worldwide recognition and is public property.

In 1950, the World Health Organization (WHO) adopted a resolution that determined the need for international coordination of the work of national authorized organizations on the examination of names of medicines, the creation of an appropriate WHO advisory board and the development of a program on International Generic Names of Medicines. In 1953, the first list of International Nonproprietary Names (INN) for pharmaceutical products was published. Currently, the total number of recommended INNs reaches approximately 8,000 and continues to grow by 100-120 new names annually.

A list of common bases used in the selection of INNs is provided in the WHO document "Using common bases in the selection of international nonproprietary names (INNs) for pharmaceutical products"[2]

Linguistic model of drug name[3]:

1. Foundation (phrasing). When adding up the foundations according to the “object-action” model, names are created that are the easiest to identify information: Haematogenum - Hematogen, hematopoietic stimulator, Greek. haema, atos - blood, genos - genus, birth; Urografin - Urografin, a radiopaque agent for the diagnosis of diseases of the urinary system, Greek. uron - urine, grapho - write + -in;

2. Suffixation - using suffixes -in-, -ol-, -al-, -id-, etc.; – using prefixes ex- and des- as suffixes”; – using final elements. Suffixation is the addition of a suffix to the stem that has a certain meaning or simply completes the name of medicines. The suffix -in-, originating from the suffix of Latin adjectives with the meaning of relation to an object, phenomenon, is one of the most common in the nomenclature of medicines. The meanings of the producing bases are varied: the source of obtaining medicines, disease, the result of the action of medicines, etc. The suffix -ol- has a twofold origin:

a) from the final part of the word alcohol; used in the names of alcohols, phenols and alcohol-containing drugs: Batilol - Batilol, Batyl alcohol, radioprotector; Iodinolum - Iodinol, an antiseptic containing iodine and polyvinyl alcohol;

b) from the word oleum - oil; used in the names of drugs containing oil or having an oily consistency: Aecolum - Aekol, a combined drug containing vitamins A, E and others, as well as vegetable oil.

The suffix -al-, derived from the initial part of the word alcohol, was first used in the name of a substance with a hypnotic effect, Chloralum hydratum (Chloral hydrate), and was originally used in the names of hypnotics: Veronal - Veronal, a hypnotic, a derivative of barbituric acid; Verona - Verona, a city in Italy + -al.

Some root elements, due to regular use at the end of words, approaching suffixes in function, can be called suffixoids. So, the truncated root -cid-, which comes from lat. occido - to kill, in the 30-40s of the XX century was used to create the names of drugs that destroy microorganisms, i.e. the names were built as compound words formed according to the "object-action" model: Streptocidum - Streptocide, a drug that kills streptococci ; Plasmocidum - Plasmocide, an agent for the destruction of malarial plasmodia. Since the 50s of the XX century, -cid- has been used in the names of antimicrobial and antiparasitic agents, while the first part of the word may not indicate the object of the drug: Chinocidum - Chinocid, an antimalarial drug belonging to the chemical group of quinolines.

In addition, in the trade names of medicines, the final elements are used as suffixes without a special meaning: -ax, -ox, -ix: Vermox - Vermox, antihelminthic, lat. vermis - worm + -ox; Cardix - Cardix, antianginal agent, Greek. cardia - heart + -ix. The third linguistic model of the drug name is prefixation.

Prefixation is a method of word formation, which is rarely found in its pure form in the nomenclature of medicines. More common are the names of drugs formed by the prefix-suffix method, often from an abbreviated stem. Prefixation in the nomenclature of medicines performs the following tasks: emphasizes the information contained in the root of the word; complements the information contained in the root; indicates the high quality of medicines. Thus, the presence of a prefix in the name of medicinal products is, as a rule, a sign of the relation of the name to the commercial nomenclature of medicinal products. The most common prefixes, which, in combination with roots denoting a disease or the cause of a disease, indicate the effect of drugs aimed at eliminating them: anti-, contra- - against; a- – not, negation, de(s)- – from; e-, ex-, exo- - from: Antistruminum - Antistrumine, a remedy for the prevention of endemic goiter; anti- + lat. struma - goiter + -in; Contratubex - Contratubex, a remedy for eliminating keloid scars; contra- + lat. tuber - tubercle, outgrowth + -ex; Abaktal - Abaktal, an antibacterial agent; a- + bacterium + -al. The pro- prefix is used in the meanings: "for", "instead of",

4. Reduction of the word - with the preservation of the initial part of the original word; with the preservation of the final part of the word; with the preservation of the middle part of the word; with the preservation of letters and syllables arbitrarily selected from the word. The abbreviation of the word is a method used very often in the trade nomenclature of medicines: ACC - ACC, from Acetylsalicylic acid; PASK - PASK, from para-aminosalicylic acid.

5. Creation of complex abbreviated words is a method of word formation most often used in the nomenclature of medicines, including in the names of combined drugs, while the ways of reducing the original words are also diverse: Theodibaverinum - Teodibaverin, a combined drug containing theobromine, dibazol, papaverine; Humulin - Humulin, antidiabetic agent, lat. humanus - human, Insulin - insulin. 6. Overlay of parts of words - a method used as an additional method when creating complex or compound words in order to reduce the total length of the word. The most frequent cases of imposition of one letter common to the connected parts of the original words: Vulnusan - Vulnusan, an anti-inflammatory wound healing agent; lat. vulnus - wound + sano - to heal.

Less common are cases of overlapping two or three letters: Progesteronum - Progesterone, a hormonal agent, pro - for, gestatio - pregnancy, gestation, steroidum - steroid + -on; Pectusinum - Pectusin, expectorant, lat. pectus - chest + tussin - cough + -in.

7. Permutation of word components - permutation of adjacent letters or letter combinations, permutation of adjacent syllables; permutation of arbitrarily chosen parts of the name complete permutation of letters, starting from the end of the word or part of it. The rearrangement of word components is a method widely used in the formation of trade names for medicines. A word formed by rearranging the letters of another word is called an anagram: Adebit - Adebit, an antidiabetic agent. The name is obtained by rearranging the letters of the term diabet(es). In its pure form, this method is not common, usually permutation accompanies other methods of word formation.

Iodovidonum - Yodovidone, an antiseptic. Compare: Povidone-Iodine - Povidone-Iodine, the USP name.

8. Initial abbreviation (abbreviation names) - that is, abbreviation of words while retaining only their initial letters, is a method used in the trade nomenclature of medicines in a peculiar way. Since the initial for the names of medicines are almost always compound or complex abbreviated words and phrases, the abbreviation is usually formed from the initial letters of the components of these words: 5-NOK - 5-NOK, an antimicrobial agent from INN Nitroxolin - Nitroxoline. 9. Borrowing of words is a way of creating drug names, which is the use of words taken in finished form from natural languages or from medical terminology to designate drugs: Duplex - Duplex, a general tonic containing two components - strychnine nitrate and potassium arsenate, lat. duplex - double; Gasterin, Venter - Gasterin, Venter, drugs used for gastric and duodenal ulcers, Greek. gaster - stomach, lat. venter - belly; Adonis - Adonis, extract from spring adonis herb - Adonis vemalis; Memoria - Memoria, a drug for the treatment of diseases of the nervous system and memory improvement, lat. memory - memory.

Thus, a significant number of word-formation methods and additional techniques are used to create the names of medicines, both independently and in various combinations. A variety of methods and word-formation means allows you to create sufficiently different names for analogue drugs.

With all the variety of the above methods of word formation used in the creation of trade names for drugs, it is necessary to take into account some general principles when forming them: possible brevity, euphony, absence of negative associations, originality of spelling and sound.

Medicine is a constantly changing science. As new research and clinical experience expand our knowledge, changes in treatment and drug therapy are needed. To date, drug therapy is one of the most dynamically developing branches of medicine. The scientific foundations of clinical pharmacology were laid in the 1930s. of the last century, when fundamental discoveries in the field of drug therapy took place and sulfonamides, H1 receptor blockers, the first antihypertensive drugs and other drugs began to be used. Summing up the above, I would like to once again emphasize the important role of clinical pharmacology

in modern medicine, aimed, on the one hand, at the strict implementation of treatment standards, and on the other hand, at the rejection of templates in certain situations and the individualization of pharmacotherapy. Using the possibilities of clinical pharmacology is a modern approach to choosing a drug for a particular patient, and this, in turn, requires deep knowledge and high professionalism.

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