

ODESSA NATIONAL MEDICAL UNIVERSITY
DEPARTMENT OF PHARMACOLOGY AND PHARMAKOGNOSY

WORKBOOK

FOR LESSONS BY DISCIPLINE
PHARMACEUTICAL ASPECTS OF TOBACCO SMOKING, ALCOHOLISM,
DRUG ADDICTION AND SUBSTANCE ABUSE

STUDENT _____
(name, surname)

PHARMACEUTICAL DEPARTMENT

COURSE _____ **GROUP** _____

SPECIALITY PHARMACY

20 _____ / **20** _____

Workbook for students of daytime form of study by discipline:
«Pharmaceutical aspects of tobacco smoking, alcoholism, drug addiction and
substance abuse» / Methodical working of the Department of Pharmacology and
Pharmacognosy of Odessa National Medical University - Odessa: ONMedU, 2020 -
89 p.

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Reviewed at the meeting of the department 22.09.2020 Protocol № 2

Reviewed at the meeting of the subject-cycle methodological commission on
pharmacy __. __. 2020 Protocol № 2

Approved and recommended for publication by the Central Coordination and
Methodological Council of Odessa National Medical University "___" _____ 2020

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Explanatory note

A workbook on the discipline: "Pharmaceutical aspects of tobacco smoking, alcoholism, drug addiction and substance abuse" for students of daytime form of study of the Faculty of Pharmacy was discussed at a meeting of the department.

The workbook is a textbook where the issues of studying the epidemiology and general principles of prevention of modern diseases of civilization - drug addiction, substance abuse and alcoholism - are considered, which pose a real threat to the safety of an individual and society as a whole.

The purpose of the discipline is to study the epidemiology and general principles of the prevention of drug addiction, substance abuse and alcoholism.

The task of the discipline is to acquire theoretical skills in using the knowledge learned in practice.

As a result of studying the academic discipline, the student should **know**:

- the definition of narcological toxicology as a section of clinical toxicology: tasks, diagnostic methods; phases of poisoning;
- the organization of drug and substance abuse treatment in Ukraine;
- the epidemiology and general principles of prevention of drug addiction, substance abuse and alcoholism;
- the definition of the concepts of "drug addiction", "substance abuse", "narcotic", "psychotropic substance", "precursors";
- physicochemical and chemical properties of inorganic and organic substances,
- biochemical transformations occurring in the body,
- the structure of organs, body systems and their disorders;
- possible ways of penetration of surfactants into the body, their toxicokinetics and toxicodynamics, the main regularities of the behavior of exogenous chemicals in the human body and the corpse, the influence of these processes on the results of chemical and toxicological analysis.

The student also should **be able to**:

- to carry out a primary diagnostics of drug intoxication by external symptoms and organize first aid for acute poisoning;
- to carry out the correct choice of objects of chemical and toxicological analysis in case of intoxication by various groups of narcotic and psychotropic substances, taking into account the basic laws of their behavior in the body (routes of entry, distribution, cumulation, metabolism and excretion);
- to plan the foundations of a healthy lifestyle and an understanding of irreversible dysfunctions of the body as a result of the abuse of narcotic and psychotropic substances.

LESSON №1

TOPIC: Terminology in narcology. Classification of narcotic and psychoactive substances. General principles of diagnosis, treatment and prevention of drug addiction and substance abuse.

PURPOSE: To become familiar with the basic terminology in narcology. Study the classification of narcotic and psychotropic substances, as well as establish the stages of drug addiction. To reveal the essence of the stages and methods of drug addiction and substance abuse treatment.

PLAN:

1. Terminology in narcology.
2. Classification of narcotic and psychoactive substances.
3. Stages of drug addiction. Stages and methods of drug addiction and substance abuse treatment.

INFORMATIONAL MATERIAL

Narcology is a medical science that studies the causes of occurrence, mechanisms of formation, clinical manifestations of dependence on psychoactive substances (PAS), toxic effects caused by them, in order to develop methods for the diagnosis, treatment and prevention of these addictions.

Drugs (from the greek Narkotikós - leads to numbness, intoxicating) - a group of substances of various natures that have a stimulating, depressing or hallucinogenic effect on the central nervous system, the abuse of which leads to the development of drug addiction.

Nowadays, the term "**narcotic drug**" (narcotic) has a strict definition, which is advisable to use in considering issues related to drug addiction and substance abuse, and in the case of the legal aspect of this problem, it is necessary, because the circulation of narcotic and psychotropic substances is under the control of the current legislation of the country, for the violation of which there is criminal responsibility.

Narcotic drug (narcotic) – is a substance that meets three criteria - medical, social and legal:

- the substance or drug must have a specific (stimulating, sedative, hallucinogenic, etc.) effect on the central nervous system, which is the reason for its non-medical use (medical criterion);
- substance use is significant, and the consequences of this acquire have a large social weight (social criterion);
- the substance is recognized as narcotic in the manner prescribed by law and is included in the list of narcotic drugs (legal criterion).

Until 1971, the term "**psychotropic substance**" was interpreted only in terms of medical and pharmacological positions and was defined as a drug acting on the course of mental processes in the central nervous system of a person. Since 1971, a new UN Convention on Psychotropic Substances has been adopted, according to which psychotropic substances are those that are included in the relevant lists of the Convention. Thus, this term has already acquired a legal connotation. The Convention determined that only those substances that cause pathological addiction, have a stimulating or depressing effect on the central nervous system, which cause hallucinations or disorders of motor function, or thinking, or behavior, or perception, or mood, can be included in the list of psychotropic substances, so, that such an action could be a threat to public health, that is, a social problem.

Substance abuse is a group of diseases that is characterized by a persistent desire to regularly use psychoactive substances in order to enjoy or maintain a state of mental and physical comfort. The commonality of all substance abuse is determined by the presence in their clinical picture of three "large drug addiction syndromes": mental dependence, physical dependence and altered body reactivity to the substance used.

Addictions are traditionally called substance abuse for substances that are classified as narcotic. The delimitation of these concepts is purely conditional and is due to the legal regulation of the production, storage, distribution and use of drugs and, accordingly, the administrative or criminal liability of a person for violating the requirements regulated by law.

The names of certain forms of drug addiction and substance abuse retain their meaning: alcoholism, nicotinism, hashishism, cocainism, morphinism, heroinism, etc.

Clinical characteristics of various types of substance abuse and drug addiction are characterized by the presence of a major drug addiction syndrome.

Major addiction syndrome is a leading syndrome that accompanies such diseases as substance abuse, drug addiction and alcoholism; it includes the syndrome of altered dependence on psychoactive (narcotic) substances and the syndrome of altered reactivity of the body.

Major addiction syndrome is a leading syndrome that accompanies such diseases as substance abuse, drug addiction and alcoholism; it includes the syndrome of altered dependence on psychoactive (narcotic) substances and the syndrome of altered reactivity of the body.

Altered addiction syndrome includes mental dependence, physical dependence and withdrawal symptoms.

Psychical dependence is a state of mental comfort in case of toxicomaniac (narcotic) intoxication and a painful craving for the use of a psychoactive substance in order to again feel the desired effect or suppress the phenomena of mental discomfort.

Physical dependence is a state of physical comfort in case of substance abuse (narcotic) intoxication and the phenomenon of abstinence (withdrawal symptoms, withdrawal symptoms) with a sudden discontinuation of substance use. Regular use of narcotic and psychotropic substances leads to a restructuring of the body's regulatory systems, implemented at all biological levels, and the substance itself is

included in natural metabolic cycles. As a result, a new homeostasis is formed, in which narcotic (psychotropic) substances are assigned the role of a regulator. A sudden cessation of the use of this substance is accompanied by a homeostatic disorder, which determines the pathogenetic essence of abstinence as a systemic reaction of the body.

Withdrawal (withdrawal symptoms) is a painful condition that develops in patients with drug addiction or substance abuse after discontinuation of the use of substances that cause addiction, and is a sign of physical dependence.

Task 1

Classification of narcotic and psychoactive substances:

- _____

- _____

- _____

- _____
- _____

A) Narcotic and psychoactive substances of plant origin:

Cannabinoids – _____

	Botanical description of the plant

Opiates (morphine, codeine) – _____

	Botanical description of the plant

Cocaine – _____

	Botanical description of the plant

Nicotine – _____

	Botanical description of the plant

Caffeine – _____

	Botanical description of the plant

B) Semi-synthetic narcotic and psychoactive substances:

Heroin – _____

Dionine (Ethylmorphine)– _____

Derivatives of lysergic acid – _____

C) Synthetic narcotic and psychoactive substances:

Fentanyl – _____

Promedol – _____

Tramadol – _____

Amphetamine – _____

Methamphetamine – _____

Ketamine – _____

In accordance with the specifics of the action, narcotic and psychoactive substances are divided into the following main groups:

Hypnotics (depressants) – _____

(names of substances)

Stimulants – _____

(names of substances)

Psychotomimetics – _____

(names of substances)

According to the "List of narcotic drugs, psychotropic substances and precursors" approved by the Cabinet of Ministers of Ukraine dated May 6, 2000 (No. 770), these groups of substances, taking into account the expediency of their use in medical practice, depending on the degree of their danger to human health and applied control measures behind their turnover is included according to numbered lists:

1. Extra dangerous narcotic drugs, the turnover of which is prohibited:

(list of group representatives)

2. Extra dangerous psychotropic substances, the turnover of which is prohibited:

(list of group representatives)

3. Plants containing narcotic drugs and psychotropic substances and the turnover of which is allowed for industrial purposes:

(list of group representatives)

4. Narcotic drugs with limited turnover:

(list of group representatives)

5. Psychotropic substances, the turnover of which is limited:

(list of group representatives)

6. Psychotropic substances, the turnover of which is limited and exceptions to certain control measures are permitted:

(list of group representatives)

7. Precursors, the turnover of which is limited and for which control measures are established:

(list of group representatives)

8. Precursors for which control measures are established:

(list of group representatives)

Task 2

Stages of addiction. Stages and methods of drug addiction and substance abuse treatment.

Addiction is a disease that develops in stages. The severity of mental and physical disorders associated with the use of psychoactive substances is reflected in the dynamics of major drug addiction syndromes.

The stage of abuse of a narcotic or psychoactive substance without the development of dependence is distinguished, characterized by the alternation of the state of narcotic (toximanic) intoxication, with states of sobriety, the absence of clinical symptoms of drug addiction, the formation of a rhythm of drug addiction (alcoholization), and the leveling of the initial effect of the drug.

At the initial period of the disease, an increase of tolerance to psychoactive substance is observed, possibly repeated use of a narcotic substance during a day, sleep disturbance, a constant increase in vitality.

Stages of the disease

I stage – _____

II stage – _____

III stage – _____

Stages of drug addiction and substance abuse treatment:

I stage – _____

II stage – _____

III stage – _____

QUESTIONS FOR SELF-CONTROL:

1. Formulate the main tasks that narcology solves.
2. Give a definition of terms "drug", "psychotropic substance", "psychoactive substance".
3. What are the medical, social and legal aspects of the problem of drug addiction terminology?
4. Give a definition of terms "addiction", "substance abuse". What is the reason for the transformation of the diagnosis of "substance abuse" into the diagnosis of "drug addiction" and vice versa?
5. Large addiction syndrome and its constituent parts.
6. Types of classification of narcotic and psychoactive substances.
7. Classification of narcotic and psychoactive substances by origin.
8. Give examples of surfactants of plant origin.
9. Give examples of semi-synthetic and synthetic surfactants.
10. Classification of surfactants according to the specificity of their action on the body. Give examples.
11. What are the stages of drug addiction?
12. Name the stages of drug addiction and substance abuse treatment.
13. Name the methods of treatment for drug addiction and substance abuse.
14. What is substitution maintenance therapy?
15. Forms of psychotherapy in the treatment of drug addiction and substance abuse.

TESTS:

1. A drug is a substance that meets:

- A. Two criteria - medical and social
- B. Two criteria - physical and legal
- C. Three criteria - medical, social and legal
- D. Three criteria - pharmacological, social and physical

2. Substance abuse is a disease in which, in order to enjoy or maintain a state of mental and physical comfort, a person regularly uses:

- A. Medicines
- B. Narcotic substances
- C. Psychoactive substances
- D. Psychotropic substances

3. Drug addiction - substance abuse of psychotropic substances, which are included in the list of narcotic substances according to:

- A. Relevant legislation
- B. For medical purposes
- C. Pharmacological action
- D. Physical and chemical properties

4. *According to the medical criterion, drugs include a substance that has a specific (stimulating, sedative, hallucinogenic, etc.) effect on the central nervous system, which is the reason for it:*

- A. Medical use
- B. Non-medical use
- C. Prohibition of use in medicine
- D. Restrictions on turnover

5. *According to the social criterion, drug is a substance that:*

- A. Possesses high toxicity, which leads to a large number of poisonings
- B. Makes a specific effect on the body, which is the reason for its abuse
- C. Prohibited by law for use in medicine
- D. Has a wide non-medical use in society and the consequences of this acquire great social weight

6. *Withdrawal is a painful condition that develops in patients with drug addiction or substance abuse after discontinuation of use of substances, and is a sign of:*

- A. Physical dependence
- B. Mental addiction
- C. Drug tolerance
- D. change in the form of intoxication under the influence of a psychoactive substance

7. *Tolerance to psychoactive and narcotic drugs is a characteristic of:*

- A. Physical dependence
- B. Mental addiction
- C. Syndrome of altered reactivity of the body to a narcotic substance
- D. Withdrawal symptoms

8. *Narcotic and psychoactive substances of plant origin include:*

- A. LSD
- B. Cannabinoids
- C. Heroin
- D. Ephedron

9. *Semi-synthetic narcotic and psychoactive substances include:*

- A. Morphin
- B. Ergin
- C. Mescaline
- D. Heroin

10. *Semi-synthetic narcotic and psychoactive substances include:*

- A. LSD
- B. Dimethyltryptamine
- C. Mescaline
- D. Ergin (LSA)

11. *Synthetic narcotic and psychoactive substances include:*

- A. MDMA
- B. DMT
- C. Mescaline
- D. Ergin (LSA)

12. *Synthetic narcotic and psychoactive substances include:*

- A. Buprenorphine
- B. DMT
- C. Salvinorin
- D. Ergin (LSA)

13. *According to the "List of narcotic drugs, psychotropic substances and precursors" approved by the Cabinet of Ministers of Ukraine dated May 6, 2000 (No. 770), heroin is included in:*

- A. Extra dangerous psychotropic substances, the circulation of which is prohibited
- B. Particularly dangerous narcotic drugs, the circulation of which is prohibited
- C. Psychotropic substances with limited circulation
- D. Narcotic drugs with limited circulation

14. *According to the "List of narcotic drugs, psychotropic substances and precursors" approved by the Cabinet of Ministers of Ukraine dated May 6, 2000 (No. 770), morphine is included in:*

- A. Extra dangerous psychotropic substances, the circulation of which is prohibited
- B. Particularly dangerous narcotic drugs, the circulation of which is prohibited
- C. Psychotropic substances with limited circulation
- D. Narcotic drugs with limited circulation

15. *According to the "List of narcotic drugs, psychotropic substances and precursors" approved by the Cabinet of Ministers of Ukraine dated May 6, 2000 (No. 770), cannabis is included in:*

- A. Extra dangerous psychotropic substances, the circulation of which is prohibited
- B. Particularly dangerous narcotic drugs, the circulation of which is prohibited
- C. Psychotropic substances with limited circulation
- D. Narcotic drugs with limited circulation

Answers to tests:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

Checked by:

(teacher's signature)

LESSON № 2

TOPIC: Pharmaceutical aspects and the basics of tobacco smoking prevention.

PURPOSE: To get acquainted with the general characteristics of nicotine addiction and the history of the spread of tobacco smoking. To reveal the essence of the toxic effect and symptoms of poisoning. Understand the basic requirements of first aid and detoxification methods. Learn about methods of preventing tobacco smoking.

PLAN:

1. General characteristics of nicotine addiction.
2. History of the spread of tobacco smoking.
3. The use of tobacco.
4. Toxic effect, symptoms of poisoning.
5. First aid, detoxification methods.
6. Methods for the prevention of smoking.

INFORMATIONAL MATERIAL

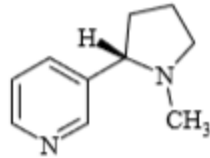
Smoking is an acquired bad habit of inhaling the smoke of smoldering dried tobacco leaves. Nicotine is the most important component of tobacco smoke. Regular use of nicotine causes tobacco dependence. Long-term and frequent smoking of tobacco causes significant damage to the health of smokers and the non-smokers around them.

Smoking is the most widespread type of household substance abuse, a common bad habit all over the world. Tobacco dependence is included in the International Classification of Diseases. Nicotine is a stimulant of the nervous system, has a pathological effect on the body, especially in the development of cancer. Smoking is carried out by inhalation of various smoldering plant products.

Tobacco smoke contains carcinogenic substances. It contains mercury, lead, aluminum, copper and even arsenic, ammonia, acetone, DDT (a highly toxic pesticide), formaldehyde, methanol, naphthalene (used as moth poison), etc. Smoking is the reason of 30% of all deaths from cancer. It can cause the development of cancer of the respiratory system, including the oral cavity and upper respiratory tract, esophagus, and pancreas. A dose of 60 mg of nicotine is lethal; one cigarette contains an average of 0.5 mg.

Cultivated tobacco (*Nicotiana tabacum*) is an annual plant from the Solanaceae (nightshade) family, the dried leaves of which, after special processing, are crushed and used for smoking. The composition of tobacco leaves contains substances such as nicotine, proteins, carbohydrates, organic acids, resins and essential oils. The main feature of tobacco, thanks to which it differs from other plants of the Solanaceae family, is its nicotine content.

Nicotine is an alkaloid found in plant raw materials of the Solanaceae family. Biosynthesis of nicotine occurs in the roots of plants, and it accumulates in the leaves. Its main function is to protect the plant from being eaten, especially by insects. Previously, nicotine was widely used as an insecticide, and in the modern era, its analogues, such as imidacloprid, are used in the future. The nicotine content in dry herb of tobacco ranges from 0.6 to 5%. Nicotine is found both in the leaves, stems and seeds of tobacco. In terms of chemical structure, nicotine is a pyridine derivative.



Nicotine is one of the strongest herbal poisons, the main constituent of tobacco smoke. In its pure form, it is a colorless oily liquid with an unpleasant odor and bitter taste. Nicotine dissolves well in water, alcohol, ether. The specified alkaloid easily penetrates through the mucous membranes of the mouth, nose, bronchi, stomach.

The filter of a cigarette contains enough nicotine to fatally poison a rat. In fact, nicotine is as toxic as hydrocyanic acid.

Task 1

Nicotine addiction and tobacco use

Nicotine addiction (tobacco addiction) is a behavioral complex that is formed under the influence of both external and genetic factors. Nicotine is the main component of cigarettes that causes addiction, although psychological factors and habits play a role.

Tobacco dependence can be regarded as a chronic relapsing disease.

Nicotine addiction has three stages:

First stage – _____

_____;

Second stage – _____

_____;

Third stage – _____

_____;

Tobacco use:

Tobacco as an ornamental plant

Tobacco in agriculture

Tobacco in industry

Tobacco in traditional medicine

Smokeless tobacco use

Smokeless tobacco - _____

Chewing tobacco - _____

Nasvay - _____

Snuff - _____

Snus - _____

Task 2

Toxic effect, symptoms of poisoning

The lethal dose of nicotine for humans is 50-70 mg (1 mg per 1 kg of body weight). It is known that the amount of nicotine entering the body from tobacco smoke is approximately 1/25 of its content in tobacco. A person will receive a lethal dose of nicotine if they smoke 20-25 cigarettes at a time.

The harmful effects of tobacco are not limited to nicotine. Tobacco smoke contains a number of toxic substances: ammonia, hydrocyanic acid, carbon monoxide, etc.

I. The effects of tobacco smoking on the human organism:

1) _____

2) _____

3) _____

4) _____

5) _____

6) _____

7) _____

8) _____

II. First aid for nicotine poisoning, detoxification methods

The first signs of acute nicotine poisoning are:

1) _____

6) _____

2) _____

7) _____

3) _____

8) _____

4) _____

9) _____

5) _____

10) _____

The symptoms of chronic nicotine poisoning are:

1. _____
2. _____
3. _____
4. _____
5. _____

Anyone nearby can provide first aid for nicotine poisoning. This requires:

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

Pharmacological treatment of nicotine addiction

1) Tablets

Anti-smoking pills containing cytisine (Tabex)

Cytisine - _____

Tablets containing varenicline (Champix)

Champix - _____

Combined lozenges (Brizantin)

Brizantin - _____

Nicotine Chewable Tablets (Nicorette)

Nicorette - _____

2) Nicotine patch

3) Anti-smoking sprays

Nicoin - _____

Nicorette - _____

III. Methods for the prevention of smoking

Smoking control in the community should be multifaceted and include:

1. _____

2. _____

3. _____

4. _____

For the complete prevention of tobacco smoking, it must be carried out in two directions:

1) Primary prevention of tobacco smoking

2) Secondary prevention of tobacco smoking

QUESTIONS FOR SELF-CONTROL:

1. Give a definition of the term "smoking".
2. Give a definition of the term "nicotine addiction". Stages of nicotine addiction.
3. What are the toxicological characteristics of nicotine?
4. The use of tobacco.
5. Name toxic effects of smoking on the human body.

TESTS

1. *The main component of tobacco smoke:*

- A. Nicotin
- B. Anabazin
- C. Koniin
- D. Hydrocyanic acid

2. *What group of substances does nicotine belong to?*

- A. Alkaloids
- B. Aminoglycosides
- C. Lipids
- D. Sesquiterpenes glycosides

3. *Tobacco is an annual plant of the family:*

- A. Solanaceae
- B. Rosaceae
- C. Malvaceae
- D. Asteraceae

4. *What stage of nicotine addiction is characterized by episodic smoking of no more than 5 cigarettes a day and does not cause changes in the activity of the nervous system?*

- A. First stage
- B. Second stage
- C. Third stage
- D. Fourth stage

5. *Tobacco is not used:*

- A. In the textile industry
- B. As an insecticide
- C. As a remedy for the treatment of head lice
- D. For the production of paints and varnishes

6. *The measures for the prevention of tobacco smoking do not include:*

- A. Legislative protection of smokers' rights
- B. Banning the advertising of any tobacco product
- C. Prohibiting the sale of tobacco products to minors
- D. Comprehensive information on the dangers of tobacco products

7. *Tobacco smoke does not contain*

- A. Cyanocobalamin
- B. Hydrocyanic acid
- C. Cadmium
- D. Arsen

8. *According to its chemical structure, nicotine is derived from:*

- A. Isoquinoline
- B. Pyridine
- C. Tropane
- D. Quinoline

9. *From what plant materials nicotine is isolated?*

- A. Tobacco ordinary
- B. Opium poppy
- C. White mistletoe
- D. Plantago lanceolata

10. What toxic substances can be found in tobacco smoke?

- A. Cyanides, arsenic, carbon monoxide
- B. Chlorophos, metaphos
- C. Morphine, codeine
- D. Benzene, aniline

11. The stages of nicotine syndrome develop individually and depend on many reasons:

- A. Age
- B. Gender
- C. Physical condition
- D. All of the above

12. The first burned out cigarette can cause discomfort:

- A. Cough
- B. Headache
- C. Dizziness
- D. All of the above

13. What plant matter is used to extract tobacco?

- A. Stem
- B. Grass
- C. Leaves
- D. All of the above

14. What is used as an insecticide in agriculture,:

- A. Nicotin
- B. Khinin
- C. Ephedrine
- D. Atropine

15. Name the type of smokeless tobacco that causes nicotine addiction:

- A. Snuff
- B. Hashish
- C. Crack
- D. Anasha

Answers to tests:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

Checked by:

(teacher's signature)

LESSON №3

TOPIC: Pharmaceutical aspects and the basics of alcoholism prevention.

PURPOSE: To get acquainted with the general characteristics of alcohol dependence and the history of the spread of alcoholism. To reveal the essence of the toxic effect, etiopathogenesis and clinic of alcoholism. Learn the basic requirements of first aid and prevention methods.

PLAN:

1. Alcoholism: concepts and definitions.
2. Alcohol: chemical and toxicological characteristics.
3. Etiopathogenesis and clinic of alcoholism.
4. The clinical picture of alcohol poisoning.
5. First aid for alcohol poisoning and methods of prevention of alcoholism.

INFORMATIONAL MATERIAL

Alcoholism: concepts and definitions

What is **alcoholism**? Discussions on this issue have been going on for more than one century and there are many reasons for this.

First, there is no sufficiently clear border between the concepts of "drunkenness" and "alcoholism". Probably, such a feature does not exist at all, in everyday life these two terms are used as synonyms to denote the phenomenon of excessive consumption of alcoholic beverages.

Secondly, you need to decide whether alcoholism is a disease or a social phenomenon? If you ask the audience a question whether heroin use is a disease, then at least 99% will answer positively, and in the case of alcoholism the answer will not be so unambiguous.

According to the definitions of the World Health Organization (WHO):

- "alcoholism is a chronic persistent or intermittent use of alcohol, which is characterized by impaired control over drinking, frequent episodes of intoxication and an obsession with alcohol and alcohol consumption, despite the negative consequences";

- "alcoholics are people who drink excessively, whose dependence on alcohol has reached such a degree that they reveal physical and mental health problems (medical criterion) or conflicts in the sphere of relations with others, as well as in the field of their social and economic functions (social criterion) or they show harbingers of such development and therefore need treatment "(1967).

- "alcoholism is any form of alcohol consumption that exceeds the traditional, socially accepted "food" norm or goes beyond the social customs of a given society."

Very often in the literature there is the term "chronic alcoholism", however, according to the statement of the Committee on the problem of alcoholism at the UN (1955). "The term alcoholism includes only a condition that is considered chronic." Thus, it is inappropriate to talk about "chronic alcoholism". Drunkenness, which has not yet led to the formation of addiction, it is advisable to designate as "alcoholization".

Another definition: "alcoholism is a progressive disease, determined by a pathological craving for alcohol, mental and physical dependence, the development of a dysfunctional state when alcohol is stopped, and in severe forms and resistant to somatovegetative disorders and mental degradation (Ivanec N.N., 1985). Unlike the WHO definition, N. N. Ivanets emphasizes and emphasizes in the definition that the disease tends to progress.

Despite the fact that all the above definitions characterize alcoholism as a disease, it is not included as a diagnostic object of the International Classification of Diseases (ICD-10), in which there is only "addiction syndrome".

Task 1

Alcohol: chemical and toxicological characteristics

In chemical terms, alcohols are a large group of organic compounds derived from hydrocarbons containing one or more hydroxyl (—OH) groups. Ethanol (ethyl alcohol) is one of the representatives of this class of compounds and the main psychoactive ingredient in alcoholic beverages.

In addition, there is such a concept as "alcohol surrogates", which means alcohol-containing liquids that are not intended for internal use, but they may contain components that are not at all natural for the fermentation process (for example, isopropanol, ethylene glycol). The use of such liquids by "alcoholics" is quite common.

Thus, in order to characterize the toxicological properties of substances leading to the development of alcohol dependence, it is not enough to dwell on ethanol alone, despite the fact that it is the main component of alcoholic beverages. It is necessary to consider the representatives of "Alcohol" from the side of their toxic effect, classifying them in two directions - from a chemical point of view and from the consumer nomenclature of alcoholic beverages, since, of course, their effect on the human body is complex, due to the synergism and antagonism of the "bouquet" of substances, as well as, last but not least, the traditions and the way they are used.

I. Physicochemical properties and toxicity indicators of the main representatives of alcohols (fill in the table)

Physical and chemical properties and toxicity indicators of basic alcohols contained in the composition of alcoholic beverages and alcohol surrogates

Compound, its structural formula	Physico-chemical properties	LD ₅₀ (rats, intragastrically)
<p>Ethanol (rectified high purity)</p> $\text{H}_3\text{C}-\text{CH}_2-\text{OH}$		
<p>Methanol (Wood alcohol)</p> CH_3-OH		
<p><i>n</i>-Propanol</p> $\text{H}_3\text{C}-(\text{CH}_2)_2-\text{OH}$		
<p><i>i</i>-Propanol</p> $\begin{array}{c} \text{H}_3\text{C} \\ \diagdown \\ \text{CH}-\text{OH} \\ \diagup \\ \text{H}_3\text{C} \end{array}$		

<p><i>n</i>-Butanol</p> $\text{H}_3\text{C}-(\text{CH}_2)_3-\text{OH}$		
<p><i>i</i>-Butanol</p> $\begin{array}{c} \text{H}_3\text{C} \\ \diagdown \\ \text{CH}-\text{CH}_2-\text{OH} \\ \diagup \\ \text{H}_3\text{C} \end{array}$		
<p><i>n</i>-Pentanol</p> $\begin{array}{c} \text{H}_3\text{C} \\ \diagdown \\ \text{CH}-\text{CH}_2-\text{CH}_2-\text{OH} \\ \diagup \\ \text{H}_3\text{C} \end{array}$		
<p>3-Methylbutanol-1</p> $\begin{array}{c} \text{H}_3\text{C} \\ \diagdown \\ \text{CH}-\text{CH}_2-\text{CH}_2-\text{OH} \\ \diagup \\ \text{H}_3\text{C} \end{array}$		
<p><i>n</i>-Hexanol</p> $\text{H}_3\text{C}-(\text{CH}_2)_5-\text{OH}$		
<p>Ethylene glycol</p> $\begin{array}{c} \text{CH}_2-\text{OH} \\ \\ \text{CH}_2-\text{OH} \end{array}$		

II. Ethanol

Ethanol

Ethanol toxicokinetics:

Ethanol toxicodynamics:

a) *Phase of nonspecific action* _____

b) *Phase of specific action* _____

The effect of ethanol on the central nervous system:

The effect of ethanol on the mucous membranes of the oral cavity:

The effect of ethanol on the gastrointestinal tract:

The effect of ethanol on the liver:

The effect of ethanol on the fetus:

The effect of ethanol on the cardiovascular system:

The effect of ethanol on the respiratory system:

Gin _____

Brandy _____

Cognac _____

Grape wines _____

Beer _____

Task 2

1. The clinical picture of alcohol poisoning:

1. Acute ethanol poisoning _____

2. Methyl alcohol poisoning _____

3. Ethylene glycol poisoning _____

II. First aid for alcohol poisoning and methods of preventing alcoholism:

1. First aid for acute ethanol poisoning:

2. First aid for acute methanol poisoning:

3. First aid for acute poisoning with ethylene glycol:

QUESTIONS FOR SELF-CONTROL:

1. What is alcoholism?
2. What is meant by the concept of "alcohol"?
3. Physicochemical properties and application of ethanol.
4. Toxicokinetics of ethanol.
5. Toxicodynamics of ethanol.
6. Physicochemical properties and application of methanol.
7. The toxic effect of methanol on the body.
8. Fusel oil. The composition of fusel oils and their toxic effect on the human body.
9. Physicochemical properties and application of ethylene glycol.
10. What causes toxicity in case of ethylene glycol poisoning?
11. What is meant by the term "alcohol surrogates"? The main clinical symptoms of poisoning with them.
12. Clinical picture of ethanol poisoning. First aid for poisoning.
13. Acute methanol poisoning. First aid for poisoning.
14. Acute ethylene glycol poisoning. First aid for poisoning.
15. Prevention of alcoholism.

TESTS

1. *In the process of metabolism of certain substances in the body, a toxic substance is formed - formaldehyde. It can be formed from:*

- A. Ethanol
- B. Resorcin
- C. Methanol
- D. Acetone

2. *In case of methanol poisoning, blindness occurs. This is due to the metabolism of this substance in the body with the formation of a toxic metabolite:*

- A. Methanol conjugate
- B. Formaldehyde
- C. Formic acid
- D. Chloroform

3. *Substances in the body under the action of enzymes undergo various transformations. What direction of metabolism is typical for ethyl alcohol:*

- A. Oxidation
- B. Hydroxylation
- C. Dealkylation
- D. Conjugation

4. *In case of poisoning, antifreezes made on the basis of ethylene glycol use a biochemical antidote:*

- A. Nalorfin
- B. Ethanol
- C. Atropin
- D. Amyl nitrite

5. *As an antidote for methanol poisoning use:*

- A. Methylene blue
- B. Sodium bicarbonate
- C. Ethanol
- D. Unithiol

6. *What substances cause the development of metabolic syndrome in case of ethylene glycol poisoning:*

- A. Glycolic aldehyde
- B. Glycolate
- C. Glyoxylate
- D. All of these

7. *The maximum concentration of alcohol in the blood is observed in:*

- A. 1.5-2 h
- B. 30 min
- C. 4 h
- D. 15 h

8. *The main metabolite of ethanol is:*

- A. Formaldehyde
- B. Methanol
- C. Acetaldehyde
- D. p-aminobenzoic acid

9. *The composition of fusel oil, obtained during the rectification of alcoholic alcohols, includes:*

- A. Isopropanol
- B. All specified substances
- C. n-Pentanol
- D. i-Butanol

10. *What kind of alcohol is called "wooden"?*

- A. Methilovy
- B. Ethyl
- C. Isopropyl
- D. Butylovy

11. *Methods of natural detoxification for acute methanol poisoning include:*

- A. Gastric lavage
- B. Forced diuresis with alkalization of plasma
- C. Peritoneal dialysis
- D. All of the above

12. *Ethanol is used in medicine as:*

- A. Antidepressant
- B. Antiseptic
- C. Sleeping pills
- D. Sedative

13. *What substance belongs to the group of antidepressants that suppress the central nervous system?*

- A. Ethanol
- B. Hydrocyanic acid
- C. Phenol
- D. Formaldehyde

14. The concentration of ethanol in the blood is expressed in:

- A. mole
- B. percent
- C. ppm
- D. gram

15. Alcohol intoxication of a moderate degree, depending on the concentration of ethanol in the blood, will be at:

- A. 0.4-0.5 ‰
- B. 1.5-2.49 ‰
- C. 0.9-1.49 ‰
- D. 3.5-5.0 ‰

Answers to tests:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

Checked by:

_____ (teacher's signature)

LESSON № 4

TOPIC: Pharmaceutical aspects and the basics of prevention of opiates use and dependence on them.

PURPOSE: To review the general characteristics of opiates and the history of opiate use. To reveal the essence of medical use, toxic effects and metabolism of opiates. To master the basic requirements of first aid and methods of prevention of opiate poisoning.

PLAN:

1. General characteristics, plant sources of opiates.
2. History of opiate use.
3. Medical use of opiates.
4. Toxic effect, opiate metabolism.
5. First aid for opiate poisoning.
6. Antidote therapy.
7. Prevention of opiate poisoning.
8. Characteristics of individual representatives of the opiate group.

INFORMATIONAL MATERIAL

Opiates are a group of sedative drugs that are isolated from the opium poppy, as well as their derivatives, which are obtained during further chemical processing of morphine. Opiates are used in medicine to relieve severe pain, suppress cough and diarrhea, are narcotic analgesics. Most are prescribed by prescription, but less potent drugs can be bought over the counter in combination with other ingredients.

Opioids are compounds that are not similar in chemical structure to opiates, but are narcotic analgesics in terms of clinical action, therefore they selectively interact with opioid receptors. These include synthetic substances of various groups (fentanyl and its derivatives, promedol, tramadol, methadone, buprenorphine, naloxone, naltrexone, etc.)

Herbal sources of opiates:

- Opium poppy - *Papaver Somniferum* (papa - baby porridge; somniferum - sleeping pills, from *somnus* - sleep and *ferre* - carry)
- Poppy of Troy - *Papaver setigerum*;
- Iranian (Persian) poppy - *Papaver bracteatum*;
- Oriental poppy - *Papaver orientale*.

Opium poppy narcotics:

- Milk juice from various types of poppy, is not opium, but contains poppy alkaloids, included in the lists of narcotic drugs and psychotropic substances;
- Opium (including medical)
- Poppy straws;

- Extract of poppy straw;
- Morphine, codeine, thebaine, normorphine, norcodeine, etc .;
- Acetylated opium;
- Diacetylmorphine (heroin), 6-monoacetyl- and 3-monoacetylmorphine, acetylcodeine.

Opiate history:

- The pharmacological effects of opium were known to the ancient Sumerians, 6000 BC, who called the poppy "the plant of joy".
- Opium was used by the ancient Egyptians and was known to the Greeks.
- Hippocrates (460-357 BC) prescribed white poppy juice mixed with nettle seed to normalize bowel function.
- Arab traders brought poppy to China. In the Chinese literature, there are surgeon Hua's recommendations for preparing opium and hashish for preparing patients before surgery.
- Arab scholar Avicenna, who is a renowned physician of the Middle Ages as the "father of sleep" because he introduced the use of opium into Islamic medicine.
- Alexander the Great brought poppies to India and Persia in 330 BC. e.
- The beginning of widespread use of opium in China is associated with the spread of the habit of smoking tobacco.
- In Europe and Asia, opium began to be smoked for pleasure in the 16th century, after Columbus introduced tobacco and the method of smoking it through a pipe.
- In 1805, the German pharmacist Sertürner isolated and described the opium alkaloid, which he called morphine.
- In 1832, codeine was synthesized, and in 1848 - papaverine.
- In 1856 syringes appeared which made morphine injections very popular.
- In 1874, the famous British chemist Alder Wright obtained a new chemical substance - diacetylmorphine - from the waste of morphine production in order to help patients who constantly use morphine to gradually wean from it. But Wright's discovery was overlooked. Only in 1898, the great German pharmacologist Heinrich Dreiser, who had previously synthesized aspirin, rediscovered this compound and noticed that it has an analgesic effect, many times stronger than morphine. The compound was named heroin.
- In 1898, the German pharmaceutical company Bayer registered heroin as a drug.
- At the beginning of the XX century. heroin replaced morphine. During the First World War and the Civil War, heroin was called "soldier's medicine." However, doctors soon began to realize that heroin addiction was much stronger than morphine addiction.
- The first country to completely ban the use of heroin was the United States. In 1914, the famous Harrison Pact was issued there, which banned heroin. After the United States, European countries followed the same path.
- Heroin has been completely banned from medical use since 1954.

Task 1

Toxic effects, metabolism and medical use of opiates

Opiate overdose can occur with the intentional or accidental intake of excessive doses of drugs in the body during drug addiction, attempted suicide or murder. In childhood, intoxication of the body is possible with improper control of the drug, with the child, with an overdose of antitussive drugs.

I. The effects of opiates on body systems

Central nervous system:

Respiratory system:

Gastrointestinal tract:

Muscles:

Toxic effects:

- 1)

- 2)

- 3)

- 4)

- 5)

- 6)

II. Consequences of regular opiate use:

1) Mental addiction _____

2) Physical addiction _____

Diagnosis of opium intoxication _____

Symptoms of morphinism _____

Opium withdrawal syndrome is the so-called withdrawal syndrome, which manifests itself in neurological, psychosomatic and somatovegetative disorders when you stop taking drugs from the opium poppy.

Phases of the opium withdrawal syndrome:

1 Phase _____

2 Phase _____

3 Phase _____

4 Phase _____

Opiate metabolism (codeine, heroin):

Pharmacological effects _____

Medical use _____

Consequences of codeine usage _____

Treating of codeine poisoning _____

Desomorphine _____

(structural formula)

Medical use _____

Caution when using promedol _____

Heroin _____

(structural formula)

Toxic effects of heroin _____

Omnopon _____

(structural formula)

Medical use _____

Fentanyl _____

(structural formula)

Toxic and narcotic effects of fentanyl and its analogs _____

Side effects of fentanyl use _____

*Clinical manifestations of fentanyl intoxication*_____

QUESTIONS FOR SELF-CONTROL:

1. General characteristics of opiates.
2. Herbal sources of opiates.
3. The use of opiates in medicine.
4. Antidote therapy for opiate poisoning.
5. Phases of opium withdrawal syndrome.
6. First aid for opiate poisoning.
7. Substitution therapy in the treatment of opiate addiction.
8. Morphine. General characteristics. Toxic effect on the body, symptoms of intoxication.
9. Codeine. General characteristics. Toxic effect on the body, symptoms of intoxication.
10. Omnopon. General characteristics. Medical use.

TESTS

1. Heroin, when ingested, is predominantly metabolized to:

- A. Codeine
- B. 6-Monoacetylmorphine
- C. Morfine
- D. 6-Acetylmorphine

2. A morphine derivative is heroin, which is obtained from morphine by:

- A. Diacetylation
- B. Methylation
- C. Nitration
- D. Sulfonation

3. What is the name of the morphine acetylation product?

- A. Codeine
- B. Hashish
- C. Heroin
- D. Narcotin

4. *To find that the cause of the poisoning is opium and not morphine, it is necessary to prove the presence of:*

- A. Acetate acid
- B. Tropic acid
- C. Salicylic acid
- D. Meconic acid

5. *To establish the cause of drug poisoning: opium or omnopon, it is necessary to conduct additional research on:*

- A. Meconic acid
- B. Morphine
- C. Papaverine
- D. Tebaine

6. *The main alkaloid of opium that causes a severe poisoning is:*

- A. Papaverine
- B. Codeine
- C. Morphine
- D. Anabazine

7. *Which opium alkaloid is not used in medicine?*

- A. Papaverine
- B. Codeine
- C. Morphine
- D. Narcotin

8. *What opium alkaloid is not used in medicine?*

- A. Papaverin
- B. Heroin
- C. Morphin
- D. Codeine

9. *Most of the narcotic and potent substances are obtained from plant materials. Which of the following is synthetically obtained?*

- A. Papaverine
- B. Heroin
- C. Morphine
- D. Narcotin

10. *Morphine was first isolated from opium by:*

- A. Mendeleev D.I.
- B. Serturmer F.
- C. Shvaikova M.
- D. Dreser G.

11. Name a plant that contains opium alkaloids:

- A. Matricaria chamomilla
- B. Opium poppy
- C. Acorus calamus
- D. Cinchona

12. In case of acute intoxication with opiates, the following are used as an antidote:

- A. Unithiol
- B. Aminazine
- C. Atropine
- D. Naloxon

13. In the treatment of opiate poisoning use:

- A. Barbamil
- B. Naltrexone
- C. Unithiol
- D. Caffeine

14. Which drug contains opium alkaloids hydrochlorides:

- A. Barbamil
- B. Naltrexone
- C. Unithiol
- D. Omnopon

15. What alkaloids are found in opium?

- A. Strychnine, brucine, reserpine
- B. Caffeine, theophylline, theobromine
- C. Atropine, scopolamine, cocaine
- D. Morphine, codeine, papaverine

Answers to tests:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

Checked by:

(teacher's signature)

LESSON № 5

TOPIC: Pharmaceutical aspects and the basics of prevention of hallucinogens and amphetamines use and dependence on them.

PURPOSE: To get acquainted with the general characteristics of hallucinogens and amphetamines. To reveal the main mechanisms of the toxic action of LSD, psilocin, phencyclidine, ketamine and dextromethorphan.

PLAN:

1. Problems and main causes of drug addiction.
2. Amphetamines: main representatives, action on the body, first aid and treatment of poisoning.
3. Toxicology of hallucinogens and dissociative psychoactive substances: LSD, psilocin (psilocybin), phencyclidine, ketamine and dextromethorphan.

INFORMATIONAL MATERIAL

Drug addiction has become an acute social phenomenon in Ukraine. The massive distribution of drugs has become a real problem in our society. Drugs spread to all groups of the population, and children began to get acquainted with drugs. In modern Ukraine, the problem of drug use has reached its climax. There are statistics that indicate that the average age of drug users ranges from 16 to 30 years. These are young people who do not even live up to 35 years of age. At the same time, a demographic abyss is formed, in which mortality is not compensated for by fertility. The point is not even that people lose the ability to reproduce offspring, it is just that no one becomes to give birth to children, because the average life expectancy of a drug addict is about 5 years. During this time, the addict manages to destroy his own body, increase the number of drug addicts (most often from among friends and acquaintances) and make his contribution to the drug trade by increasing the market for drugs.

According to the point of view of various researchers (doctors, psychologists, sociologists), **the motives for drug addiction** can be different. The most famous are:

- interest in the action of the narcotic substance;
- desire to be accepted by a certain group;
- expression of their own independence, as well as negative mood in relation to others;
- learning new experience, gives pleasure, worries or contains danger;
- achieving "clarity of thinking" or "creative inspiration";
- achieving a feeling of complete relaxation;
- avoiding life problems and difficulties.

Task 2

Amphetamines: main representatives, effect on the body, first aid and treatment of poisoning

Phenylalkylamine

Cathine

(structural formula)

Cathinone

(structural formula)

Ephedra _____

(structural formula)

Mescaline _____

(structural formula)

Amphetamine:

Methamphetamine:

MDA (methylenedioxyamphetamine):

DOB (2,5-dimethoxy-4-bromamphetamine):

Physicochemical properties of amphetamines

Use of amphetamines

Toxic effects of amphetamines

Toxicokinetics



ephedrone

ephedrine

norephedrine

(draw metabolism scheme)

Toxicokinetics _____

2) Diethyltryptamine (DET) _____

bufotenin

ibotenic acid

muscimol

muscarine

Toxicokinetics _____

3) Phencyclidine (PCP, sernyl) _____

(structural formula)

4) **Dextromethorphan** _____

(structural formula)

Toxicokinetics _____

QUESTIONS FOR SELF-CONTROL:

1. What are the main causes of addiction to phenylalkylamines?
2. Define the concept of phenylalkylamine and indicate the basic principles of their classification.
3. Characterize naturally occurring phenylalkylamine.
4. Indicate the main groups of synthetic phenylalkylamines.
5. Indicate the main physiological effects from the use of phenylalkylamine.
6. Describe the toxic effects of the abuse of amphetamines and methamphetamines.
7. What are the measures of assistance and the basic principles of treatment of amphetamine and methamphetamine poisoning?
8. Formulate the concept of hallucinogenic and dissociative psychotropic substances.
9. Indicate the main physiological effects of the use of lysergic acid diethylamide. What is the negative effect of LSD on the psyche and physical health of a person?

TESTS

1. *The plant khat (Catha edulis) contains an alkaloid:*

- A. Ephedrine
- B. Cathinon
- C. Mescaline
- D. Psilocin

2. *The plant Ephedra equisetina contains an alkaloid:*

- A. Cathine
- B. Muscarine
- C. Psilocybine
- D. Ephedrine

3. *The peyote cactus (Lophophora wiliamsii) contains a hallucinogenic alkaloid:*
- A. Norephedrine
 - B. Mescaline
 - C. Brucine
 - D. Anabazine
4. *One of the symptom of amphetamine use is:*
- A. Constriction of the pupils
 - B. Respiratory depression
 - C. Stimulation of respiration
 - D. Pupil dilation
5. *One of the symptom of amphetamine use is:*
- A. Acceleration of heartbeat
 - B. Respiratory depression
 - C. Heartbeat does not change
 - D. Increased appetite
6. *The physiological symptoms of amphetamine use in humans are:*
- A. Decreased heart rate
 - B. Drop in blood pressure
 - C. Constriction of the pupils
 - D. Acceleration of heart rate
7. *The alkaloid ephedrine is:*
- A. Analgesic
 - B. Alpha-, beta-adrenostimulant
 - C. Hypnotic
 - D. Anticholinergic
8. *The use of amphetamines causes the development of:*
- A. Narcolepsy
 - B. Aggressiveness and psychosis
 - C. Unvarying psycho-emotional state
 - D. State of rest
9. *How does the use of amphetamines affect appetite:*
- A. Decreases
 - B. Does not change
 - C. Rises
 - D. Impact is difficult to predict

10. *Certain amphetamines in certain doses can exhibit:*

- A. Hypotension
- B. Bronchoconstrictor action
- C. Antiarrhythmic action
- D. Hallucinogenic and psychotropic effects

11. *One of the major severe consequences of amphetamine use is an increased likelihood of:*

- A. Stroke
- B. Hypotension
- C. Bronchospasm
- D. Oppression of heartbeat

12. *Methylenedioxyamphetamine causes psychotropic effects, manifested by:*

- A. Deterioration of mood
- B. Improved mood
- C. Depression of consciousness
- D. Increased tension

13. *Methylenedioxyamphetamine is a derivative of:*

- A. Phenol
- B. Furan
- C. Isoquinoline
- D. Phenylalkylamine

14. *The use of methylenedioxyamphetamine causes:*

- A. Physical dependence
- B. Mental addiction
- C. Physical and mental dependence
- D. Emotional addiction

15. *Narcotic drug, that is close to LSD in terms of the strength of the hallucinogenic effects is:*

- A. Methamphetamine
- B. Methylenedioxyamphetamine
- C. Dimethoxybromamphetamine
- D. Ephedrone

Answers to tests:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

Checked by:

_____ (teacher's signature)

LESSON № 6

TOPIC: Pharmaceutical aspects and the basics of prevention of cocaine use and dependence on it

PURPOSE: To get acquainted with the general characteristics of cocaine, its history of use and physical and chemical properties. To reveal the main mechanisms of the toxic effect of cocaine. To master the methods of prevention and treatment of cocaine addiction.

PLAN:

1. History of cocaine use.
2. Physical and chemical properties of cocaine.
3. Coca drugs and cocaine use.
4. The toxic effect of cocaine on the human body and the consequences of its use.
5. Methods for the prevention and treatment of cocaine addiction.

INFORMATIONAL MATERIAL

After opiates, **cocaine** is the second “problem drug” (a narcotic substance, the abuse of which is a significant socio-economic problem). Due to the geographical proximity of the areas of coca cultivation and the production of chemically pure cocaine, the use of this substance is mainly spread in the Americas, which account for 70% of world cocaine consumption, and Western Europe - 22%. In Ukraine, according to the Ministry of Health, the use of stimulant drugs, in particular cocaine, which replaces the use of opiates, has been growing since 2012.

Currently, cocaine is included in the list No. 2 of the UN Convention on Drugs, which determines the possibility of legal use of cocaine for special medical reasons in the international and domestic control over the production, use and distribution.

Task 1

Physicochemical properties of cocaine

1) *Plant raw material* _____

2) *Chemical composition* _____

cocaine

(structural formula)

Cocaine production _____

Task 2

Coca drugs and cocaine use

Coca leaves _____

Cocaine paste _____

Cocaine hydrochloride _____

Cocaine base / crack _____

«Speedball» _____

«Black cocaine» _____

Container-man _____

Task 3

The toxic effect of cocaine on the human body and the consequences of its use

1. The effect of cocaine on the human body: _____

2. Signs of cocaine use: _____

3. *Withdrawal syndrome:* _____

4. *Cocaine toxicokinetics:* _____

QUESTIONS FOR SELF-CONTROL:

1. Cocaine: plant raw materials, physicochemical properties, chemical structure.
2. The toxicological significance of cocaine and the patterns of its behavior in the body.
3. The main directions of the metabolism of cocaine in the human body.
4. Toxicokinetic characteristics of cocaine.
5. The toxic effect of cocaine on the human body and symptoms of cocaine poisoning.

TESTS

1. *Cocaine is a chemical derivative of:*
 - A. Phenanthrene
 - B. Isoquinoline
 - C. Tropane
 - D. Benzofuran
2. *Name the plant that contains cocaine:*
 - A. *Atropa belladonna*
 - B. *Datura stramonium*
 - C. *Hyoscyamus niger*
 - D. *Erythroxylon coca*

3. *During a forensic chemical examination, ecgonine was found in the urine. What substance does this indicate about poisoning?*

- A. Hashish
- B. Atropine
- C. Cocaine
- D. Morphine

4. *What is the pharmacological effect of cocaine hydrochloride?*

- A. Local anesthetic
- B. Pain reliever
- C. Sleeping remedy
- D. Remedy for stimulating the respiratory center

5. *The end product of cocaine metabolism is:*

- A. Etilecgonine and benzoic acid
- B. Ecgonine and benzoic acid
- C. Benzoylecgonine and benzoic acid
- D. Ethylacgonine and oxalic acid

6. *What alkaloids are found in plants of the genus Erytroxylon?*

- A. Cocaine, hygrin
- B. Morphine, codeine
- C. Atropine, scopolamine
- D. Nicotin, pachicarpine

7. *In the illegal drug turnover, an important place is occupied by:*

- A. Trimecaine
- B. Sodium Valproate
- C. Sevin
- D. Cocaine

8. *Cocaine by chemical structure is:*

- A. Polyphenol
- B. Aldehyde
- C. Ester
- D. Alcoholic acid

9. *What is the name of the product obtained from cocaine hydrochloride by extraction with an organic solvent in an alkaline medium?*

- A. Heroin
- B. Promedol
- C. Base of cocaine
- D. Noskapin

10. "Speedball" is a mixture of:

- A. Cocaine and heroin
- B. Cocaine and Anesthesine
- C. LSD and codeine
- D. Cocaine and Promedol

Answers to tests:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

Checked by:

(teacher's signature)

LESSON № 7

TOPIC: Pharmaceutical aspects and the basics of prevention of cannabinoid use and dependence on them.

PURPOSE: To get acquainted with the general characteristics of cannabinoids and physicochemical properties. To reveal the main mechanisms of the toxic effect of cannabinoids on the human body. To master the methods of prevention and treatment of cannabinoid addiction.

PLAN:

1. Historical background on cannabinoid use.
2. Physicochemical properties of cannabinoids.
3. Narcotic drugs from plants of the genus *Cannabis* and the use of cannabinoids.
4. The toxic effect of cannabinoids on the human body and the consequences of the use of drugs from hemp.
5. Methods for the prevention and treatment of cannabinoid addiction.

INFORMATIONAL MATERIAL

Cannabinoids are substances found in different parts of the cannabis (*Cannabis sativa*), known as marijuana. More than 30 different cannabinoids have been identified in cannabis, the main of which is tetrahydrocannabinol, which is responsible for the intoxicating effect when taken internally. Addictions, which arise in connection with the abuse of drugs from hemp, occupy one of the first places in the world in terms of prevalence. Hemp has long been widely used in light industry, construction and food industries. Hemp is grown as an important spinning plant, yields hemp oil, which is used in food, for painting, soap making, etc., as well as for the prevention and treatment of a number of diseases.

Currently, cannabis and its drugs are on the list No. 1 of the Standing Committee on Drug Control, which prohibits their use for any, including medical, purpose. According to a 2008 report by the International Narcotics Control Board (INCB), new, more potent cannabis strains have been cultivated in the world over the past two decades, with levels of tetrahydrocannabinol (THC) significantly higher than levels usually recorded in the 1980s. century. The use of these cannabis strains significantly increases the risks of developing cannabinoid addiction.

In European countries, the legislation on the abuse of marijuana is rather mild, because it is believed that addiction develops slowly and the harmfulness to the body is small compared to "hard" drugs. And therefore, in order to decriminalize cannabis drugs in some countries of the world, an active campaign is being carried out to legalize them (the Netherlands, Great Britain, Canada, some states of America). In Ukraine, according to the "List of Narcotic Drugs, Psychotropic Substances and Precursors" approved by the Cabinet of Ministers of Ukraine dated May 6, 2000 No. 770, cannabis, cannabis resin are especially dangerous drugs, the circulation of

which is prohibited in Ukraine, and tetrahydrocannabinol and a number of its isomers belong to especially dangerous psychotropic substances, the circulation of which is also prohibited.

Task 1

Physicochemical properties of cannabinoids

Cannabinoids - _____

delta9-tetrahydrocannabinol
(structural formula)

cannabidiol
(structural formula)

cannabinol
(structural formula)

delta8 - tetrahydrocannabinol
(structural formula)

Task 2

Cannabis drugs and cannabinoid uses

Marijuana

Hash oil

Hashish

Bang

Ganja

Sinsemilla

Smoking mixtures (spice)

Ways of use of cannabis drugs:

Use of cannabinoids in medicine:

Task 3

The toxicological effect of cannabinoids on the human body and the consequences of the use of drugs from hemp

The first attempts to use hashish (usually in the form of smoking) may not have any effect or cause a short-term anxiety. Hashish intoxication is expressed in the appearance of a feeling of lightness, relaxation, and high spirits. The perception of space, sounds, time is disturbed, the size of objects, the intensity of their color change. There is a hypomanic mood, a quick change of ideas, an overestimation of one's capabilities, carelessness, ease in making decisions, laughter for no reason. Intoxication is accompanied by flushing of the skin of the face, dilated pupils, uncertain gait, confusion of the tongue, dry mouth, thirst, increased appetite. Patients look slow, sluggish.

The threshold dose is 50 mg of tetrahydrocannabinol per 1 kg of body weight. A picture of intoxication is caused by 150-200 mg of tetrahydrocannabinol, 300-400 mg lead to loss of consciousness, the appearance of a deception of perception.

1. Signs of cannabis drug use:

2. Toxic effects of cannabinoids:

2. *Name the main active ingredient of cannabis seed:*

- A. Canabinol
- B. Narcotine
- C. Heroin
- D. Cocaine

3. *What drugs are obtained from cannabis plant?*

- A. Atropine, scopolamine
- B. Morphine, codeine
- C. Cocaine, heroin
- D. Marijuana, hashish

4. *The main active ingredient in marijuana is:*

- A. Barbamil
- B. Narcotine
- C. Tetrahydrocannabinol
- D. Cocaine

5. *What narcotic drug is obtained from seed hemp with the addition of a synthetic analogue of tetrahydrocannabinol?*

- A. Hashish
- B. Hash oil
- C. Marijuana
- D. Spice

6. *What is marijuana?*

- A. Plant material extract or cannabis resin
- B. Dried and shredded upper part of the plant with leaves and flowers
- C. Dried hemp roots
- D. Resin produced by cannabis during a specific period of plant development

7. *What is hashish?*

- A. Resin produced by cannabis during a specific period of plant development
- B. Plant material extract or cannabis resin
- C. Dried and shredded upper part of the plant with leaves and flowers
- D. Dried hemp roots

8. *What is the narcotic effect of "Spice"?*

- A. Excites the respiratory center
- B. Psychoactive effect
- C. Pain relieving effect
- D. Inhibit acetylcholinesterase

9. "Smoking mixtures" are:

- A. Dried hemp plant raw materials
- B. Dried plant raw materials with added synthetic cannabinoids
- C. Marijuana cigarettes
- D. Plant material extract or cannabis resin

10. For the treatment of which disease cannabis and cannabis preparations be used in complex therapy?

- A. Arterial hypertension
- B. Coronary heart disease
- C. Oncological diseases
- D. Diabetes mellitus

Answers to tests:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

Checked by:

(teacher's signature)

LESSON № 8

TOPIC: Pharmaceutical aspects and the basics of prevention of psychotropic drugs use and dependence on them.

PURPOSE: To get acquainted with the general characteristics of psychotropic drugs. To reveal the main mechanisms of action of tranquilizers, antipsychotics and hypnotics.

PLAN:

1. Toxicological significance of the main groups of psychotropic drugs.
2. Tranquilizers - derivatives of 1,4-benzodiazepine: main representatives, effects on the body, first aid and treatment of poisoning.
3. Antipsychotics - phenothiazine derivatives: main representatives, effects on the body, first aid and treatment of poisoning.
4. Hypnotics - derivatives of barbituric acid: main representatives, effects on the body, first aid and treatment of poisoning.

INFORMATIONAL MATERIAL

Throughout the history of mankind, for various reasons, in particular, to restore lost strength, for the purpose of treatment or for carrying out religious rituals, substances have been used that change mood, sensation or behavior.

Currently, such substances are called **psychotropic**. Psychotropic drugs selectively affect emotions, cognition and human behavior. According to the WHO, one third of the adult population in developed countries is taking psychotropic drugs. These drugs are intended for use in the case of mental disorders and the so-called borderline states.

The beginning of the use of psychotropic drugs is associated with 1952, when a group of French psychiatrists successfully used chlorpromazine to relieve psychomotor agitation. This drug, to this day, remains one of the main drugs for the treatment of schizophrenia and other mental disorders.

All psychotropic drugs are divided into 6 groups:

- Narcotic drugs (morphine, codeine)
- Antipsychotics (chlorpromazine, propazine)
- Antidepressants (imizine, amitriptyline)
- Analeptics (caffeine)
- Psychostimulants (phenamine, indopan)
- Tranquilizers (phenazepam, nozepam, chlosepide).

Some of the most important in toxicological terms are tranquilizers - derivatives of 1,4-benzodiazepine; antipsychotics - phenothiazine derivatives and hypnotics - barbituric acid derivatives.

Side effects in psychopharmacotherapy, as in the use of many other drugs, associated with the inability to selectively affect only pathologically altered brain systems. Some of them are directly related to the therapeutic effect of drugs and occurs in most patients taking this drug. For example, neuroleptic syndrome when using first generation antipsychotics.

Some of the side effects are manifested in the form of infiltrates associated with local tissue irritation at the injection sites of solutions of psychotropic drugs in the form of dyspeptic phenomena resulting from their toxic effects, occurs in many patients at the initial stages of treatment and directly depends on the size of the doses used.

Another part of side effects (mainly in the form of dysfunction of the central nervous system - extrapyramidal and autonomic disorders) occurs at different stages of treatment in a significantly smaller number of patients and is associated with individual sensitivity to psychotropic drugs. In these cases, the severity of side effects does not always depend on the size of the doses of drugs used.

Task 1

Tranquilizers - derivatives of 1,4-benzodiazepine: main representatives, effects on the body, first aid and treatment of poisoning

Benzodiazepine derivatives (1,4-benzodiazepines)

Diazepam (sibazone)

Nitrazepam (radedorm)

Oxazepam (tazepam)

Chlordiazepoxide (Chlosepide)

The main directions of metabolism of 1,4-benzodiazepine (display the scheme of metabolism)

1) oxidation and N-demethylation:

2) N-dealkylation:

3) reduction:

4) formation of glucuronides:

5) hydrolysis - rupture of the azine cycle:

There are 3 degrees of benzodiazepine poisoning:

Light degree:

Medium degree:

Severe degree:

Task 2

Antipsychotics - phenothiazine derivatives: main representatives, effects on the body, first aid and treatment of poisoning

Phenothiazine derivatives (sedative antipsychotics):

Aminazine
(structural formula)

Diprazine
(structural formula)

Tizercin (levopromazine)
(structural formula)

Effects on the body:

The main directions of metabolism of phenothiazines:

1) demethylation:

2) oxidation of a heterocyclic sulfur atom to sulfoxide and sulfone:

Principles of acute poisoning treatment:

Task 3

Sleeping pills - derivatives of barbituric acid: main representatives, effects on the body, first aid and treatment of poisoning

Barbiturates

Barbital
(structural formula)

Phenobarbital
(structural formula)

Barbamil
(structural formula)

Этаминал натрия
(structural formula)

Etaminal sodium
(structural formula)

The natural detoxification processes associated with barbiturate poisoning include: _____

Lethal doses of barbiturates:

Mechanism of toxic effects of barbiturates:

Causes of death:

There are 4 clinical stages of intoxication with barbiturates:

1 stage

2 stage

3 stage

4 stage

When poisoning with barbiturates, the following violations are characteristic:

Diagnosis of barbiturate intoxication:

Treatment of acute poisoning with barbiturates:

Prevention of re-poisoning with barbiturates:

First aid measures:

QUESTIONS FOR SELF-CONTROL:

1. Structure and physicochemical properties of 1,4-benzodiazepine derivatives.
2. Toxicological characteristics and mechanism of toxic action of 1,4-benzodiazepine derivatives.
3. Directions of metabolism of 1,4-benzodiazepine derivatives.
4. General principles of treatment of poisoning with derivatives of 1,4-benzodiazepine.
5. Measures to prevent poisoning and abuse of 1,4-benzodiazepine derivatives.
6. Structure and physicochemical properties of phenothiazine derivatives.
7. To what pharmacological group do phenothiazine derivatives belong? Their role in modern medicine.
8. Toxic effect of phenothiazines on the body and symptoms of acute and chronic poisoning.
9. First aid measures for phenothiazine poisoning and the main directions of treatment of poisoning.
10. Chemical structure and physicochemical properties of derivatives of barbituric acid.

TESTS

1. According to the "List of narcotic drugs, psychotropic substances and precursors", approved by the Cabinet of Ministers of Ukraine dated 06.05.2000 (No. 770), barbital is included in:

- A. Particularly dangerous narcotic drugs, the circulation of which is prohibited
- B. Especially dangerous psychotropic substances, the circulation of which is prohibited
- C. Narcotic drugs with limited circulation
- D. Psychotropic substances, the circulation of which is limited and in respect of which certain control measures may be excluded

2. *What pharmacological group does phenobarbital belong to?*

- A. Sleeping pills
- B. Narcotic analgesics
- C. Antipsychotics
- D. Tranquilizers

3. *According to the "List of narcotic drugs, psychotropic substances and precursors" approved by the Cabinet of Ministers of Ukraine dated 06/05/2000 (No. 770) diazepam is included in:*

- A. Particularly dangerous narcotic drugs, the circulation of which is prohibited
- B. Especially dangerous psychotropic substances, the circulation of which is prohibited
- C. Narcotic drugs with limited circulation
- D. Psychotropic substances with limited circulation and for which certain control measures may be excluded

4. *What pharmacological group does chlorpromazine belong to?*

- A. Sleeping pills
- B. Antihistamines
- C. Antipsychotics
- D. Tranquilizers

5. *Chewing what drug causes swelling of the oral mucosa?*

- A. Phenobarbital
- B. Aminazin
- C. Diazepam
- D. Radedorm

6. *Which of the following preparations contains sulfur?*

- A. Barbamil
- B. Aminazin
- C. Phenobarbital
- D. Diazepam

7. *What drug overdose causes dry mouth?*

- A. Barbitol
- B. Nitrazepam
- C. Diprazin
- D. Codeine

8. *Which of the following substances belongs to tranquilizers?*

- A. Tizercin
- B. Diazepam
- C. Geksenal
- D. Promedol

9. Most often, when poisoning with phenothiazines, death occurs:

- A. In the first hours of poisoning
- B. During the day
- C. For 2-3 days
- D. For 4-5 days

10. Which of the following substances belong to antipsychotics?

- A. Diazepam
- B. Aminazin
- C. Caffeine
- D. Barbital

Answers to tests:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

Checked by:

(teacher's signature)

LIST OF QUESTIONS FOR THE CREDIT LESSON

1. Formulate the main tasks that narcology solves.
2. Give a definition of the terms "drug", "psychotropic substance", "psychoactive substance".
3. What are the medical, social and legal aspects of the problem of drug addiction terminology?
4. Give a definition of the terms "addiction", "substance abuse". What is the reason for the possibility of transforming the diagnosis of "substance abuse" into the diagnosis of "drug addiction" and vice versa?
5. Large addiction syndrome and its constituent parts.
6. Altered addiction syndrome and its components.
7. Give a definition of the concept of "withdrawal symptoms" and name the cause of its occurrence.
8. What is the syndrome of altered reactivity of the body in diseases of drug addiction and substance abuse? Give examples.
9. Give a definition to the concept of "toxicomania (drug addiction) intoxication". Interrelation of toxicomaniac intoxication with acute poisoning with surfactants.
10. Types of classification of narcotic and psychoactive substances.
11. Classification of narcotic and psychoactive substances by origin.
12. Give examples of psychoactive substances of plant origin.
13. Give examples of semi-synthetic and synthetic psychoactive substances.
14. Classification of psychoactive substances according to the specificity of their action on the body. Give examples.
15. Classification of psychoactive substances according to the degree of restriction of use and circulation.
16. Name the main groups of narcotic and psychotropic substances according to the national "List of narcotic, psychotropic substances, their analogues and precursors, subject to special control in accordance with the current legislation of Ukraine."

17. Give a definition of the concept of "precursor" used in the control over the circulation of narcotic and psychotropic substances. Give examples of precursors.
18. Classification of surfactants by physical and chemical properties. Scope of the specified classification.
19. What are the stages of drug addiction?
20. Name the stages of drug addiction and substance abuse treatment.
21. What are the methods of treatment for drug addiction and substance abuse?
22. What is substitution maintenance therapy?
23. Forms of psychotherapy in the treatment of drug addiction and substance abuse.
24. Name the methods of active detoxification of the body in acute poisoning.
25. Organization of drug treatment in Ukraine.
26. Methods for the diagnosis of drug addiction and substance abuse.
27. The main types of measures for the prevention of alcoholism, drug addiction and substance abuse.
28. Highlight the legal method of combating drug addiction at the international level.
29. What is the legal method of combating drug addiction at the national level? Give examples of major activities.
30. The role of preventive work in society to prevent alcoholism, drug addiction and substance abuse and its main aspects.

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