Ministry of Public Health of Ukraine
National O.O. Bogomolets Medical University
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STUDY GUIDE

for THE PRACTICAL CLASSES COURSE

“PHARMACOLOGY”

Module I

MODULE I
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P. W. 1
Theme:
Introduction to pharmacology and medicinal prescription.
Solid medicinal forms.

Prescription is a part of pharmacology. It is divided into *pharmaceutical prescription,* which study rules of drug's production, and *medical prescription* that study the rules of prescription writing.

Drug substances have different *sources.* They can be obtained from the plants, animals, minerals, bacteria, and fungi. Drugs, produced from the plants by simple processing (drying and mixing), are called *simple.* They are used seldom. *Composite* drugs are produced from plant origin by more complex processing. For example, *Galen's* and *neo-Galens drugs.* They are both containing sum of plant's active substances. Galen's drug is obtained by spirit or another kind of extraction from a plant, e.g. tinctures, extracts; usually it contains ballast or non-active substances. However, neo-Galen's drug is subjected to more composite processing: it is more pure and can be used parenterally.

Drug form is a shape that is given to the drug substance. According to their condition drug forms are divided into *solid,* (powders, capsules, tablets, dragee, granules), *liquid* (infusions, decoctions, mixtures, tinctures, fluid extracts, solutions), and *soft* (ointments, fluid ointments, pasts, suppositories, plasters). Also drug forms can be *dosed,* which are usually act after reaching of the bloodstream, and *non-dosed,* which as the rule act topically. *Drug substance* is a chemical compound that provides drug's action. *Drug* is a drug substance, produced in concern drug's form.

Pharmacopoeia is a work containing monographs of therapeutic agents, standards for their production strength, purity, and their formulations. Pharmacopoeia includes especial *list A* (agents with high toxicity, poisons, and agents of abuse), *list B* (potent drugs of strict supervision).

Prescription is written proposition of physician for pharmaceutist to produce and/or to sale a concern drug. It is a written formula for the preparation and its administration. Also, prescription is a juridical document, because it is observed when the Tightness of treatment is doubtful.

PARTS OF PRESCRIPTION.

1. **Inscriptio** - tells official data about hospital (title and address), physician, who writes prescription (surname, initial), and patient (surname, initial, age). It is written in national language.

2. **Prepositio** - consisting of the word *recipe,* take, or its sign. *"Rp.:* "

3. **Designatio materiarum** (list of agents) is the main part of the prescription, containing the names and amounts of the drugs ordered. Each drug sub-

stance is written in own line from capital letter, in genitive case, and in Latin. Words can not to be shortened and broke. Doses are written by figures. If ingredient is only one receipt is *simple*, if many - *complex.*

Drug substances are divided according to their importance.

a. *Remedium cardinale (s. basis)* - drug substance, which carries the main treating effect.

b. *Remedium adjuvants* are the substances with additive action.

c. *Remedium constituents* - shape-making substance. A constituent is to be indifferent (non-active).

d. *Remedium corrigens* - substances bettering taste, smell, type. Corrigens is usually - sugar, ether oils, syrups.

4. **Subscriptio** - directions for mixing of the ingredients and designation of the form (pill, powder, solution, etc.) in which the drug is to be made, e.g., beginning with the word, *misce*, mix, or its abbreviation, M., *fiat*, make, or its abbreviation, f. and name of drug form (*pulvis*, powder). Also it can includes the quantity, *Da (D.)* give, *tales (t.),* such; *doses (d.) N*, number.

5. **Signatura** - directions to the patient regarding the dose and times of taking the remedy that is preceded by the word *signa,* designate, or its abbreviation, (S.). It is written in national language

6. **Nomen medici** - signature and own stamp of physician.

Prescription in special cases. It is concern narcotic substances and other similar substances. Special blanks for strict calculation are done for this purpose. Those blanks have serial number. They are covered by pink drawing and are proved by stamp *of* hospital and signature *of* its head. Prescriptions on poisonous substances including spirit are proved by special stamp of hospital. Prescription for privilege using (free of charge for 80 %), are proved by stamp of hospital also. During emergency prescription of a drug we write *"cito!"*, quickly in upper left corner.

Dose - is a quantity *of* the drug substance that can be expressed in milliliters, grams, and international unites. There are doses - moment, daily, curative, and minimal, median or maximal therapeutic.

Prescription can indicate moment (for one time) dose of agent and its quantity. It is *distributive way* of prescribing. Tablets, powders, etc are prescribed in this way. During *divisive way* we prescribe summary dose and patient has to divide it on moment before using only, e.g., mixtures, decoctions. *Magisterial prescription* - prescription that is compiled by physician. *Officinal prescription* - prescriptions of already produced drug substances.

SOLID MEDICINAL FORMS

Powder (pulvis, pulv.) is a homogenous dispersion *of* finely divided, relatively dry, particulate matter consisting of one *(simple)* or more *(complex)* substances.

Simple nondivided powder:

Rp.: Anaesthesini 25,0

D.S. Apply on the injured part of skin.

Its weight is limited 0,1-1,0 g, optimal weight is equal 0,3 g. If basis weight is less 0,1 g, indifferent form-making substance such as sugar (**Saccharum**), glucose (**Glucosum**) are added.

Rp.: Platyphyllini hydrotartratis 0,005

Sacchari 0,3

Misce fiat pulvis

Da tales doses N. 6

S. 1 powder 3 times a day.

If basis is enough by weight, we don't add form-making substance.

Simple divided powder:

Rp.: Pancreatini 0,5

D. t. d. N. 6

S. Take 1 powder orally to combat headache.

#

Complex divided powder :

Rp.: Amidopyrini 0,3

Coffeinum-natrii benzoatis 0,1

M. f. pulv.

D. t. d. N. 6

S. Take 1 powder orally during headache.

Complex nondivided powder

Rp.: Natrii chloridi 15,0

Natrii hydrocarbonatis 20,0

M. f. pulv.

D. S. Take spoonful of powder orally 2 times a day.

- this sign usually separates two prescriptions.

Capsule (**capsula**, **caps**., genitive case - **capsulae**) is a solid dosage form, which the drug is enclosed in either a hard or soft soluble container or suitable form of gelatin. Capsule remove probable unfavorable taste, smell; prevent from irritation of oral cavity and stomach mucosa, and drug's inactivation by stomach juice. Nowadays capsules are produced at the factories, that's why they are prescribed *shortened (brief) form*

Rp.: Chinini sulfatis 0,2

D. t. N. 10 in caps.

S. By 1 capsule 5 hours before attack.

Tablet (**tabuletta**, **tab**., genitive case - *sing.*, **tabulettae**, *pl*., **tabulettarum**) solid dosage form containing medicinal substances; it may vary in shape, size, weight. Tablets may be complex and simple according to amount of active substance. They always include inactive ingredients, but physician doesn't consider them.

Shortened form (for simple prescriptions only):
Rp.: Tabulettarum Reserpini 0,00025 N. 50
D.S. By 1 tablet 3 times a day.

Full form (for simple and complex prescriptions):
Rp.: Reserpini 0,00025
D. t. d. N. 50 in tabulettis
S. By 1 tablet 3 times a day

Rp.: Acidi acetylsalicylici
Phenacetini ãã 0,25
Coffeinum-natrii benzoatis 0,1
D. t. d. N. 10 in tabulettis
S. 1 tablet to combat headache.

Ana, ãã or both means that ingredients have similar weight.

Patented tablet consists of one or more substances with fixed (determined) weight. It is written without weight. Patented tablet like a sign, under which one or more active agents are present.
Rp.: Tabulettarum "Pentalginum" N. 10
D.S. Take 1 tablet orally to combat headache.

Dragee (**dragee**, **dr**.) is a solid dosage form. It is a sugarcoated small globular mass of some coherent but soluble substance, containing a medicinal substance to be swallowed. Consecutive tracing of drug substances produces it. Rules of dragee prescription are the same as tablets.
Rp.: Dragee Acidi ascorbinici 0,05 N. 10
D.S. Take orally by 1 dragee 3 times a day.

General questions:

1. Medicinal prescription. Medicinal substance, remedy, drug and form. Galenic and novogalenic medicinal drugs.
2. The prescription, its structure. The rules of prescription writing and drug serving.
3. The particularities of prescriptions writing for poisonous, strong effective substances and for the ones, which cause drug addiction.

4. The state Pharmacopoeia of Ukraine.
5. Classification of the medicinal forms. Officinal and magistral prescriptions.
6. Solid drug forms, their classification.
7. Powders: simple and compound ones, divided and non-divided powders.
8. Powders for internal and external use. Minimal mass of divided and non-divided powders.
9. Tablets and dragee: characteristics, writing the prescriptions.
10. Characteristic and writing the prescriptions of capsules.
11. Other solid drug forms.

Educational research work.

Assignment 1. *Study the lists of the state Pharmacopoeia.*

Assignment 2. *Study the structure of the prescription.*

Assignment 3. *Study the classification of the medicinal forms:*

1. By the routs of drug administration: external, internal, injections.
2. By the physical condition:

- Solid (powders, tablets, dragee, capsules, granule, caramel, pill, pencil and etc.)
- Soft (ointments, creams, pastes, liniments, suppositories, plasters, etc)
- Liquids (solutions, for external and internal use, mixtures, infusions, decoctions, tinctures, liquid extracts, emulsions, slimes, etc)

Assignment 4.

Study the classification of the powders:

Powders	Weight, g	Constituens
Divided and simple herbal	0,1-1,0 0,05-1,0	-
Divided and compound herbal	0,1-1,0 0,05-1,0	Saccharum, Saccharum lactis, Pulvis Glycyrhizae
Non-divided and simple	50,0-100,0	-
Non-divided and compound	50,0-100,0	Talcum, Amylum, Bolus alba, Zinci oxydum

Assignment 5.

Prescribe:

1. 20g 10 % aspersion of Streptocidum. Apply to the affected areas of the skin.
2. 30g powder of Natrii sulfas for taking orally; previously it must be dissolved in a glass of warm water.
3. 50g 5 % aspersion of Acidum salicylicum for applying to injured skin.

4. Tropacinum (onetime dose – 0.15) for taking orally (1 powder - twice a day).
5. Powder of Digitalis leaf (o.d. 0.05) for taking orally (1 powder - twice a day).
6. 50 tablets of Prednisolonum (o.d. 0.05g) for taking orally (1 tablet - 3 times a day).
7. 10 dragee of Diazolinum (o.d. 0.05g). To take orally (PO) 1 dragee twice a day.
8. Oxacillinum-natrii (o.d 0.25g) in gelatinous capsules to take orally 2 capsules 4 times a day.

P. W. 2
Theme:
Soft medicinal forms.

The ointments, creams, pastes, liniments, suppositories and plasters are soft medicinal forms.

1. Ointments ***(Unguentum)*** are soft medicinal forms having a soft consistence and appointed for external application.

Ointments are intended for applying on the skin, the wounds, the ulcers, mucous membranes (nose, eyes). Ointments are obtained by mixing various medicinal substances *(bases)* with form-building substances *(constituents)* named the unguentum bases.

Ointment bases by itself may have a local influence. By covering the skin and mucus membranes, they provide a protective layer.

Ointment bases reduce skin sensitivity, increase its elasticity and decrease its heat return. They have anti-inflammatory, antiseptic and anti-virus properties.

The kinds of the ointment's bases:

a) *Hydrophobic* (*Vaseline, Lanolin; clearance pig, goose* and *bull fats;* plant oils etc)

b) *Hydrophilic (gels)*

Ointments are non-dosed medicinal forms. The total quantity of the ointment for skin (mucous) treatment is ***20-100 g;*** eye ointment - ***5-10*** *g.*

The basis of eye ointment is mix from *10 parts* of non-aqueous *Lanolin* and *90 parts* of special *Vaseline "for eye ointments "*. Ointments are prescribed in full and short forms.

Prescription is beginning from the word *Unguenti (Ung.).* The percentage of the active substance is indicated in % or in mass units in short prescription. In full form prescription all ingredients of the ointment are indicated.

Ointment that consists of only one compound is prescribed in the shortened way:

Rp.: Unguenti Resorcini 10 % 100,0
D.S. Apply on the injured surface.

Ointment that includes two and more active substances is prescribed in complete method. Unlike shortened variant, quantity of substances in full variant is expressed in grams. For example, prescribe 50.0 g of ointment that consists of Anaesthesinum (1%) and Xeroforminum (10%).

First of all, we have to convert per cents in grams with the help of ratio.

100% of ointment - 50,0 (grams) of ointment

1 % of anaesthesinum - X (grams) of anaesthesinum

X = 50,0x1 / 100 = 0,5. Weight of Xeroforminum: 50x10 / 100 = 5,0

Rp.: Anaesthesini 0,5
Xeroformini 5,0
Vaselini ad 50,0
Misce fiat unguentum
D.S. Apply on the injured skin surfaces.

For officinal ointments (unguentum Zinci, unguentum Hydrargyri oxydi flavum, unguentum Glycerini, unguentum Naphthalani) concentration is not identified.

Rp.: Ung. Zinci 50,0
D.S. Apply on the injured skin surfaces.

For eye ointments it is necessary to write "Eye ointment" in signature.

Rp.: Ung. Atropini sulfatis 1% 5,0
D.S. Eye ointment. Apply on the right eye eyelid before bedtime.

2. Pastes are dense ointments, which contain medicinal ingredients in powder from 25 to 65% (in dental practice 75-100%).

If the quantity of the powder substance in the paste is less than 25% one or more inert powders should be added *(Talcum, Amylum, Zinci oxydum. Bolus alba).*

If paste includes only one active substance, or it is produced in patented form, prescription will has shortened form:

Rp.: Pastae Resorcini 10% 100,0
D.S. Apply on the injured surface.

In others cases complete method is used. For example, prescribe 100,0 g of paste with follow composition: Acidum salicylicum (5%), Acidum boricum (1%), Zincum oxydum (15%).

Sum of all solid form of this composition is 21%. It is not enough for paste. We have to add talc, e.g., 10%. In this case sum will be 31% that is enough. Than we have to expressed weight of substances in grams.

100% of paste – 100,0 g of paste

5% of Acidum salicylicum - X g of Acidum salicylicum

X= 5x100,0/100 = 5,0 g.

Weight of Acidum boricum = 1 x 100,0 / 100 = 1,0 g). Weight of Zincum oxydum =15 x 100,0 /100 = 15,0.

Rp.: Acidi salicylici 5,0
Acidi borici 1,0

Zinci oxydi 15,0
Talci 10,0
Vaselini ad 100,0
M. f. pasta
D.S. Apply on the injured surface.

Magistral pastes are prescribed only in full form (with the indication of all ingredients and its amount). Pastes, which are made in factories are prescribed in a short form.

Dental pastes contain not less than 75% of solid substances. Basis for dental pastes is Glycerinum, it is added by drops, in prescription it is written "quantum satis" (q.s.).

Rp. Tricresoli 4,0
Formalini 1,0
Boli albae 8,0
Glycerini q.s.
Ut f. pasta
D.S. Put into tooth cavity.

3. Liniment (Lininientum, Lin., in genitive case - **Linimenti)** or **fluid ointment** is a soft preparation for external application. It is a thick liquid at room temperature, but melts at body temperature. Vegetable oils, e.g., sunflower seed oil **(Oleum Helianthi, Oleum Lini, Oleum Vaselini)** are used as a form-making substance for liniments.

The prescription rules are the same as ointments:

Rp.: Linimenti Synthomycini 10% 100,0
D.S. Apply on the injured surface.
#
Rp.: Xeroformini
Olei Helianthi ana 20,0
M. f. linimentum
D.S. Apply on the injured surface.

An officinal liniment:
Rp.: Linimenti Vipratoxi 50,0
D.S. Apply on die injured surface.

4. Suppositories ***(Suppositoria)*** are the dosed medicinal form, solid at 25° C and melting at body t°, are intended for introduction into body cavities.

There are rectal *(Supp. rectalia)* and vaginal *(Supp. vaginalia)* suppositories, and sticks *(Bacilli).*

The basis used for making suppositories is *cocoa oil (Oleum cacao)* and *Butirol.*

Magistral prescriptions are written in full form (indicating all ingredients and their doses).

The officinal suppositories are prescribed in short form.

The weight *of rectal* suppositories is *1,1-4,0 g* (in pediatrics – *0,5-1,5 g).* If the weight of the rectal suppositories is not indicated, they are made in weight *3 g.*

The weight of the *vaginal* suppositories: *1,5-6,0 g.* If the weight of the vaginal suppositories is not indicated, they are made in weight *4 g.*

For prescription of suppositories produced in drug-store we use full-form "Basis" (active substance) is written first of all for the prescription of suppositories. Than it must be form-making substance. In subscription we have to write Misce fiat suppositorium, M. f. supp. (mix let it be suppository) rectale or vaginale. In signature we indicate how to use them.

Rp.: Omnoponi 0,24
Olei Cacao 3,0
M. f. supp. rectale
D. t. d. N. 10
S. 1 suppository into the rectum before sleep.

#

Rp.: Trichomonacidi 0,05
Ol. Cacao 4,0
M. f. supp. vaginale
D. t. d. N. 10
S. 1 suppository into the rectum before sleep.

It is possible to prescribe suppositories in short form:

Rp.: Suppositorium cum Ichthyolo 2,0
D. t. d. N. 10
S. 1 suppository into the rectum before sleep.

#

Rp. Suppositoria “Bethiolum” N. 10
D.S. 1 suppository into the rectum before sleep.

5. Plasters *(Emplastra)* - the medicinal form as the plastic mass, possessing the ability to be softened at a body t^o and to be sticked to the skin or in the same mass on the flat carrier.

General questions:

1. General characteristics of soft medicinal forms.
2. Suppositories. General characteristics and use of suppositories. Rectal and vaginal suppositories. Types of suppository prescriptions.
3. Ointments. General characteristics, types of ointment prescription: spread and short ones. The ways of their concentration indication. Officinal ointments.
4. Pastes. The composition and use of pastes, their difference from ointments. Types of prescriptions of pastes.
5. Liniments. Difference in liniments from ointments. Types of liniment prescriptions.

Home task on prescription.

Prescribe in spread and short form:

1. Magnesii oxydum in non-divided powder for taking orally ½ teaspoonful after meal.
2. 50g aspersion of 3% Anaesthesinum and 10% Zinci oxydum.
3. 20 powders and tablets of Natrii hydrocarbonas (0.5g) for taking orally after meal.
4. 10 powders of Extractum Belladonnae siccum (o. d. 0.015g), Magnesii oxydum and Natrii Hydrocarbonas (o. d. 0.25g) for taking orally 1 powder after meal.
5. 20 powders and rectal suppositories of Pulvis folii Digitalis (o. d. 0,05g) for taking twice a day.
6. 30 tablets and powder of Acidum ascorbinicum (o. d. 0,05g), Acidum folicum (o. d. 0.002g) for taking orally three times a day after meal.
7. Theophyllinum (o. d. 0.2g) for introduction in the rectum (one suppository twice a day), give out 10 suppositories.
8. 10 suppositories of Trichomonacidum (o. d. 0.25g) for introduction into vagina (1 suppository before sleep).
9. 50g of the ointment and paste of 10% Anaesthesinum for applying to the skin injury.
10. 30g of the ointment of 3% Prednisolonum for applying to the skin injury.
11. 25 g of the paste containing 10% of Sulfamethoxazolum and 10% of Zinci oxydum in necessary amount for applying to the burn wound surface.
12. 5 g of the officinal ointment “Hydrargyrum oxydi flavum”. Ointment for eyes.
13. 10g eye ointment of 1% Atropinum sulfas.
14. Chloroformium, henfane oil (Ol. Hyosciami) and sunflower oil (Ol. Helianthi) taken in equal parts for preparing 45g of liquid ointment.

Educational research work

Assignment 1.

Prescribe in spread and short form:

1. 10 rectal suppositories containing Anaesthesinum (o. d. 0,5g) for introduction per rectum twice a day.
2. 10 vaginal suppositories containing Tanninum (o. d. 0,3g) in all possible way. To introduce per vagina 1 suppository twice a day.
3. 50 g ointment and paste containing 10% Streptocidum for application to the affected areas of the skin.
4. 20 g ointment of 1% Hydrocortisonum for application to the affected areas of the skin.
5. 10 g ointment containing 1% of Mentholi and 2% of Acidi borici to apply to the nasal mucouse membrane in case of rhinitis.
6. 50 g the officinal ointment of Zinci for applying to the affected areas of the skin
7. 60 g liniment containing Chloroformium, Oleum Camphoratum, Oleum Hyosciami and Ol. Terebinthinum in equal amounts for rubbing into the skin.
8. 10 officinal suppositories "Anaesthesolum". To introduce 1 suppository per rectum twice a day.
9. 100 g liquid ointment containing 3% of Xeroformium for rubbing into the skin.
10. 70 g paste of 5% Dermatolum for applying to the affected areas of the skin.
11. 25 g of the liniment containing 5% Streptocidum.

Assignment 2.

Prescribe the basis used for making:

- suppositories, ointments, pastes and liniments

P. W. 3.
Theme:
Liquid medicinal forms.

Solutions, slimes, emulsions, suspensions, infusions and decoctions, tinctures, liquid extracts, mixtures, new galenic preparations, are liquid medicinal forms.

1. Solutions *(Solutiones)* - are liquid medicinal forms, which are made by dissolving non-liquid medicinal substances in a solvent.

Solutions are homogenous systems that consist of one or more acting substances and are used internally, externally, for washings of cavities and for injections.

They are obtained by dissolution of a solid medicinal substance or a liquid one in the solvent.

Distilled water is usually used as a solvent, less often - ethyl alcohol, glycerin, liquid oils (*peach - Oleum persicorum, olive - Oleum Olivarum etc).*

Solutions for internal application are dosed by drops, table - (15 ml), dessert - (10 ml) and teaspoons (5 ml) or graduated glasses.

Concentration of the solutions could be labeled in one of three different ways:

- In percentage
- In ratio (e.g. 1:1000, 1:5000 etc)
- In mass-volume correlation (e.g., 0,1-200 ml, 50,0-500 ml etc.)

Solutions for external application are lotions, solutions for washing, rinsing, syringing, bathing wounds and irrigation; their volume is *100-500 ml,* and are used as eye drops (should be sterile),, nasal drops, eardrops and dental - their volume is *5-10 ml.*

Solutions are written out in the reduced and complete forms.

The reduced way: the name of the medicinal form (*Sol.,* the name of the agent in the genitive case, the kind of solution, the concentration of solution (usually in %) and its quantity *in ml* or *grams. The water character* of solution is not indicated.

Prescribing oil or alcohol solutions after the name of the medicinal form *(Sol.)* and the name of the medicinal substance the solvent - **oleosae** or **spirituosae** should be indicated.

Solution for external use is a fluid officinal form, which is received during dissolution of solid or fluid medicinal substance in the solvent. The solutions are the aqueous, alcoholic, and oil. They are used for washing, irrigation, rinsing, fomentation in the treatment of wounds, ulcers, etc. They are prescribed as already prepared officinal forms:

Rp.: Solutionis Furacilini 0,02% 500 ml

D.S. For irrigation of wound

Also concentration can be expressed in form of ratio:

Rp.: Solutionis Furacilini 1:5000 - 500 ml
D.S. For irrigation of wound.

In cases of spirit or oil solutions we have to write word "spirituosae" "oleosae" correspondent after agent's name.

Rp.: Solutions Iodi spirituosae 5% 50 ml
D.S. For external application
#
Rp.: Solutionis Camphorae oleosae 10% 10 ml
D.S. For external using

Usually volume of prescribed solution for irrigation and rinsing of wounds cavities is about 500 ml, volume for local application is about 50-100 ml, and volume of eye or ear drops is about 10 ml.

Rp.: Solutionis Sulfacilum-natrii 30% 10 ml
D.S. Eye's drops. Drop 2 drops into each eye 4 times a day.

Solution for injection is a liquid officinal form that is formed by dissolving of one or more active substances and is intended for injection using. In generally, solution 1 is the incorporation of a solid, a liquid, or a gas in a liquid resulting in a homogeneous single phase.

The solvents are water, spirit, or vegetable oils. Solution for injection differs from tincture, extract with higher degree of purity, sterility, and absence of ballast substances. Also, solution for injection have such advantages as: the higher therapeutic activity, quick onset of action, more exact dosage, portability, possibility of their administration to unconsciousness patients.

Physician begins prescription from the word **solution, sol.** (in genitives case - **solutionis**; in nominative case - **solutio**) and agent's name. Than it must be present concentration of the solution (in percentage) and volume of one ampoule or bottle. In the next line we have to write **Da tales doses, D. t. d.**, give such doses; amount of ampoules or bottles. Solutions for injections are produced in ampoules (*ampullis)* with, 1, 2, 5, 10, 20 ml capacity or bottles with 5, 10, 50, 200, 400 ml capacity. If it is ampoules, we have to note after figure **in ampullis, in ampull**. In case of bottle we don't write anything after amount.

Rp.: Solutionis Platyphyllini hydrotartratis 0,2% 1 ml
Da tales doses N. 10 in ampullis

S. Inject 1 ml 2 times per day subcutaneously

If solvent is spirit or vegetable oil, it must be noted spirituosae or oleosae correspondently after agent's name. For aqueous solutions the solvent isn't indicated

Rp.: Solutionis Camphorae oleosae 20% 2 ml
D. t. d. N. 10 in ampullis
S. Inject subcutaneously 2 ml once daily.
#
Rp.: Solutionis Gramicidini spirituosae 2% 5 ml
D. t. d. N. 10 in ampull.
S. To dissolve the ampoule's content in 500 ml of sterile water before use. For external use only.

Patented form of solution is prescribed without word "solution". For instance, 0,15% solution of cytisinum is known as "cytitonum". As the rule, we can't write word solution when concentration is absent. This agent can be prescribed in both ways.

Rp.: Solutionis Cytisini 0,15% 1 ml
D. t. d. N. 10 in ampull.
S. Inject intravenously 1 ml
#
Rp.: Cytitoni 1 ml
D. t. d. N. 10 in ampull.
S. Inject intravenously 1 ml
#
Rp.: Rheopolyglucini 400 ml
D. t. d. N. 2
S. Intravenous infusion dropply

Also we don't write word "solution" for hormones prescription.

Rp.: Pituitrini 1 ml (5 UA)
D. t. d. N. 6 in ampull.
S. Inject 1 ml subcutaneous per day
#
Rp.: Insulini 5 ml (1 ml – 40 UA)
D. t. d. N. 2
S. 20 units SC 30min before meals.

As it is mentioned beyond, when the substance is produced in bottle, the word "bottle" isn't written.

Sometimes we prescribe big bottles, which contain many units of doses of injection solution. In addition, when bottles are produced in the laboratory of hospital or drug-store, we have to write instruction for its purity - Sterilizetur, sterilize.

Rp.: Solutionis Glucosi 5% 400 ml
Sterilizetur!
D.S. For subcutaneous injection.

Agent in bottle can be produced in dry form. As the rule, it is dissolved before using. In signature it have to be marked. The prescription is looked so:

Rp.: Streptomycini sulfatis 1,0
D. t. d. N. 6
S. Dissolve the contents of bottle in 5ml of 0,25% Novocain solution. To inject intramuscularly 2,5 ml per 12 hours.

Sometimes the substance is dosed in internal (biological) units and produced in bottles:

Rp.: Bicillini-3 600000 UA
D. t. d. N. 5
S. Inject intramuscularly once a week,
preliminary dissolving the bottle content
in 3 ml of water for injections.

3. Infusions and decoctions (Infusa et Decocta) are liquid medicinal forms, representing the water extractions from plant raw material. They are made by soaking vegetation with medicinal properties in water to withdraw the specific desired substances.

Infusions and decoctions are made in the pharmacy directly before giving to a patient.

They decompose rapidly and that is why they are prescribed for 3-4 days.

Infusions are made from the biologically active substances, which may come from different parts of the plant (leaves, flowers, grasses) and are easily extracted.

Decoctions are made from the dense parts of the plants, usually from the bark, roots, or sometimes from leaves.

Infusions and decoctions are prescribed only in a short form with the indication of the amount of the medicinal raw material and the total amount of the infusions or decoctions.

After the name of the medicinal form in Latin - *Infusi* or *Decocti* it is needed to indicate the part of the plant, which has been used to prepare solution (leaves, bark etc), then the name of the plant, the amount of the medicinal raw material in grams and the total amount of the infusion or decoction to be given.

Between the amount of the plant raw material in grams and the total amount of the infusion or decoction you have to put a dash.

Cordials are transparent liquid forms containing alcohol (some of them are colored).

They are produced by soaking plants in alcohol without heating to extract the medicinal substances or they may be made by dissolving extracts.

Concentrations of all cordials are strictly defined by **State Pharmaceutical Book.**

In prescribing cordials, it is not necessary to indicate the part of the plant or the concentration of the cordial *(T-rae Valerianae* 25 ml). They are dosed in drops, the amount of the prescribed cordial is 5-30 ml.

Complex cordials contain more than one active substance.

1 ml of cordial contains 40-50 drops if it was made in 70% ethyl alcohol.

Extracts are concentrated substances, which are produced from plants with medicinal properties.

They are dissolved directly before using. There are 3 types of extracts:

- Liquid -*fluidum*
- Thick - *spissum*
- Dry - *siccum*

The dry extracts are produced by drying of thick extracts. Thick and dry extracts have a higher percentage of active substances than liquid extracts.

Infusion (Inf., in genitive cases - **Infusi)** is a liquid form that contains water extract from the plants It is produced by steeping of plant origin (leaves - **folium, *pl.* folia,** in genitive case - *sing.,* **folii, *pl.* foliorum;** grass - **herba,** in genitive case -**herbae)** in water and boiling 15 minutes. **Decoction (Dec.,** in genitive case - **Decocti)** is close to infusion. However, decoction is prepared from more crude and rough plant origin, e.g., roots - **radix,** in genitive case - **radicis,** bark - **cortex,** in genitive case - **corticis.** That's why decoction boiling is longer (about 20-30 minutes) than infusion.

Infusion and decoction are prescribed in a division way. It's mean that patient obtain bottle with total dose. Than patient himself select moment dose by different spoonfuls. They are small teaspoonful (for children below 5 years), teaspoonful (from 6 years till 16 years), and tablespoonful (over 17 years).

1 small teaspoonful contains 5 ml

1 teaspoonful contains 10 ml

1 tablespoonful contains 15 ml

Both infusion and decoction are unstable; they loose therapeutic action in a ft days. Thus, traditionally they are prescribed for twelve times taking. For prescription of infusion and decoction we have to multiple moment dose of plant origin into (amount of its taking), and we'll get the total weight of plant source.

The water volume for infusion and decoction is to be found out as follows:

Spoon volume	*	Quantity of intake	=	Total volume
5 ml	*	12	=	60 ml (for children till 5 years)
10ml	*	12	=	120 ml (for children from 6 till 16 years)
15 ml	*	12	=	180 ml (patients over 17 years)

For example, prescribe infusion of grass of Adonis vernalis, which moment dos (MD) is 0,5 (5 decigram). Take 1 tablespoonful three times per day.

First of all we have to calculate total weight of grass and total volume of added water.

Total weight of grass: 0,5 * 12 = 6,0

Total volume of water: 15 ml * 12 = 180 ml

Thus,

Rp.: Infusi herbae Adonidis vemalis 6,0 -180 ml
D.S. Take 1 tablespoonful 3 times per day.

Prescription of decoction is similar. For example, prescribe decoction of bark of Frangula, which moment dose is 1,5. Take 1 tablespoonful before sleep.

Rp.: Decocti corticis Frangulae 18,0 -180 ml
D.S. Take 1 tablespoonful before sleep.

Mixture (Mixtura, in genitive case - **Mixturae)** is a liquid medicine that consists of various agents. Water is a liquid solvent that give form to mixture. If mixture contains decoction or infusion, water can be present in their composition. In opposite case, water have to be added separately; it is mentioned **Aqua destillata (Aq. destill.,** in genitive case - **Aquae destillatae)** on the last line of agent's list. Mixture as well as infusion and decoction are given by spoonfuls, teaspoonfuls, and small teaspoonfuls. Also, mixture is prescribed for twelve intakes and in a division way. All substances in mixture have to be mixed. That's why we write **Misce (M.),** mix after me list of active agents.

For example, prescribe mixture that contains potassium *(kalium)* and sodium *(natrium)* bromide, moment dose 0,3 each for adult. Take 1 tablespoonful 3 times perday.

Rp.: Natrii bromidi
Kalii bromidi ana 3,6
Aquae purificatae 180 ml

M.D.S. Take 1 tablespoonful 3 times per day

Mixture that includes infusions has the next structure. Prescribe mixture that include infusion of leaves of Digitalis, moment dose - 0,05; and themisalum, moment dose – 0,3. Take 1 tablespoonful 3 times per day.

Rp.: Infusi foliorurn Digitalis 0,6 -180 ml
Themisali 3,6
M.D.S. Take 1 tablespoonful 3 times per day.

Syrup (Syrupus, in genitive case - **Sympi)** is a highly concentrated aqueous solution of a sugar; e.g., sugar syrup **(Syrupus simplex).** That's why it improves mixture test and prevents bacterial growth. Volume of syrup approximately is 20-30% of total mixture volume.

Drops for enteral usage are liquid medicines. Water, spirit, and vegetable oils are used as solvents. As usually total volume of drops is 10-30 ml. It is known that *1 ml of spirit solution contains 50 drops* and *1ml of water solution contains 20 drops.* For example, prescribe atropine sulfate (Atropini sulfas), moment dose - 0,001. Prescribe 20 drops (1 ml) two times per day during 10 days.

Quantity of intakes = quantity of usage during 1 day * duration of treatment; 2*10=20. Total weight of atropine = moment dose * quantity of intakes; 0,001*20*0,02 (gram). If it does not mentioned "spirit" or "oil" solution, it is water solution. Moment dose of water is 20 drops or 1ml. Total volume of water = volume of moment dose * quantity of intakes; 1ml*20=20ml.

Rp.: Atropirri sulfatis 0,02
Aquae purificatae 20 ml
M.D.S. Take 20 drops 2 times per day

More often drops for inner use are prescribed in shortened form. In this case we begin prescription from characteristic of medicinal form - word "solutionis"; than it must be written name of agent, concentration (in per cent, %) and total volume of solution. In general, expression "1% solution" is meaning that 100ml of this solution contains 1 gram of active substance. That's why, percentage of the solution is a quantity of active substance (in gram) in 100ml of solution. It can be calculated with *e help of ratio. For example, we know that it is 0,02 (gram) of atropine sulfate in 20 ml of solution. Ratio will be the next:

In 20 ml of solution - 0,02 of atropine sulfate
In 100 ml of solution- X of atropine sulfate
X =0,02*100/20 = 0,01

Thus, it will be 0,01 (gram) of atropine sulfate in 100ml of solution; concentration of solutions 0,01%.

Rp.: Soiutionis Atropini sulfatis 0,1% 20 ml
D.S. Take 20 drops 2 times per day

If solvent is spirit or vegetable oil, it must be noted **spirituosae** or **oleosae** correspondently after agent's name.

Rp.: Solutionis Nitroglycerini spirituosae 1% 10 ml
D.S. Take 2 drops on peace of sugar under the tongue

Tincture (Tinctara, T-ra; in genitive case - **Tincturae, T-rae)** - is an alcoholic, hydroalcoholic, or ether-alcoholic extraction of raw plant material. Medical dosage is 20 - 25 drops of tincture for one time.

Infusion and tincture are extracts from the plant origin. However, **infusion** is a water extract, tincture is a alcohol extract. Also, tincture is more stable (during a few years) than infusion.

Rule of tincture writing is: drop's quantity for one intake must be the same as the total volume of tincture in milliliters:

Rp.: Tincturae Valerianae 25 ml
D.S. Take 25 drops three times per day

Simple tincture is an alcohol extract from one plant origin Complex tincture is composition of two or more tinctures. For instance, prescribe composition of tincture of Valeriana and tincture of Convallaria in equal volume with addition of tincture of Crataegus, volume of which is ¼ of total composition volume. Administer 20 drops 3 times per day.

First of all, if we need to prescribe 20 drops for one intake, the total volume of composition is 20 ml. Than, ¼ of total composition volume (20 ml) will be 5 ml. So, the sum volume of tinctures of Valeriana and Convallaria is 15 ml. As it mentioned above, tincture of Valeriana and tincture of Convallaria have equal volume. Thus, volume of both tinctures is 7,5 ml.

Rp.: Tincturae Valerianae
Tincturae Convallaria ana 7,5 ml
Tincturae Crataegi 5 ml
M.D.S. Take 20 drops 3 times per day

If tincture-including mixture consists of many ingredients, it is prescribed as a patented officinal form. For example, "Corvalolum" includes valerianic acid, phenobarbital, peppermint oil, alcohol, and water.

Rp.: Corvaloli 15 ml

D.S. Take 15 drops in the evening

Extract (Extractum, Extr., in genitive case - Extracti) is a concentrated preparation obtained from the plant origin by removing of the constituents with suitable solvents. According to it aggregate condition, extract can be **dry (siccum)**, thick **(spissum)**, and **liquid (fluidum)**. Dry extract has less than 5% of moister; thick extract has 5-25% of moister; and liquid extract has over 25% of moister.

Thick and dry extracts are dosed out in the weight units (gram) and are prescribed in capsules, powders, tablets, and suppositories.

Liquid extract is dosed out in drops and is prescribed in the same way as a tincture. It means that the total volume in milliliters must be the same as the quantity of drops for one intake. Also we have to mark that it is liquid (fluidum) extract.

Rp.: Extracti Polygoni hydropyperis fluidi 25 ml

D.S. Take 25 drops 4 times a day

4. Novo-galenic medicines consist of specific processed plant raw materials. They may be water, water-alcohol, alcohol-chlorophormic and other extractions from plants raw materials. They differ from *galenic preparations* by higher degree of purification from ballast substances and existence of higher degree of pharmacological activity. They are almost free from inert substances and contain the sum of the biologically active ingredients of the plants. They are administered not only internally, but also parenterally.

New-galenic preparations are officinal.

Mucuses are liquid medicinal forms for internal and external use and are high-molecular viscid solutions. They are made by dissolving the mucus substances of the plant origin (starch) or by extracting them by infusion.

The most often used viscid resins are apricot (Mucilago Gummi Armeniacae), arabian (Mucilago radicis Altheaeae), and starch (Mucilago Amyli).

Prescribing mucuses the name of the mucus and the amount should be indicated.

Mucuses are used as a covering for substances with irritating properties.

Emulses are liquid medicinal forms. Non-dissolved oils are suspended as fine drops in a water environment. There are 2 types of emulses:

1. Oil (Emulsa oleosa)
2. Seed (Emulsa seminalia)

An emulgator is a substance, which causes fat oil drops to be divided and become smaller droplets. Gelatin is one of the existing emulgators. For good emulgating take 2 parts of oil, 1 part of emulgator and 17 parts of water (2:1:17).

Suspensions are liquid medicinal forms in which the fine non-liquid non-dissolved medicinal substances are mixed in a prescribed liquid. They are used internally, externally, and parenterally.

Suspension (Suspensio, Susp., in genitive case - **Suspensionis**) is a class of preparations of finely divided, undissolved drugs (e.g., powders for suspension) dispersed in liquid for oral or parenteral use. We prescribe them so as solutions.

Rp.: Suspensionis Hydrocortisoni acetatis 2,5 % 5 ml
D. t. d. N. 6
S. Inject 1,5 ml into the cavity of injured
joint 1 time per week.

#

Rp.: Suspensionis Chlorthiazidi 5% 250 ml
D.S. Take orally 10 ml (teaspoonful) twice a day

Emulsions are liquid medicinal forms in which lipidic non-dissolved medicinal substances are mixed in a prescribed liquid (water). They are used internally and externally.

There are two types of emulsions: seed (semen Amygdali dulcis, semen Papaveris, semen Cucurbite) and oil (oleum Amygdalarum, oleum Persicorum, oleum Ricini).

Seed emulsion:

Rp.: Sem. Amygdali dulcis 20,0
Aq. pur. ad 200 ml
M. f. emuls.
D.S. Take orally one tablespoonful 3 times a day.

Rp.: Emuls. sem. Amygdali dulcis ex 20,0 – 200 ml
D.S. Take orally one tablespoonful 3 times a day.

Oil emulsion:

Rp.: Ol. Ricini 20,0
Gelatosae 10,0
Aq. pur. 170 ml
M. f. emuls.
D.S. Take orally one tablespoonful 3 times a day.

Rp.: Emuls. ol. Ricini ex 20,0 – 200 ml
D.S. Take orally one tablespoonful 3 times a day.

5. Syrups, balsams, elixirs, juices, fragrant waters, shampoons concern to other liquid medicinal forms.

General questions:

1. General characteristics of solutions. Solutions for external and internal use. Officinal solutions.
2. Dissolvents. Different ways of indication of solution concentrations.
3. Types of solution prescription: spread and short ones.
4. Drug forms for injections, requirements to them. Prescription of drugs for injections in ampoules and vials.
5. The peculiarities of drugs prescription for injections.
6. Particularities and characteristics of eye pellicles. The rules of prescription.
7. Therapeutic value of tinctures and extracts, the rules of prescription.
8. Means of preparing, therapeutic value of infusions and decoctions. The rules of prescription.
9. The kinds of emulsions. Positive and negative effects. Therapeutic uses.
10. The kinds of mixtures, their therapeutic uses and the rules of prescription.
11. Syrups, balsams, medical oils, aerosols and other medicinal forms.

Home task on prescription:

Prescribe in spread and short form:

1. 500ml topical solution of 0,1% Aethacridinum lactas for treatment of wound surface.
2. 20ml of 1% spirituous solution of Viridae nitens for applying to the affected areas of the skin.
3. Solution of 1% Pilocarpini hydrochloridi for instillation in the lower conjunctival sac (2 drops every 6 hours).
4. 10% Calcii gluconas in ampoules (10 ml for i/m injections a day within 10 days).
5. Solution of 25% Aminasinum in ampoules: 1ml (o.d. 25 mg) for i/m injections a day within 10 days.
6. 25ml of Absinthii tincture for taking orally (20 drops before meal 3 times a day).
7. 25ml of liquid extract of Viburni for taking orally (25 drops before meal 3 times a day).
8. 180ml infusion of Thermopsidis herb (o.d. 0.05g) for taking orally (1 tablespoonful 3 times a day).

9. Mixture of infusion of folii Digitalis (o.d. 0.1g) to take orally 1 tablespoonful 3 times a day for 4 days.
10. Mixture of decoction of Althaeae radix (o.d. 0.3g), Natrii hydrocarbonase (o.d. 0.1g) and Simplex syrup to take 1 dessertspoonful 3 times a day orally.
11. 20ml of emulsion of castor oil (Oleum Ricini) for taking orally (1 tablespoonful once a day).

Educational research work

Assignment 1

Prescribe in spread and short form:

1. Topical solution of Furacilinum 0,02% - 500ml for irrigation of the wound surface.
2. 10ml of eye drops of 30% Sulfacylum natrium to instil into the lower conjuctival sac (2 drops 3 times a day).
3. 5 ml of 1% spirituous solution of Nitroglycerinum. To introduce sublingually (1-2 drop on the piece of sugar).
4. Solution of Calcii chloridum (o.d. 0,5g) to take 1 tablespoonful 3 times a day after meal orally.
5. 0.01% solution of Diazepamum in 2ml ampoules for i/m injection twice a day.
6. 2,5% solution of Thiamini chloridum in 1ml ampoules for i/m injection once a day.
7. Solution of Atropini sulfas (o.d. 0,001g) to take 20 drops 3 times a day orally for 10 days.
8. Liquid extract of Polygonii hydropiperis to take 25 drops 3 times a day orally.
9. Tincture of Convallariae and Valerianae to take 10 drops at once orally.
10. Mixture of infusion of Adonidis vernalis herb (o.d. 0,5g), Codeinum phosphas (o.d. 0,015g) and Natrii bromidum (o.d. 0,5g) to take orally (1 tablespoonful 3 times a day).
11. Mixture of decoction of rhubarb Radix Rhei 1:30 and 30g Natrii sulfas to take 1 tablespoonful 3 times a day orally within 4 days.
12. Emulsion of 10g of flax seeds (Semina Lini) to take 3 times a day orally.
13. Emulsion of 20g of oil (Oleum Lini) to take 1 tablespoonful once a day orally.
14. Aerosol “Atrovent” for inspiration twice a day.

Assignment 2. Prescribe the dissolvents of solutions for external and internal use in your workbook.

Assignment 3. *Prescribe the syrups and slimes for mixtures, oils, seeds and emulgators for emulses in your workbook.*

P. W. 5.

Theme:

Agents affecting the afferent nervous system. Local anesthetics. Astringents, absorbents, covering and irritating agents.

General questions:

1. Agents affecting the peripheral nervous system. Classification (drugs decreasing and stimulating sensitivity of afferent nervous endings).
2. The conception of the term "anesthesia", its types.
3. Local anesthetics. Classification, mechanism of action. The most important requirements to anesthetics.
4. Clinical use of local anesthetics (doses and concentrations for different types of anesthesia.
5. Adverse effects, methods of their prevention and treatment. Acute poisoning with local anesthetics, its treatment.
6. The principles and mechanism of action of organic and inorganic astringent drugs. Therapeutic use.
7. Covering agents. The mechanism of action and therapeutic uses.
8. Absorbing agents. Classification. The mechanism of action and therapeutic uses.
9. Irritating agents. The mechanism of action and therapeutic uses.

Classification of agents affecting the afferent nerve endings

I. *Agents of depressing type of action:*

1. Local anesthetics:
   - A. Drugs for terminal (superficial) anesthesia:
     - Anesthesinum
     - Dicainum
   - B. Drugs for infiltration, conduction and spinal (subarachnoid) anesthesia:
     - Novocainum
     - Lidocainum
     - Trimecainum
     - Ultracainum
   - C. Drugs for all types of anesthesia: Lidocainum.

2. Astringents. Classification:
   - A. Organic:
     - Tanninum

- Tannalbinum
- Oak bark (Cortex Quercus)
- Wort (Herba Hyperici)
- Leaves of Salvia (Folium Salvia)
- Flowers of Matricaria chamomilla (Flores Chamomillae Recutitatae)

B. Inorganic:
- Bismuthi subnitras
- Bismuthi subcitratum (De-nol)

3. Covering agents:
   1. Mucus of starch (Mucilago Amyli)
   - Mucus of seeds of flax (Mucilago seminis Lini).
4. Absorbents:
   - Activated charcoal (Carbo activatus)
   - Enterosgelum

II. *Agents of stimulating type of action:*

1. Irritating agents:
   - Solution of Ammonia (Sol. Ammonii caustici)
   - Turpentine oil refined (Ol. Terebinthinae rectificatum)
   - Mustard peper (Sinapismus-saccinus)
   - Mustard plaster
   - Mentholum

Home task on prescription:

Prescribe:

1. Rectal suppositories containing Anesthesinum.
2. Trimecainum for intraspinal anesthesia.
3. Solution of Lidocainum in ampoules.
4. Solution of Tanninum for external use.
5. Tablets of activated charcoal.
6. Solution of Ammonii caustici in ampoules.
7. Infusion of flowers of a Matricaria chamomilla.

CASE STUDY

A college athlete is scheduled to undergo open repair of two fractured fingers. She is otherwise healthy, takes no medications, and has no family history of difficulties with anesthesia. The anesthetic management is to be brachial plexus anesthesia with *bupivacaine*. During injection of the anesthetic, the patient abruptly becomes uncommunicative and loses consciousness. The ECG deteriorates rapidly, and no AP is obtainable. The trachea is intubated,

cardiopulmonary resuscitation is started and advanced life support follows. Despite aggressive treatment, the resuscitation is unsuccessful. What is a possible reason for this outcome in light of the type of anesthesia being used?

Educational research work.

Assignment 1.

Prescribe:

1. Novocainum for infiltrational anesthesia.
2. Ultracainum in ampoules.
3. Aspersion and ointment of Anesthesinum.
4. Solution of Tanninum for internal use.
5. Enterosgelum.

Assignment 2.

Pharmaco-therapeutic task.

1. Drugs for temporary (surface) anesthesia.
2. Drugs for infiltration anesthesia.
3. Drugs for conduction anesthesia.
4. Drugs for spinal (subarachnoid) anesthesia.
5. Drugs, used in stomatology.
6. An astringent drug, used for burns, ulcers, cracks, decubital ulcers.
7. An adsorbent, used for poisonings, meteorism.
8. An agent, used for inspiration in syncope.
9. Astringents of vegetable origin.
10. A local anesthetic drug for all types of anesthesia.

Assignment 3.

Individual work: fill in the table.

Drugs	Dosage form	Indication to use
1. Local anesthetics: Example: Novocainum	Amp. 0,25%-0,5%, 1%, 2%, 1, 2, 5, 10ml,vial-0,5%-200; 400ml. Ointment 5%, 10%. Rectal suppositories-0,1g	For infiltration anesthesia.
2. Astringents:		
3. Covering agents:		
4. Absorbents:		
5. Irritating agents:		

Assignment 4.

*Choose **one** correct answer:*

1. What is the mechanism of action of covering drugs?
A. Blockade of receptors of mucous membrane.
B. Coagulation of proteins of superficial layer of mucous membrane.
C. Binding to toxic substance with complexes formation.
D. Creation of protective layer on mucous membranes.
E. Stimulation of regenerative processes.

2. Indicate the mechanism of action of local anesthetics.
A. Block sodium channels.
B. Create albuminates with plasma proteins.
C. Block M-cholinoreceptors.
D. Block N-cholinoreceptors.
E. Block alpha-adrenoreceptors.

3. What is the main indication for absorbing drugs use?
A. Diarrhea.
B. Hypoacidic gastritis.
C. Decrease in trypsin activity.
D. Decrease in bile secretion.
E. Intoxication.

4. Why Novocainum (Procainum) is not used for terminal anesthesia?
A. Do not exert covering effect.
B. Is not soluble in the lipids, that's why poorly penetrates through the unaffected skin and mucous membranes.
C. Is absorbed fast and inhibits the CNS.
D. Irritates mucous membranes.
E. Activates M-cholinoreceptors.

5. What is the mechanism of antiinflammatory action of astringent drugs?
A. Blockade of receptors of mucous membrane.
B. Formation albumin film which decreases irritation of receptors.
C. Binding to toxic substance with complexes formation.
D. Blockade prostaglandin synthase.
E. Stimulation of regenerative processes.

6. What drug from the group of local anesthetics is not used together with sulfonamides?

A. Lidocainum.
B. Trimecainum.
C. Novocainum (Procainum).
D. Ultracainum.
E. Anaesthesinum.

7. A 23-year-old woman with red and itchy eczematous dermatitis visited a doctor office. She had a dental procedure 1 day earlier with administration of a local anesthetic. There were no other findings, although she indicated that she had a history of allergic reactions. Which of the following drugs is most likely involved?
A. Lidocainum.
B. Ultracainum.
C. Anaesthesinum.
D. Novocainum.
E. Trimecainum.

8. A patient was delivered to the ophthalmologic department in connection with trauma of the eye as a result of hitting of metallic shaving. Edema of the eye, significant hyperemia, hyperlacrimation, pain are observed. Choose the local anesthetic to use for removal of the foreign body.
A. Novocainum.
B. Trimecainum.
C. Anaesthesinum.
D. Dicainum.
E. Lidocainum.

9. This agent is poorly soluble in water, so it is used for superficial anesthesia only in the form of ointment paste and powder. What is this drug?
A. Lidocainum
B. Sovcainum.
C. Novocainum.
D. Trimecainum.
E. Anaesthesinum.

10. Determine the drug which is used for all types of anesthesia?
A. Novocainum (Procainum)
B. Anaesthesinum.
C. Lidocainum.
D. Trimecainum.
E. Dicainum

11. A patient with eye injury and high sensitivity to sulphonamids claimed to ophthalmologic department. Which of the following anesthetics should be used to relieve the pain of conjunctive?
A. Lidocainum
B. Anaesthesinum
C. Dicainum
D. Novocainum
E. Trimecainum

12. A patient should use local anesthetic for treatment of felon. The doctor prescribed the drug of replaced amides group – acetanilide derivative. Which drug was prescribed to the patient?
A. Anaesthesinum
B. Ultracainum
C. Lidocainum
D. Novocainum
E. Trimecainum

13. A patient with shoulder soft tissues inflammation was prescribed lidocainum for relieving the pain. What pharmacological group this drug belongs to?
A. Esters of benzoic acid
B. Esters of paraaminobenzolum acid
C. Esters of benzolichoninum
D. Esters of benzophurancarbonatum acid
E. Replaced amids

14. Subarohnoidalum anesthesia was used for relieving the pain during childbirth. What anesthetic should be used for this type of local anesthesia?
A. Promedolum
B. Analginum
C. Lidocainum
D. Mentholum
E. Anaesthesinum

15. Consult the physician which of the drugs has antiarrhythmic action and belongs to the group of local anesthetics.
A. Lidocainum
B. Digoxinum
C. Metoprololumum
D. Anaprilinum
E. Magnesii sulfas

16. After myocardial infarction a patient was suffered from ventricle arrhythmia. Heart rate became normal after injection of antiarrhythmic agent which had local anesthetic activity. What drug was injected?
A. Novocainamidum
B. Lidocainum
C. Verapamilum
D. Pananginum
E. Propranololumum

17. In traumatic department a patient was administered the drug from replaced amides group for conductive anesthesia. Name this drug.
A. Novocainum
B. Anaesthesinum
C. Promedolum
D. Tanninum
E. Lidocainum

Assignment 5.
*Choose **all** correct answers:*

1. Agents with stimulating type of action:
1. Irritating agents
2. Expectorant drugs
3. Adsorbents
4. Laxative drugs
5. Local anesthetics
6. Astringents

2. Local anesthetics - substituted amide of acetanilide:
1. Lidocainum
2. Trimecainum
3. Novocainum
4. Ultracainum
5. Anaesthesinum
6. Mentholum

3. Novocainum is used for:
1. Infiltrational anesthesia
2. Conduction anesthesia
3. Terminal (superficial) anesthesia
4. Treatment of hypertension crisis

5. Stimulation of stomach glands
6. Treatment poisoning of opioid analgesics

4. The drug, which is used as an antiarrhythmic in cardiology:
1. Tanninum
2. Novocainum
3. Lidocainum
4. Anaesthesinum
5. Mentholum
6. Bismuthi subnitras

5. Inorganic astringents are:
1. Bismuthi subnitras
2. Zinci oxydum
3. Zinci sulfas
4. Tanninum
5. Argenthi nitras
6. Carbo activatus

6. Bismuthi subnitras is used for treatment of:
1. Inflammation of skin and mucous membranes
2. Inflammatory disorders of digestive channel
3. Ulcer of stomach
4. Myocardium infarction
5. Alcoholic intoxication
6. Myocardium infarction

7. Mustard paper (Sinapismus-saccinus) are used for treatment of:
1. Hypertension crisis
2. Inflammation of respiratory organs
3. Stenocardia
4. Neuralgia
5. Ulcer of stomach
6. Burns

8. Indications for Mentholum are:
1. Inflammation of respiratory organs
2. Stenocardia
3. Neuralgia
4. Myalgia
5. Ulcer of stomach
6. Burns

9. Sol. Ammonii caustici reflectory stimulates:
1. Centre of breath
2. Centre of satiation
3. Vasomotor centre
4. Centre n. vagus
5. Centers of hypothalamus
6. Gastric secretion

10. Astringents are:
1. Tanninum
2. Sol. Ammonii caustici
3. Decoctum cort. Quercus
4. Infusum fol. Salviae
5. Infusum flor. Chamomillae
6. Mentholum

11. Agents with inhibitory (suppressive) type of action:
1. Local anesthetics
2. Astringents
3. Emetic drugs
4. Covering drugs
5. Cholagogue drugs
6. Adsorbents

12. Local anesthetics – ethers of paraaminobenzoic acid are:
1. Novocainum
2. Anaesthesinum
3. Sol. Ammonii caustici
4. Dicainum
5. Lidocainum
6. Mentholum

13. Anaesthesinum is used in form of:
1. Aspersion
2. Paste
3. Extract
4. Powder
5. Tablets
6. Suppositories

14. Novocainum is incompatible with:

1. Sulfonamides
2. Antibiotics
3. Antianginal drugs
4. Astringents
5. Irritating agents
6. Cholinoblockers

15. Astringents are:
1. Tanninum
2. Decoctum cort. Quercus
3. Infusum fol. Salviae
4. Mentholum
5. Atropini sulfas
6. Anaesthesinum

16. Tanninum is used for:
1. Treatment of burns
2. Mouth wash
3. Gastric lavage
4. Augmentation of labor
5. Antitussive drug
6. Treatment of alcoholism

17. Ol. Terebinthinae rectificatum is used for treatment of:
1. Neuralgia
2. Myalgia
3. Rheumatic pain
4. Otitus
5. Adnexitis
6. Cough

18. Mentholum changes tonus of vessels:
1. Dilates surface vessels of mucous membranes
2. Constricts coronary vessels
3. Constricts surface vessels of mucous membranes
4. Constricts coronary vessels
5. Doesn’t change
6. Constricts vessels

19. Sol. Ammonii caustici is used in:
1. Syncope
2. Alcoholic intoxication

3. Respiratory arrest
4. Asthenia
5. Myalgia
6. Glaucoma

20. Irritating drugs are:
1. Ol. Terebinthinae rectificatum
2. Mentholum
3. Sol. Ammonii caustici
4. Mustard peper (Sinapismus-saccinus)
5. Novocainum
6. Tanninum

21. Which of the following drugs act reflexively?
1. Dicainum
2. Carbo activatus
3. Mentholum
4. Bolus Alba
5. Solutio Ammonii caustici
6. Anaesthesinum

22. For the local infiltration anesthesia are employed:
1. Cocainum
2. Anaesthesinum (Benzocain)
3. Lidocaini hydrochloridum (Xycain)
4. Dicainum
5. Novocainum (Procaine)
6. Trimecainum

23. Choose drugs, systemic action of which has therapeutic application:
1. Dicainum
2. Cocainum
3. Novocainum (Procaine)
4. Tanninum
5. Xycain (Lidocainum)
6. Anaesthesinum (Benzocain)

24. Choose pharmacological effects of novocainum (procainum):
1. depression of the central nervous system
2. ganglion blocking action
3. coating action
4. tanning action

5. anesthetic effect
6. a decrease of the intraocular pressure

25. Which is the listed drugs are administered intravenously?
1. Dicainum
2. Cocainum
3. Lidocainum (Xycain)
4. Tanninum
5. Novocainum (Procaine)
6. Anaesthesinum (Benzocain)

26. Which of the following drugs exhibit antiarrhythmic action?
1. Cocainum
2. Dicainum
3. Lidocainum (Xycain)
4. Tanninum
5. Novocainum (Procaine)
6. Anaesthesinum (Benzocain)

27. In the case of thermal burn (scald) of the oral cavity we shell use topically:
1. solution of tannin
2. Carbo activatus
3. Decoctum corticis Quercus
4. Solutio Ammonii caustici
5. Lidocaine (Xycain) solution
6. oil solution of menthol

28. Choose local anesthetics' mechanism of action:
1. penetration of the neurons nuclei
2. interference with protein synthesis in ribosome
3. penetration of the nerve fibers' membranes
4. interaction with specific receptors of the ion canals
5. depressive action on the pain centers in the brain

29. Novocainum exhibits such effects on the cardiovascular system as:
1. hypotension
2. hypertension
3. vasoconstriction
4. no effect
5. depression of excitability and automaticity

30. Mechanism of action of the local anesthetics is based on:

1. depression of the nerve endings sensitivity
2. interference with neurons' membranes permeability for ions
3. blockage of the choline receptors
4. interaction with protein molecules of the sodium canals
5. depression of the pain centers

31. Mentholum can be used:
1. in the case of upper air passages inflammation
2. as a tanning agent
3. removing of the warts (verruca, verruga)
4. for local infiltration anesthesia
5. for reflexive coronary dilatation

32. Application of the astringent agents causes:
1. alleviation of inflammation
2. absorption of the chemical compounds
3. profound systemic action
4. formation of the layer of coagulated proteins
5. irreversible protein coagulation involving all layers of the skin

33. Tanninum:
1. is used topically as an anti-inflammatory agent
2. in all cases it can be replaced with chloroform
3. it is an inorganic bismuth compound
4. it is used for gastric lavage in the case of heavy metal saline poisoning
5. due to its systemic action is used in the case of alkaline poisoning

34. In the case of hyperacid gastritis shall be used following drugs:
1. local anesthetics
2. coating agents
3. astringents
4. cholinomimetics
5. irritants

35. For spinal anesthesia are suitable:
1. Bupivacainum (Marcain)
2. Cocainum
3. Lidocainum (Xycain)
4. Tetracainum (Dicainum)

36. Tanninum can be used in the case of:
1. bronchitis

2. arterial hypertension
3. alkaline poisoning
4. meteorism (flatulence)
5. skin burns

37. Choose a drug suitable for all kinds of local anesthesia:
1. Novocainum (procaine)
2. Trimecainum
3. Lidocainum (Xycain)
4. Anaesthesinum (Benzocain)
5. Cocainum

38. Novocainum can cause a decrease in blood pressure because of:
1. blockage of the parasympathetic ganglia
2. blockage of the sympathetic nerves
3. depression of the cardiac performance
4. depression of the vasomotor center
5. respiratory depression

39. Drugs used only for topical anesthesia:
1. Articaine
2. Anaesthesinum (Benzocain)
3. Novocainum (procaine)
4. Lidocainum (xycain)
5. Trimecainum
6. Dicainum (Tetracainum)

40. Procainum for infiltrative anesthesia can be replaced with:
1. Anaesthesinum (Benzocain)
2. Lidocainum (Xycain)
3. Trimecainum
4. Tetracainum (Dicainum)
5. Cocainum

41. Which of the following compounds are inorganic astringent agents?
1. Tanninum
2. Tannalbinum
3. Preparations of the common St. John's wort (Hypericum)
4. Carbo activatus
5. Liquor Burovi
6. Argenti nitras
7. Plumbum aceticum

42. Heavy metal saline's mechanism of action includes:
1. reversible protein coagulation
2. sodium canals blockage
3. irreversible phospholipids' compaction
4. dehydration of the epithelium upper layer
5. interaction of the metal's cation with albumens
6. selective action on the certain proteins

43. In the site of inflammation procaine doesn't act because of:
1. it is charged and poorly soluble in the lipids
2. acidic medium (low pH)
3. disturbance of depolarization in the nerve fibers
4. disturbance of the blood supply
5. impossibility of the turning salt into basis

44. Mucilago Amyli can be prescribed in the case of:
1. chronic gastritis
2. in an enema to prevent irritation of the mucous membrane by drugs
3. in the case if gastric irritation
4. in the case of flatulence (meteorism)
5. to treat constipation

45. For conduction and infiltrative analgesia are used:
1. Cocainum
2. Tetracainum
3. Benzocain
4. Trimecainum
5. Procainum
6. Bupivacainum

46. Concerning Anaesthesinum (benzocainum) are true next statements:
1. it is used in pastes, ointments, powder
2. it is taken orally
3. it is insoluble in the water
4. it is used for infiltrative anesthesia
5. it is an analgesic
6. it is administered intravenously

47. Solutio Ammonii caustici
1. is called also Liquor Ammonii caustici
2. is an irritative drug

3. stimulates respiration reflectively
4. stimulates gag center
5. is contraindicated in the case of alcohol poisoning
6. depresses CNS

48. Mechanism of action of local anesthetics is characterized by:
1. interaction with adrenoreceptors
2. influence on the transmembrane ion transport
3. depressing of the pain centers of the brain
4. interferes with pain impulses conduction in the thalamus
5. blockage of the voltage-sensitive sodium channels

49. Which of the following drugs are local anesthetics?
1. Procainum
2. Lidocainum
3. Ketaminum
4. Cocainum
5. Phthorothanum
6. Tanninum
7. Bupivacainum

P. W. 6.
Theme:
Agents affecting the efferent nervous system.
M-, N- cholinomimetics. Anticholinesterase agents.
M-cholinomimetics and M-cholinoblockers

General questions:

1. Classification of drugs affecting the transmission of excitation in the cholinergic synapses.
2. The neurotransmitters role in the communication between extracellular events and chemical changes with the cell receptors and neurons.
3. Cholinoreceptors: muscarinic and nicotinic receptors. Localization, pharmacological effects of their stimulation and blockade.
4. M- and N-cholinomimetics: the mechanism of action, main effects and clinical uses.
5. Anticholinesterases. Classification, mechanism of action, pharmacological effects, clinical use, adverse effects. Treatment of poisonings, using of cholinesterase reactivators.
6. M-cholinomimetics: the mechanism of action, pharmacological effects, therapeutic use.
7. Acute poisoning with Pilocarpine. Clinical manifestation and treatment. Antidote therapy.
8. Pharmacodynamics of M-cholinoblockers, the mechanism of action, main effects, clinical use. Toxic action of Atropine, treatment of poisonings.

Classification of Cholinergic agents

I. M- and N-Cholinergic agents
   1. M-, N-cholinergic agonists (M, N-cholinomimetics).
      - Acetylcholinum
      - Carbacholinum
   2. M-, N-Cholinergic antagonists (M-, N-cholinoblockers)
      - Cyclodolum
      - Amyzylum
      - Spasmolytinum

II. Anticholinesterase agents:
   1. Anticholinesterase agents that reversibly inhibit acetylcholinesterase.
      - Proserinum (Neostigmin)
      - Galanthamini hydrochloridum

- Pyridostigmini bromidum

2. Anticholinesterase agents that irreversibly inhibit acetylcholinesterase.
   - Phosphacolum
   - Arminum
3. Reactivators of acetylcholinesterase:
   - Alloximum
   - Dipiroximum

III. M-cholinergic agents.

1. M-cholinergic agonists (M-cholinomimetics)
   - Pilocarpini hydrochloridum
   - Aceclidinum
2. M-cholinergic antagonists (M-cholinoblockers)
   - Atropini sulfas
   - Extractum Belladonnae siccum
   - Platyphyllini hydrotartras
   - Scopolamini hydrobromidum
   - Methacinum
   - Ipratropii bromidum (Atrovent)
   - Pirenzepinum (Gastrocepinum)

Home task on prescription:

Prescribe:

1. Carbacholinum in the form of eye drops.
2. Proserinum in tablets.
3. Dipiroximum in ampoules.
4. Aceclidinum in ampoules.
5. Phosphacolum for treatment of glaucoma.
6. Atropini sulfas in ampoules.
7. Methacinum in tablets.
8. Pilocarpini hydrochloridum in the form of eye drops.

Study Questions (repeat physiology of Autonomic Nervous System)

1. All of the following types of cells are innervated by the autonomic nervous system EXCEPT:

A. Smooth muscle of blood vessels
B. Skeletal muscle
C. Sinoatrial node
D. Salivary glands
E. Intestinal smooth muscle

2. All of the following structures have a significant cholinergic innervation EXCEPT:
A. Ventricular wall
B. Sinoatrial node
C. Atrioventricular node
D. Bladder
E. Ileum

3. The radial smooth muscle of the iris is innervated by:
A. Primarily sympathetic noradrenergic neurons
B. Primarily sympathetic cholinergic neurons
C. Primarily parasympathetic noradrenergic neurons
D. Primarily parasympathetic cholinergic neurons
E. Equally by sympathetic and parasympathetic neurons

4. The receptors on the skeletal muscle end plate respond to:
A. Acetylcholine and muscarine
B. Acetylcholine and nicotine
C. Acetylcholine, muscarine, and nicotine
D. Only muscarine of the three choices in C
E. Only nicotine of the three choices in C

CASE STUDY

1. A young woman named Pam has been brought to the emergency department. She is sweating profusely, vomiting, and having difficulty breathing. She cannot walk without assistance, and she has a pulse of 30. She is delirious and unable to explain her condition. The friend who brought her in said that the woman had threatened suicide 2 hours earlier with insecticide. What should you do?

2. A 55-year-old man who works in the furnace room at a steel foundry has developed chronic peptic ulcer disease that has not responded to treatment with antibiotics and H_2 receptor blockers. You are considering giving him an anti-muscarinic drug to block gastric acid secretion as adjunctive therapy. What are your concerns regarding the suitability of this treatment for this worker?

Educational research work

Assignment 1.

Prescribe:

1. Proserinum in ampoules.
2. Galanthamini hydrochloridum in ampoules.
3. Alloximum in ampoules.
4. Plathyphyllini hydrotartras in ampoules.

5. Pirenzepinum (Gastrocepin) in tablets.

Assignment 2.

Pharmaco-therapeutical assignment:

1. The agents, used for glaucoma treatment.
2. The agents, used in myasthenia gravis.
3. The drugs for treatment of the urinary bladder and intestine atony.
4. An agent for treatment of bronchial asthma.
5. The reactivators of acetylcholinesterase as antidote in organophosphate pesticide poisoning.
6. Spasmolytic agents for treatment of abdominal and liver colic.
7. An agent for the prevention and treatment of air sickness.
8. A drug, which selectively blocks the M1- cholinoreceptors of the stomach.
9. A drug which irreversibly inhibits acetylcholinesterase.
10. Galenic drug for treatment of liver colic.

Assignment 3.

Individual work: fill in the table.

Drugs	Dosage form	Indication to use
I. M- and N-cholinomimetics: Example: Carbocholinum. II. Anticholinesterase agents: III. M-cholinomimetics: IV. M-Cholinoblockers:	Vial 0,5%, 1%-- 5 and 10ml (eye drops)	For the treatment of glaucoma.

Assignment 4.

*Choose **one** correct answer:*

1. The doctor has been addressed by the man who has preliminary been surveyed by the oculist. Complaints of thirst, difficulty of swallowing, bad vision of close subjects. Objectively he demonstrates accelerated respiration, expanded pupils, general excitation, garrulity, however, obscure speech. Arterial pressure is 110/70, pulse is 110 per minute. Overdose of which preparation can specify the resulted symptoms?

A. Aminazinum
B. Morphini hydrochloridum
C. Ephedrini hydrochloridum
D. Atropini sulfas

E. Coffeinum- natrii benzoas

2. The neurologist has been addressed by the man of 25, with complaints of weakness in legs and infringement of gait. The doctor diagnosis myasthenia and prescribes the patient an injection of proserinum. What action is typical for this means?
A. Reversible blocking of acetylcholinesterase
B. Direct cholinomimethic action
C. Stimulation of metabolic processes
D. Ganglionblocking action
E. Activation of acethylcholine synthesis

3. The child poisoned with mushrooms, namely fly agarics, has been admitted to the toxicological department. What preparation should be used for granting the urgent help first of all?
A. Dipiroximum
B. Papaverini hydrochloridum
C. Unithiolum
D. Natrii thiosulfas
E. Atropini sulfas

4. The child, 2 years old, has drunk eye drops from the domestic first-aid set. A child`s condition is heavy, accompanied by significant sweating and salivation, asthmatic breath, cough, sharply narrowed pupils, muffled tones of the heart, bradycardia, low arterial pressure, intensive peristalsis of intestines, diarrhea. What preparation has caused a poisoning?
A. Pylocarpini hydrochloridum
B. Anaprilinum
C. Atropini sulfas
D. Plathyphyllini hydrotartras
E. Sulphacilum-narium

5. The victim processed plants with a solution of substance (insecticide) without individual means of protection. After a while excessive allocation of a saliva, sweat, tears, pain in the stomach and diarrhea began. Examination revealed miosis. What group does the substance which has caused such symptoms belong to?
A. Organic substances of phosphorus.
B. N-cholinomymethics.
C. Salt of copper.
D. Nitrates.
E. Organic compounds of chlorine.

6. Having used eye drops a patient with glaucoma has developed miosis and myopia, intraocular pressure has decreased. What group of preparations causes such effect?
A. M-Cholinoblockers
B. M-Cholinomymethics
C. α-adrenomimetics
D. N-cholinomimetics
E. Ganglionblockers

7. A patient 20 years old was delivered to a hospital with shop pain in the abdomen, vomiting, impeded breathing, dyspnea. During the patient's examination the following data were revealed: the skin is moist, hypersalivation, miosis, bradycardia muscular twitching. From the anamnesis it is known that the patient is a toxoman, he breathed in the aerosol for extermination of insects. What mechanism of action has the agent, which has caused poisoning?
A. M-cholinoblocking
B. N- cholinoblocking
C. M-cholinomimetic
D. N-cholinomimetic
E. M, N-cholinomimetic

8. Determine the drug. This drug is the alkaloid of the same plants as atropine is. It exerts significant inhibiting influence upon the CNS. In the clinical practice its inhibiting action upon the centers connected with the vestibular analyzer is used for treatment of motion sickness.
A. Methacinum
B. Scopolamini hydrobromidu**m**
C. Pirensepinum
D. Galantamini hydrobromidum
E. Platyphyllini hydrotartras

9. Determine the pharmacological group of drugs according to their properties: they cause tachycardia, improve atrioventricular conduction, suppress the secretion of glands, reduce spasm of smooth muscles of the inner organs, cause mydriasis, increase of intraocular pressure, paralysis of accommodation.
A. M-cholinoblocking
B. N- cholinoblocking
C. M-cholinomimetic
D. N-cholinomimetic
E. Anticholinesterases

10. Determine the pharmacological group of drugs according to their properties: they inhibit acetylcholinesterase, delay the hydrolysis of acetylcholine, facilitates the neuromuscular conduction, causes miosis and spasm of accommodation, increases the tonicity of smooth muscles of the inner organs and skeletal muscles.
A. M-cholinoblocking
B. N- cholinoblocking
C. M-cholinomimetic
D. N-cholinomimetic
E. Anticholinesterases

11. A 54-year-old male is delivered to the emergency room. He complains dry mouth, photophobia, blurred vision. Hyperemia and dryness of skin, mydriasis, increased intraocular pressure. His heart rate is 140 and his BP is 100/70 Hg. Which of the following treatments is indicated?
A. Proserinum
B. Pilocarpini hydrochloridum
C. Dipiroximum
D. Aceclidinum
E. Adrenalini hydrochloridum

12. Which one of the following is characteristic of parasympathetic stimulation?
A. Decrease in intestinal motility.
B. Inhibition of bronchial secretion
C. Contraction of sphincter muscle in the iris of the eye (miosis)
D. Contraction of sphincter of urinary bladder
E. Increase in heart rate.

13. During anesthesia a patient was injected with myorelaxant of depolarizing type of action. What antagonist the patient should be injected with to recommence his autonomous breathing?
A. Proserinum
B. Benzohexonium
C. Ditilinum
D. Cytitonum
E. Ethymisolum

14. A 59-years-old patient suffered from bowels paresis appeared on belly organs after the operation. What drug from anticholinesterase agents group should be prescribed to him?
A. Pilocarpinum

B. Carbacholinum
C. Aceclidinum
D. Proserinum
E. Acetylcholinum

15. A patient with myasthenia was injected with proserinum. Shortly after that sickness, vomiting, diarrhea, trembling of striped muscles appeared. Prescribe physiological antagonist of proserinum.
A. Atropini sulfas
B. Mesatonum
C. Fizostigminum
D. Pyridostigmini bromidum
E. Isadrinum

16. A patient was prescribed proserinum for treatment of bowels paresis. What pharmacological group this drug belongs to?
A. M-cholinomimetics
B. M-cholinoblockers
C. Anticholinesterase agents
D. N-cholinomimetics
E. N-cholinoblockers

17. Choose the drug for treatment a patient suffering from myasthenia:
A. Atropini sulfas
B. Proserinum
C. Tubocurarini chloridum
D. Pilocarpini hydrochloridum
E. Cocaini hydrochloridum

18. A 59-years-old patient suffered from urinary bladder paresis after removing the kidney. What cholinergic agent he should be prescribed with for stimulation of urinary bladder contractive activity?
A. Proserinum
B. Atropini sulfas
C. Prazosinum
D. Mesatonum
E. Methacinum

19. A 40-years-old man N. after traumatic brain injury was brought to the hospital because he felt bad. Complaints: muscle asthenia, motor activity failure. Which of the below mentioned drugs should be used for strengthening of contractive activity of striped muscles?

A. Melictinum
B. Tubocurarini hydrochloridum
C. Ditilinum
D. Proserinum
E. Hygronium

20. A patient suffering from glaucoma was prescribed medicinal drug decreasing intra-eye pressure. Name this medicinal agent.
A. Fenazepamum
B. Atropini sulfas
C. Proserinum
D. Analginum
E. Tetracyclinum

21. A patient suffering from glaucoma was prescribed M-cholinomimetic drug to decrease the intra-eye pressure. Name this drug.
A. Pilocarpini hydrochloridum
B. Mesatonum
C. Atropini sulfas
D. Adrenalini hydrochloridum
E. Ephedrini hydrochloridum

22. Atropini sulfas in eye drops was used during the research of patient's eyeground after that an acute pain appeared in eyeball area. During anamnesum it appeared that the patient had slight form of glaucoma. Why atropinum is contra-indicated in case of glaucoma?
A. Narrow pupils
B. Provoke dryness in the mouth
C. Increase intra-eye pressure
D. Decrease the distance of seeing
E. Suppress eye reflexes

23. Atropini sulfas was prescribed to the patient to relieve intestine colic. Which of the mentioned disease may be contra-indicative for this drug?
A. Hypotonia
B. Bronchial asthma
C. Headache
D. Glaucoma
E. Giddiness

24. A patient with complaints of giddiness, decreasing of eyesight, sickness, sialorrhea and spasmodic pangs in the stomach. Diagnosis: poisoning with fluoroorganic substances. What is necessary to include into the complex therapy?
A. Natrii thiosulfas and bemergidum
B. Tetacinum-calcium and unithiolum
C. Glucosum and bemergidum
D. Nalorphyni hydrochloridum and bemergidum
E. Atropini sulfas and dipiroximum

25. A child had residual phenomena followed poliomyelitis. What medication is needed to be prescribed?
A. Pyrroxanum.
B. Pentaminum.
C. Dimecolinum.
D. Atropini sulfas.
E. Galanthamini hydrobromidum.

26. An injection of galanthamini hydrobromidum had been made to a woman, 63 years old, after ischemic insult. Condition of the patient has considerably improved. What is the mechanism of effect of this medication?
A. Inhibition of dophamine-hydroxylase.
B. Inhibition of holynergic receptors.
C. Inhibition of catechol-orto-methyltranspherase.
D. Inhibition of acetylcholinesterase.
E. Inhibition of monoamineoxidase.

27. Pirenzepinum was prescribed to a woman for stomach ulcerative disease treatment. To which pharmacological group can this medication be referred to?
A. Selective α_1-adrenoblocators.
B. Reactivators of choline esterase.
C. β-adrenoblocators.
D. Selective M_1-cholineblocators.
E. Local anaesthetics.

28. It is necessary to prescribe a medication to a patient with glaucoma. Which medication (tertiary amine) isn't used in ophthalmologic practice due to its irritative influence on the eye conjunctive?
A. Phosphacolum.
B. Pyridostigmini bromidum.
C. Galanthamini hydrobromidum.
D. Proserinum.
E. Arminum.

29. The patient with glaucoma asked a pharmacist of a drugstore to give her eye drops of atropini sulfas, but she has been explained that atropine sulfate is contra-indicated in glaucoma. Why?
A. Due to increase of intraocular pressure.
B. It leads to a paralysis of accommodation.
C. It dilates the pupils.
D. It reduces distance of vision.
E. It narrows the field of vision.

30. The patient with myasthenia was administered the preparation which has improved muscular activity. But a number of disadvantages have gradually been developing: amplified allocation of saliva, sweating, diarrhea, nausea. What means should be applied for the treatment?
A. Arminum.
B. Analginum.
C. Strihnini nitras.
D. Coffeinum-narii benzoas.
E. Proserinum.

Assignment 5.
*Choose **all** correct answers:*

1. Aceclidinum:
1. is used in case of glaucoma
2. provokes spasm of accommodation
3. causes dilatation of pupils
4. increases intraocular pressure
5. causes spasmolytic effect
6. blocks the M-cholinoreceptors of the circular smooth muscles of the iris

2. Influence of Pilocarpini hydrochloridum on accommodation includes such points:
1. decreasing of humor outflow into Schlemm's canal
2. relaxation of Zinn ligament
3. flattening of crystalline lens
4. contraction of ciliary muscle
5. tension of Zinn ligament
6. crystalline lens becomes convex

3. For the treatment of poisoning by muscarine may be used:
1. Galanthamini hydrobromidum

2. Izonitrozinum
3. Platyphyllini hydrotartras
4. Carbacholinum
5. Scopolamini hydrobromidum
6. Atropini sulfas

4. A patient ill with glaucoma:
1. Shall be treated with Pilocarpini hydrochloridum
2. Must not be treated with Atropini sulfas
3. It is necessary to relax (slacken) the circular smooth muscle of the iris
4. It is contraindicated to relax (slacken) the circular smooth muscle of the iris
5. Bright light is contraindicated
6. Shall be treated with Atropini sulfas

5. Choose indications for administration of anticholinesterase drugs:
1. Gastric ulcer
2. Essential hypertension
3. Myasthenia
4. Epilepsy
5. Intestines atony
6. Glaucoma

6. Choose groups of drugs which are used in cases of poisoning by anticholinesterase drugs of irreversible action (phosphororganic drugs):
1. Muscarinic antagonists
2. Sympatholytics
3. Acetylcholinesterase reactivators
4. M-cholinomimetics
5. Ganglionic blocking agents
6. N-cholinomimetics

7. Putting drops of anticholinesterase drugs in an eye causes:
1. Miosis
2. Decrease in intraocular pressure
3. Spasm of accommodation
4. Dilation of the pupils
5. Increase in intraocular pressure
6. Paralysis of accommodation

8. Putting drops of Atropini sulfas in an eye causes:
1. Miosis
2. Dilation of the pupils

3. Spasm of accommodation
4. Increasing of intraocular pressure
5. Decreasing of intraocular pressure
6. Paralysis of accomodation

9. Platyphyllini hydrotartras:
1. Has M-cholinoblocking action
2. Has ganglioblocking action
3. Causes constriction of the vessels in the brain
4. Causes spasm of the intestines
5. Is a synthetic drug
6. Exerts direct spasmolytic action

10. Chose drugs belonging to M-cholinoblocking group:
1. Atropini sulfas
2. Pirenzepinum
3. Platyphyllini hydrotartras
4. Cocainum
5. Procainum
6. Proserinum

11. Pilocarpini hydrochloridum:
1. causes miosis
2. causes bradycardia
3. causes paralysis of accommodation
4. causes an increase in blood pressure
5. stimulates the salivary glands
6. produces bronchodilatation

12. For the treatment of glaucoma it is possible to use:
1. Atropini sulfas
2. Scopolamini hydrobromidum
3. Pilocarpini hydrochloridum
4. Aceclidinum
5. Lobelini hydrochloridum
6. Phasphacolum

13. M-cholinomimetic agents:
1. Pilocarpini hydrochloridum
2. Aceclidinum
3. Acetylcholinum
4. Atropini sulfas

5. Lobelini hydrochloridum
6. Proserinum

14. In the case of atony and paralytic (adynamic) ileus it is necessary to administrate:
1. Galanthamini hydrobromidum
2. Proserinum
3. Phosphacolum
4. Anaesthesinum
5. Novocainum
6. Atropini sulfas

15. Acetylcholinesterase reactivators are:
1. Dipyroximum
2. Izonitrozinum
3. Carbacholinum
4. Aceclidinum
5. Pyridostigmini bromidum
6. Alloximum

16. Anticholinesterase drugs cause:
1. Dilation of the pupils
2. Paralysis of accommodation
3. An increase in intraocular pressure
4. A decrease in intraocular pressure
5. An increase in tonus of gastrointestinal tract
6. A decrease in tonus of skeletal muscles

17. Scopolamini hydrochloridum and Atropini sulfas are:
1. Synergists in their action on the M-cholinoreceptors
2. Antagonists in their action on the M-cholinoreceptors
3. Different in their action on the CNS
4. Alike in their action on the CNS
5. Derivatives of the plants
6. Both are synthetic

18. M-Choliniblockers cause:
1. Bronchospasm
2. Bronchodilatation
3. Sialorrhea
4. Dry mouth
5. An increase in gastrointestinal motility

6. A decrease in gastrointestinal motility

19. In the case of bronchospasm this drugs should be administered:
1. Lidocainum
2. Anaesthesinum
3. Ipratropii bromidum
4. Pilocarpini hydrochloridum
5. Platyphyllini hydrotartras
6. Metacinum

20. Putting drops of Atropini sulfas in an eye cause:
1. A decrease in intraocular pressure
2. Hinder outflow of intraocular fluid
3. Constriction of the pupils
4. Paralyses of accommodation
5. An increase in intraocular pressure
6. Spasm of accommodation

21. Pilocarpinum:
1. is an m-cholinoblocker
2. is an m-cholinomimetic
3. is a ganglionic blocker
4. increases intraocular pressure
5. decreases intraocular pressure
6. increases skeletal muscles tone

22. Pilocarpinum applied topically to the cornea causes:
1. accommodative paralysis
2. an increase in ligament of Zinn tension
3. a decrease in intraocular pressure
4. miosis
5. the vision is fixed at short distance
6. contraction of the radial muscle of the iris

23. In the case of glaucoma are contraindicated:
1. Physostigminum
2. Aceclidinum
3. Platyphyllinum
4. Atropinum
5. Pilocarpinum

24. M-cholinomimetic effects of the gastrointestinal tract:

1. increased peristalsis
2. increased secretion
3. decreased peristalsis
4. decreased secretion
5. no effect

25. Which of the following are choline esterase reactivators?
1. Aceclidinum
2. Atropinum
3. Dipiroximum
4. Methacinum
5. Izonitrozinum

26. Anticholinesterase agents:
1. block acetylcholinesterase
2. prevent hydrolysis of acetylcholine
3. their action resembles that of M, N-cholinomimetics
4. activate acetylcholinesterase
5. enhance hydrolysis of acetylcholine

27. Anticholinesterase agents:
1. cause constriction of the circular muscle of the iris
2. increase drainage of aqueous humor
3. decrease drainage of aqueous humor
4. cause constriction of the radial muscle of the iris
5. is employed in glaucoma
6. is employed in the case of intestines atony
7. is used to lower blood pressure

28. Which of the following effects atropinum causes?
1. sharp fall of the blood pressure
2. decrease of peristalsis
3. orthostatic collapse
4. convulsions
5. irritation of the stomach mucosa
6. an increase of the intraocular pressure
7. dry mouth

29. Which of the following may cause tachycardia?
1. Atropinum
2. Galanthaminum
3. Carbacholinum

4. Dipiroximum
5. Proserinum
6. Platyphyllinum

30. Which of the following are M-cholinoblockers
1. Pilocarpinum
2. Izonitrozinum
3. Scopolaminum
4. Novocainamidum
5. Pirenzepinum
6. Ipratropium

31. Pilocarpinum applied topically to cornea causes:
1. contraction of the radial muscle of the iris
2. an increase in ligament of Zinn tension
3. spasm of accommodation
4. ciliary muscle contraction
5. an increase in the intraocular pressure

32. Which of the following cause miosis?
1. M-cholinomimetics
2. anticholinesterase agents
3. M-, N-cholinomimetics
4. ganglion blockers
5. M-cholinoblockers
6. muscle relaxants

33. To decrease intraocular pressure we shall use:
1. Atropinum
2. Pilocarpinum
3. Physostigminum
4. Pyridostigmini bromidum
5. Alloximum
6. Platyphyllinum

34. M-cholinomimetic effects:
1. bradycardia
2. an increase in bronchial muscle tone
3. an increase in bronchial glands secretion
4. tachycardia
5. a decrease in bronchial muscle tone
6. a decrease in bronchial glands secretion

35. Which of the following cause excitation of m, n-cholinergic receptors:
1. Acetylcholine
2. Carbacholinum
3. Pilocarpinum
4. Tubocurarini chloridum
5. Lobelinum

36. Anticholinesterase agents:
1. cause tachycardia
2. enhance neuromuscular transmission
3. cause miosis
4. increase intraocular pressure
5. increase smooth muscles tone
6. depress bronchial glands secretion

37. Proserinum is employed in treatment of :
1. glaucoma
2. intestines atony
3. bladder atony
4. myasthenia
5. bronchial asthma
6. renal colic
7. hypertension

38. In the case of poisoning by organophosphorous compound shall be employed:
1. Izonitrozinum
2. Dipiroximum
3. Proserinum
4. Pilocarpinum
5. Lobelinum
6. Atropinum

39. M-cholinoblockers:
1. decrease quantity of acetylcholine in ganglions
2. block N-cholinergic receptors of the parasympathetic ganglions
3. are employed in bronchial asthma
4. decrease muscle tone of the intestines
5. decrease intraocular pressure
6. block cholinergic receptors of the skeletal muscles
7. are contraindicated in glaucoma

40. Scopolaminum:
1. causes mydriasis
2. dilates bronchi
3. decreases gastric secretion and motor activity
4. causes spasm of accommodation
5. causes bradycardia
6. blocks N-cholinergic receptors of the ganglions

P. W. 7.

Theme:

N-Cholinomimetics. N-cholinoblockers (ganglionic blockers, neuromuscular blocking drugs). M-, N-cholinoblockers.

General questions:

1. Localisation of N-cholinoreceptors. Classification of N-cholinergic agents.
2. N-cholinomimetics. The most important pharmacologic effects. Clinical uses.
3. Toxic action of nicotine. Negative consequences of smoking.
4. Classification of the peripheral N-cholinoblockers. Ganglion blockers. The mechanism of action and pharmacologic effects. Clinical uses, adverse effects.
5. Myorelaxants. The mechanism of action and pharmacologic effects. Clinical uses and possible complications. Antagonists of myorelaxats.
6. Pharmacodynamics of M-, N-cholinoblockers. Clinical uses.

Classification of N-cholinergic agents:

1. N-cholinergic agonists (N-cholinomimetics)
   - Cytitonum
   - Lobelini hydrochloridum
2. N-cholinergic antagonists (N-cholinoblockers)

   A.Ganglioblockers:
   - Benzohexonium
   - Hygronium
   - Pirilenum
   - Pentaminum

   B. Neuromuscular blocking drugs (Myorelaxants)
   - Anatruxonium
   - Dythilinum (Listenone)
   - Mellictinum
   - Pipecuronium bromide (Arduan)
   - Diplacinum

3. M-, N-cholinoblockers:
   - Amizylum
   - Cyclodolum
   - Tropacinum

Home task on prescription:

Prescribe:

1. Lobelini hydrochloridum in ampoules.
2. Benzohexonium in tablets.

3. Cyclodolum in tablets.
4. Pipecuronii bromidum in ampoules.
5. Solution of Cytitonum.
6. Tropacinum in tablets.

CASE STUDY

A patient who has been a heavy smoker (2 packs of cigarettes per day for 30 years) comes to you for advice to quit smoking. You inform your patient that sudden cessation of smoking will result in withdrawal symptoms that may include restlessness, irritability, anxiety, tension, stress, intolerance, drowsiness, frequent awakenings from sleep, fatigue, depression, impotence, confusion, impaired concentration, gastrointestinal disturbances, decreased heart rate, and impaired reaction times. You advise your patient that successful cessation of tobacco use requires attention to both the positive and negative (withdrawal) reinforcement properties of nicotine and tobacco use. You plan, therefore, to combine both psychological and pharmacological treatment. What are some therapeutic approaches you can suggest?

Educational research work

Assignment 1.

Prescribe:

1. Benzohexonium in ampoules.
2. Hygronium in ampoules.
3. Pentaminum in ampoules.
4. Dythilinum in ampoules.
5. Amizylum in tablets.

Assignment 2.

Pharmaco-therapeutic task:

1. Drugs in depression of respiration.
2. Drugs for treatment of hypertensive crisis.
3. Drugs for treatment of gastric and duodenal ulcer.
4. Drugs, used for controlled hypotension.
5. A depolarizing myorelaxant.
6. Antagonist of non-depolarizing myorelaxant.
7. Drug for treatment of obliterating endarteritis.
8. Central cholinoblocker for neurosis treatment.
9. An antidepolarizing myorelaxant.
10. M, N-cholinoblockers for Parkinson disorder treatment.

Assignment 3.

Individual work: fill in the table.

Drugs	Dosage form	Indication to use
1. N-cholinomimetics: 2.Ganglioblockers: 3. Myorelaxants: 4. M-, N-cholinoblockers:		

Assignment 4.

*Choose **one** correct answer:*

1. During operation on the thyroid gland, to prevent excessive hemorrhage the doctor decided to use a method of controlled hypotension with the help of tricking intravenous introduction of a drug. Specify it.

A. Pentaminum.
B. Pirilenum.
C. Hygronium.
D. Cytitonum.
E. Pachycarpinum.

2. Injection of dithylinum (which had been introduced for simplification of reposition of a dislocation in a shoulder joint) evoked apnea in the patient. What is it necessary to introduce to the patient for restoration of breathing?

A. Fresh citrated blood.
B. Bemegridum.
C. Dipiroximum.
D. Isonitrosinum.
E. Galanthamini hydrobromidum.

3. A 53 year old man was admitted to a hospital in severe state with complaints of headache, vertigo, nausea. BP 220/120 mm Hg. After injection of 1ml of 2,5% benzohexonium solution the patient's state improved. Indicate the mechanism of action of this agent.

A. Blockade of beta-1-adrenoceptors.
B. Blockade of M-cholinoceptors.
C. Blockade of N-cholinoceptors of vegetative ganglions.
D. Excitation of alpha-adrenoceptors.
E. Blockade of alha-1-adrenoceptors.

4. A 35 year old man was admitted to a hospital due to poisoning with carbon monoxide. Indicate the drug which may be used in this situation due to reflex

stimulation of the respiratory centre as a result of stimulation of N-cholinoceptors of the carotid sinus.
A. Lobelini hydrochloridum.
B. Coffeinum.
C. Aethymizolum.
D. Camphora.
E. Bemegridum.

5. Ganglion blocker benzohexonium was introduced to a patient with hypertensive crisis. What complication can develop in the patient after introduction.
A. Disorder of gustatory sensibility.
B. Withdrawal syndrome.
C. Inhibition of the CNS.
D. Orthostatic hypotension.
E. Diarrhea.

6. What neurotropic hypotensive agent belongs to the group of ganglion blockers and is used to eliminate hypertensive crisis.
A. Propranololumum.
B. Octadinum.
C. Pentaminum.
D. Dopaminum.
E. Reserpinum.

7. The method of controlled hypotension is used in surgery for operations on heart and vessels. What ganglion blocker is used in this case?
A. Pentaminum.
B. Benzohexonium.
C. Pirilenum.
D. Hygronium.
E. Pachycarpinum.

8. Sings of tubocurarine overdosage appeared in a patient during operation. What drug should be used as an antagonist?
A. Alpha-adrenomimetic.
B. Cholinesterase inhibitors.
C. M-cholinoblockers.
D. Ganglion blockers.
E. Beta-adrenomimetics.

9. A 45 year old man with dislocation of shoulder joint was admitted to the hospital. What drug can be used to relax skeletal muscles and set the bone?

A. Analginum.
B. Dimedrolum.
C. Dithylinum.
D. Promedolum.
E. Acetylsalicylic acid.

10. Indicate the drug used in pulmonary edema on the background of arterial hypertension for decrease of blood pressure in pulmonary circulation.
A. Benzohexonium.
B. Strophanthinum.
C. Bemegridum.
D. Cordiaminum.
E. Ethyl alcohol.

11. It was appeared that a patient is lack of butiricholinesterase enzyme. The application of what myorelaxant is contra-indicated to him?
A. Ditilinum
B. Anatrucsonium
C. Tubocurarini hydrochloridum
D. Hygronium
E. Proserinum

12. A patient was injected ditilinum for the myorelaxation in order of reposition of broken-bone fragments in case of thigh-bone fraction. What pharmacological group this drug belongs to?
A. Anticholinesterase agents
B. M-cholinomimetics
C. Curari-like agents
D. M-cholinoblockers
E. Ganglioblockers

13. It was appeared that after short-time surgical operation conducted with the use of myorelaxant indication a patient had such symptoms as suppression of breathing, previous muscle tone wasn't recommence autonomously. Plasma transfusion stimulated the recommence of breathing and contractive activity of striped muscles. What myorelaxant was used?
A. Metacinum
B. Isadrinum
C. Anatrucsonium
D. Dithylinum
E. Hygronium

14. A 45-years-old woman which had the necessity of trachea intubation was brought to the hospital. Which of the below mentioned medicinal agents should be used for relaxing of striped muscles?
A. Dithylinum
B. Nitroglycerinum
C. Metronidazolum
D. Atropini sulfas
E. Gentamicini sulfas

15. It was appeared that after short-time surgical operation conducted with the use of dithylinum a patient had such symptoms as suppression of breathing, previous muscle tone wasn't recommence. What aid the patient should have?
A. Hemodialysis
B. Peritonial dialysis
C. Hemosorbtion
D. Plasma transfusion
E. Forced diuresis

16. A hospital patient being under the course of bronchial asthma treatment is suffered also from glaucoma disease. What drug is not recommended to include into therapy for bronchial asthma treatment in this case?
A. Isadrinum
B. Adrenlini hydrochloridum
C. Salbutamolum
D. Atropini sulfas
E. Fenoterolum

17. A child is suffered form poisoning with belladonna berries which contain atropine alkaloid. What of pharmacological groups this alkaloid belongs to?
A. M-cholinoblockers
B. N-cholinomimetics
C. N-cholinolitics
D. M-cholinomimetics
E. M,N-cholinomimetics

18. A patient is going to be operated on oral cavity organs. What drug should be prescribed to him for decreasing of salivation?
A. Proserinum
B. Atropini sulfas
C. Pilocarpini hydrochloridum
D. Aceclidinum
E. Physostigmini salicylas

19. A patient went to the ophthalmologist to examine eyeground. The doctor put drops in the eye which provoked pupil dilation and accommodation paralysis. What drug should be used?
A. Aceclidinum
B. Pilocarpini hydrochloridum
C. Proserinum
D. Atropini sulfas
E. Carbaholinum

20. A patient was brought to the hospital with such symptoms as giddiness, dryness in the mouth, pupils were very dilated, accommodation disturbance, tachycardia, urination worsening, intestine atony. Overdose with what drug might cause such symptoms?
A. Atropini sulfas
B. Furosemidum
C. Clofelinum
D. Captoprilum
E. Prazosinum

19. After the short-term operative intervention, with the use of dithyline, for over 30 minutes the patient was being noticed to have breathing oppression, previous muscle tonus hasn't restored. What assistance is necessary to be given to the patient?
A. Haemodialysis.
B. Blood or plasma transfusion.
C. Haemosorption.
D. Forced diuresis.
E. Peritoneal dialysis.

20. Before the operative intervention the dithyline solution had been injected to the patient and intubation had been performed. After the operative intervention self-breathing hasn't been restored. What enzyme insufficiency in this patient predetermines such prolonged effect of the myorelexant?
A. Pseudocholine esterase.
B. Succiante dehydrogenase.
C. Carboanhydrase.
D. N-acetyltranspherase.
E. K+/Na+-ATPase.

21. It is necessary to administer curaresimilar means of short-term action to the patient with fracture of the femur in order to reduce the tone of the cross-section-stripped muscules.
A. Arduanum.
B. Dithylinum.
C. Tubokurarini chloridum.
D. Pirilenum.
E. Mellictinum.

22. The symptoms of overdose with dithyline have appeared in a patient during operative intervention. What actions will be expedient to reduce the phenomena of overdose?
A. Introduction of M-cholinoblockers.
B. Introduction of anticholinesterase agents.
C. Introduction of ganglionblockers.
D. Transfusion of blood or plasmas.
E. Introduction of H-cholinoblockers.

23. For easing or discontinuation of excitation transference from the nervous ending of the muscular fibre, curare-like substances as muscle relaxants are clinically used. What is the mechanism of action of this group of medicines?
A. Depression of acetylcholinesterase
B. Inhibition of calcium ions passage through channels of presynaptic membranes.
C. Inhibition of Na +/K +-pumps activity.
D. Inhibition of H-cholinoreceptors postsynaptic membranes of the nervous - muscular synapse.
E. Reduction of allocation mediator in the synaptic fissure.

Assignment 5.
*Choose **all** correct answers:*

1. N-cholinergic receptors are placed mostly in:
1. endocrine glands
2. sympathetic ganglions
3. myoneural junction
4. adrenal medulla
5. carotid sinus
6. heart

2. N-cholinomimetic agents:
1. nicotine and benzohexonium

2. lobelinum and cytizine
3. stimulate breathing reflectory
4. stimulate respiratory center directly
5. block autonomic ganglion
6. are used in treatment of respiratory depression

3. Nicotinum:
1. is an alkaloid of tobacco leaves
2. exerts two-phase action on N-cholinergic receptors
3. acts both on central and peripheral N-cholinergic receptors
4. acts only on central N-cholinergic receptors
5. is an alkaloid of the fly agaric (death cap)
6. excites M-cholinergic receptors

4. Lobelini hydrochloridium:
1. stimulates breathing reflectory
2. is a glycoside
3. excites M-cholinergic receptors
4. mostly stimulates respiratory center directly
5. is an alkaloid
6. are used in treatment of respiratory depression

5. Ganglioblocking agents:
1. decrease arterial and venous blood pressure
2. decrease secretion
3. cause spasm of accommodation
4. cause paralysis of accommodation
5. cause spasm of peripheral vessels
6. decrease synthesis of adrenaline

6. Side effects of Ganglioblocking agents:
1. xerostomia
2. hypersecretion of saliva glands
3. orthostatic collapse
4. dysfunction of accommodation
5. bronchospasm
6. intestines atony
7. increases motility of intestines

7. N-cholinoblocking agents are:
1. Procainum
2. Benzohexonium

3. Pentaminum
4. Tubocurarini chloridum
5. Galanthamini hydrobromidum
6. Hygronium
7. Methacinum

8. Benzohexonium:
1. is poorly absorbed in intestines
2. is a quaternary amine
3. is a tertiary amine
4. is used for treatment of ulcer disease
5. is used for treatment of myasthenia
6. is used for treatment of hypertonic crises
7. may cause the orthostatic collapse

9. Competitive blocking agents (myorelaxants):
1. act by blocking transmission at the neuromuscular junctions
2. block N-cholinergic receptors of the neuromuscular junctions
3. block M-cholinergic receptors of the smooth muscles
4. block transmission of the impulses on the smooth muscles
5. effectively block N-cholinergic receptors of the ganglions
6. Block adrenoreceptors

10. Dithylinum:
1. is short-acting
2. is hydrolyzed by cholinesterase
3. causes lasting depolarization
4. is a competitive blocking agent
5. is long-acting
6. reduces the tone of the smooth muscles

11. N-cholinergic receptors are placed in:
1. carotid sinus
2. autonomic ganglions
3. neuromuscular junctions
4. bronchus
5. gastrointestinal tract
6. adrenal medulla
7. vessels

12. Agents which act directly on N-cholinergic receptors:
1. acetylcholinum

2. pilocarpinum
3. atropinum
4. ganglioblocking agents
5. myorelaxants
6. reactivators of cholinesterase

13. Lobelini hydrochloridum and Nicotinum:
1. are synergists
2. block neuromuscular transmission
3. react with different receptors
4. stimulate N-cholinergic receptors of the carotid sinuses
5. both of them stimulate M-cholinergic receptors of the heart
6. reactivators of cholinesterase

14. Cytitonum:
1. is 0,15% solution of cytizinum
2. is administrated intravenously
3. is a N-cholinomimetic
4. is 0,15% solution of lobelinum
5. is introduced only enteraly
6. is a M-cholinomimetic

15. Choose symptoms of the parasympathetic blockade resulting from administration of ganglioblocking agents:
1. dilatation of the arterial vessels
2. dilatation of the venous vessels
3. improvement of blood circulation in extremities
4. a decrease of salivation
5. a decrease of gastrointestinal motility
6. a reduction in gastric secretion

16. Agents which block N-cholinergic receptors:
1. Benzohexonium
2. Atropini sulfas
3. Lobelini hydrochloridum
4. Cytizinum
5. Tubocurarini chloridum
6. Pipecuronii bromidum

17. Choose indications for administration of ganglioblockers:
1. ulcer disease
2. hypertension

3. paralysis of intestines
4. myasthenia
5. spasm of peripheral vessels
6. anaphylactic shock

18. Benzohexonium:
1. blocks ganglions
2. stimulates breathing
3. blocks N-cholinergic receptors of the skeletal muscles
4. stimulates N-cholinergic receptors of the intercostal muscles and diaphragm
5. decreases blood pressure
6. decreases secretion and motility of the gastrointestinal tract
7. increases blood pressure

19. Tubocurarini chloridum:
1. is a ganglioblocking agent
2. is a competitive blocking agent
3. is a depolarizing agent
4. blocks N-cholinergic receptors
5. blocks M-cholinergic receptors
6. is a short-acting drug

20. In the case of overdosage by Dithylinum:
1. breathing deepens
2. occurs paralysis of the respiratory muscles
3. artificial ventilation is needed
4. anticholinesterase agents shall be administered
5. fresh citrated blood shall be administered
6. depression of the CNS shall be provided

21. N-cholinergic receptors are located:
1. in blood vessels
2. in carotid glomus
3. in bronchial muscles
4. in skeletal muscles
5. in epinephros
6. in myocardium

22. Which of the following excite N-cholinergic receptors?
1. Azametonium
2. Procainum
3. Benzohexonium

4. Cytitonum
5. Lobelinum

23. Which of the following act on N-cholinergic receptors?
1. Pilocarpinum
2. Atropinum
3. ganglionic blocker
4. muscle relaxant
5. acetylcholinesterase reactivator

24. Effects produced by ganglionic blockers:
1. reflectory bradycardia
2. hypotension
3. hypertension
4. increased peristalsis
5. decreased peristalsis
6. respiratory disturbances
7. pharmacological denervation of the viscera

25. Hygronium:
1. blocks sympathetic ganglions
2. blocks parasympathetic ganglions
3. employed for controlled hypotension
4. employed in the case of myasthenia
5. excites N-cholinergic receptors of the epinephros
6. causes orthostatic collapse
7. causes CNS excitation

26. Benzohexonium is indicated in the case of:
1. gastric ulcer
2. hypertensive crisis
3. hypotension
4. hypochlorhydria
5. myasthenia

27. Pirilenum:
1. is a tertiary amine
2. readily absorbed in the stomach
3. is a ganglionic blocker
4. is a quaternary ammonium compound
5. poorly absorbed in the intestines
6. excites ganglions

28. Muscle relaxants:
1. act on N-cholinergic receptors in neuromuscular synapses
2. are atropine antagonists
3. cause a rise in blood pressure
4. in the case of overdosing cause respiratory muscles paralysis
5. cause skeletal muscles relaxation
6. are used to potentiate anesthetic agents

29. Which of the following are nondepolarizing muscle relaxants?
1. Pipecuronii bromidum
2. Dithylinum
3. Benzohexonium
4. Pentaminum
5. Tubocurarinum

30. In the case if dithylinum overdosage:
1. respiratory movements become deeper and quicker
2. respiratory muscles become paralyzed
3. artificial ventilation is indicated
4. anticholinergic drugs shall be administered
5. blood transfusion shall be done
6. CNS depressants shall be administered

31. N-cholinergic receptors are situated:
1. in sympathetic ganglions
2. in parasympathetic ganglions
3. in epinephros
4. in smooth muscles of gastrointestinal tract
5. in bronchi
6. in skeletal muscles
7. in CNS
8. in smooth muscles of vessels

32. Which of the following cause N-cholinergic receptors excitation?
1. Carbacholinum
2. Lobelinum
3. Tubocurarinum
4. Pancuronium
5. Hygronium
6. Cytitonum

33. Cytitonum:
1. causes excitation of N-cholinergic receptors in carotid glomus
2. causes a rise of blood pressure
3. increases respiratory movements
4. decreases blood pressure
5. relaxes skeletal muscles
6. dilates pupils

34. Side effects of ganglionic blockers:
1. dry mouth
2. hypersalivation
3. orthostatic collapse
4. disturbance of accommodation
5. bronchospasm
6. intestines atony
7. increased motility of intestines

35. Ganglionic blockers:
1. block N-cholinergic receptors
2. block M-cholinergic receptors
3. block M and N-cholinergic receptors
4. block mediator release in ganglions
5. destroy mediator in synaptic cleft

36. Ganglionic blockers cause:
1. hypotension
2. hypertension
3. hypersecretion of the stomach glands
4. hyposecretion of the stomach glands
5. a rise in the tonus of bronchi
6. paralysis of accommodation
7. skeletal muscles paralysis

37. For controlled hypotension are used:
1. Arphonadum
2. Hygronium
3. Pirilenum
4. Pentaminum
5. Pachycarpinum

38. Muscle relaxants:
1. act on N-cholinergic receptors of neuromuscular synapses

2. are atropine antagonists
3. cause hypertension
4. in the case of overdosing cause respiratory muscles paralysis
5. викликають розслаблення скелетних м'язів
6. are used to potentiate anesthetic drugs

39. Tubocurarinum:
1. is a ganglionic blocker
2. is a nondepolarizing muscle relaxant
3. is a depolarizing muscle relaxant
4. blocks N-cholinergic receptors
5. blocks M-cholinergic receptors

40. What would be appropriate to use in the case of dithylinum overdosing?
1. anticholinesterase drugs
2. cholinesterase reactivators
3. blood transfusion
4. artificial respiration
5. intravenous injection of cytitonum

P. W. 8-9.

Theme:

Agents affecting the adrenoreceptors. Adrenomimetic drugs. Sympathomimetics. Antiadrenergic drugs. Adrenoblockers and sympatholytics.

General questions:

1. Localisation of adrenoreceptors. Classification of adrenergic drugs.
2. Drugs stimulating α and β-receptors (α–, β–adrenomimetics of direct and indirect action), the mechanism of action, main and adverse effects, clinical use.
3. Drugs stimulating α-adrenoreceptors, mainly (α-adrenomimetics): the mechanism of action, main and adverse effects, clinical use.
4. Drugs stimulating β-adrenoreceptors, mainly (β-adrenomimetics): the mechanism of action, main and adverse effects, clinical use.
5. Sympathomimetics: the mechanism of action, main and adverse effects, clinical use.
6. Agents affecting the adrenoreceptors. Adrenergic antagonists.
7. Classification of adrenoblockers, the mechanism of action, pharmacologic effects.
8. α-adrenoblockers, classification, non-selective and selective action, the mechanism of action, clinical uses, adverse effects.
9. β-adrenoblockers of non-selective and selective action, the mechanism of action, clinical uses, adverse effects.
10. Sympatholytics (Reserpine, Octadine, Ornide, Methyldopha). Localisation and mechanism of action. Pharmacologic effects, clinical uses, adverse effects.

Classification of adrenomimetics

I. Direct-acting adrenomimetics:

1. α- and β-adrenomimetics:
   - Adrenalini hydrochloridum (α1,α2,β1,β2)
   - Noradrenalini hydrochloridum (α1, α2, β2)

3. α-adrenomimetics:

α_1-adrenomimetics:

- Mesatonum

α_2-adrenomimetics:

- Naphthysinum (Sanorinum)
- Halozolinum (Xylometazoline)
- Clofeline (α2)

4. β-adrenomimetics:

β_1-adrenomimetics:

- Dobutaminum

β_2-adrenomimetics:

- Salbutamolum
- Fenoterolum (Berotec, Partusisten)

II. Indirect-acting adrenomimetics (Sympathomimetics):

- Ephedrini hydrochloridum

Classification of Adrenergic Blockers

I. Adrenoblockers of direct action:

1. α-blockers:
   - Phentolamini hydrochloridum (α1, α2)
   - Prazosinum (α1)
   - Doxazosinum (α1)
   - Pyrroxanum (α1)
2. β-blockers:

a) non-selective β-adrenoblockers:

- Propranololumum (Anaprilinum, Inderal) (β1,β2)

b) selective β-adrenoblockers:

- Atenololumum (β1)
- Metoprololumum (β1)
- Timololum (β1)
- Nadololum (β1)

3. β1, α1–blockers:
   - Labetololum
   - Carvediolum

II. Adrenergic blockers of indirect action (Sympatholytics):

- Reserpinum
- Octadinum
- Methyldopha

Home task on prescription:

Prescribe:

1. Noradrenalini hydrochloridum in ampoules.
2. Mesatonum in ampoules.
3. Naphthysinum in drops into nose.
4. Fenoterolum in vial and tablets.
5. Salbutamolum in aerosol.
6. Ephedrini hydrochloridum in tablets and powders.
7. Phentolamini hydrochloridum in tablets.

8. Propranololum (Anaprilinum) in ampoules.
9. Metoprololum in tablets.
10. Pyrroxanum in ampoules.
11. Atenololum in tablets.
12. Reserpinum in tablets

CASE STUDY

1. T. L. is a highly successful scientist who spends long hours in the laboratory and is constantly in demand as a speaker and reviewer for scientific papers and grants. He has a family history of cardiovascular disease, having lost both his father and grandfather before either reached age 60. He has recently noticed decreased energy, especially during exercise, and had symptoms (difficulty in breathing, chest pain) that took him to the emergency department. The examining physician thought the best treatment would be short-term therapy with a directly acting inotropic agent, especially one that would not markedly increase an already elevated heart rate. Based on a knowledge of the distribution of cardiovascular autonomic receptors, which of the following agents - epinephrine, norepinephrine or dobutamine - would be a logical choice to use in this initial short-term treatment?

2. A 61-year-old man with congenital heart disease and a history of chronic congestive heart failure was seen by an ophthalmologist for a routine eye examination. In general, the patient's health was reasonable and cardiac output was well compensated. During the examination, the physician found that the patient had open-angle glaucoma that required treatment to reduce the pressure in the eye. The ophthalmologist prescribed one eyedrop twice daily in each eye. Several months later the patient began to gain weight, became dyspneic and complained of "asthmatic attacks." An examination showed bronchospasm and severe congestive heart failure with a slow ventricular rate. Gastrointestinal function was normal. The eyedrops were stopped and the patient's condition stabilized. Is it possible that the eyedrops were responsible for the development of cardiopulmonary complications, and if so, what is a likely offending drug?

Educational research work.

Assignment 1.

Prescribe:

1. Adrenalini hydrochloridum in ampoules.
2. Mesatonum in powders.
3. Salbutamolum in tablets.
4. Xylometazolinum in vial.
5. Fenoterolum in aerosol.
6. Propranololum (Anaprilinum) in tablets.

7. Doxazosinum in tablets.
8. Metoprololum in ampoules.
9. Reserpinum in powders.
10. Methyldopha in tablets.

Assignment 2.

Pharmaco-therapeutic task:

1. An adrenomimetic stimulating all subtypes of adrenoreceptors.
2. An adrenomimetic stimulating α-adrenoreceptors only.
3. An adrenomimetic with indirect action.
4. Adrenomimetics for nasal congestion.
5. An adrenomimetic for premature labor and for dysmenorrhea.
6. An adrenomimetic for relief of bronchospasm in patient with reversible obstructive airway disease.
7. An adrenomimetic used to maintain blood pressure in acute hypotensive state.
8. An adrenomimetic for anaphylactic shock treatment.
9. α-adrenomimetic for oral administration.
10. Adrenomimetics stimulating β_2-adrenoreceptors.
11. Selective α1-adrenoblocker used in treatment of arterial hypertension.
12. Drug used in treatment of pheochromocytoma.
13. Drug used in treatment of obliterating endarteritis.
14. Non-selective β-adrenoblocker.
15. Selective β1-adrenoblockers used in treatment of angina pectoris, disorders of cardiac rhythm and arterial hypertension.
16. Sympatholytics used in treatment of arterial hypertension.
17. α_1-adrenoblocker with prolong action.
18. An sympatholytic with neuroleptic effect.
19. Drugs with antiarrythmic effect.
20. Adrenoblocker for prostate hyperplasia treatment.

Assignment 3.

Individual work: fill in the table.

Drugs	Dosage form	Indication to use
1. α-, β-adrenomimetics: 2. α-adrenomimetics: 3. β-adrenomimetics: 4. Sympathomimetics: 5. α-adrenoblockers: 6. β-adrenoblockers:		

7. Sympatholytics:		

Assignment 4.

*Choose **one** correct answers:*

1. In the reanimation department a patient intra-cardiac was injected adrenalini hydrochloridum in time of heart stop. What is the mechanism of drug action in this situation?

A. Stimulation of β_1-adrenoreceptors
B. Stimulation of α-adrenoreceptors
C. Stimulation of β_2-adrenoreceptors
D. Blockade of α-adrenoreceptors
E. Blockade of β_2-adrenoreceptors

2. A woman with hypoglycemic coma was brought into the ambulance department. What medicinal agent should be prescribed in this pathological state?

A. Aminazinum
B. Pilocarpini hydrochloridum
C. Adrenalini hydrochloridum
D. Biseptolum
E. Clofelinum

3. A patient is suffered from anaphylactic shock. Name the chosen drug for the treatment of this state.

A. Mesatonum
B. Adrenalini hydrochloridum
C. Corglyconum
D. Fenoterolum
E. Noradrenalini hydrotartras

4. A patient is suffered from bronchial asthma and is taking the drug from beta-adrenomimetics group. Name this drug.

A. Atropini sulfas
B. Doxazosinum
C. Aceclidinum
D. Salbutamolum
E. Metoprololum

5. A patient suffering from bronchial asthma is prescribed broncholytic in order to prevent attacks. Which is this drug?

A. Salbutamolum
B. Noradrenalini hydrotartras

C. Metronidazolum
D. Proserinum
E. Anaprilinum

6. A patient suffering from bronchial asthma was prescribed salbutamolum and after that the symptoms of bronchospasm disappeared. This is connected with stimulation:
A. Acetylcholinum synthesis
B. Beta-1-adrenoreceptors
C. M-cholinoreceptors
D. Beta-2-adrenoreceptors
E. Alpha-1-adrenoreceptors

7. A patient suffering from bronchial asthma has several attacks during the day. Which below mentioned drugs can be used for its prevention?
A. Diclofenac-natrium
B. Salbutamolum
C. Aspirinum
D. Dobutaminum
E. Analginum

8. In pulmonological department a patient suffering from obstructive bronchitis with spastic component was prescribed broncholytic which has the therapeutic effect to stimulate beta-2-adrenoreceptors of smooth bronchi muscles. Indicate this drug.
A. Prazosinum
B. Cromolin-natrium
C. Euphyllinum
D. Methacinum
E. Salbutamolum
9. The first aid doctor was called to a sick with bronchial asthma, 40 years old, who had attack of bronchial asthma with manifestations of stenocardia. What preparations are the most effective for the urgent help?
A. Ephedrini hydrochloridum.
B. Salbutamolum.
C. Adrenalini hydrochloridum.
D. Atropini sulfas.
E. Plathyphyllini hydrotartras.

10. The patient came to the doctor complaining of health state deterioration. During a waiting time he had attack of bronchial asthma. Preparations of what group are expedient for applying to grant him the first medical aid?

A. Sympatholitics
B. N-cholinomymetics.
C. M-cholinomymetics.
D. β-adrenomimetics
E. β-adrenoblockers

11. During operative intervention with additional use of hygronium the patient`s arterial pressure has sharply decreased. What groups of medical means can normalize arterial pressure in the given situation?
A. N-cholinomymethis.
B. β-adrenoblockers.
C. Ganglionblockers.
D. M-cholinomymetics.
E. α-adrenomymetics.

12. What medical means is equal to such characteristics: synthetic catecholamine, stimulates b1-and b2-adrenoreceptors, provides active work of the heart, predetermines increase in frequency of intimate reductions. But application of a preparation can lead to decrease of arterial pressure, oppression of sexual activity, it is the pharmacological antagonist to propranolol. What is a preparation?
A. Pylocarpini hydrochloridum.
B. Carbaholinun.
C. Aceclidinum.
D. Isadrinum.
E. Acetylcholinum.

13. The patient in a condition of acute vascular insufficiency (collapse) resultant from heavy poisoning with unknown substance has been delivered to the reception of a hospital. Which of the below-mentioned preparations should be used to provide urgent medical help?
A. Propranololum.
B. Naphthysinum.
C. Isadrinum.
D. Salbuthamolum.
E. Mesatonum.

14. A patient occurs spasm of smooth muscles of bronchi. Using of what activators will be physiologically reasonable for emergency treatment?
A. α-adrenoreceptors
B. D-receptors
C. N-cholinoreceptors
D. α- and β-adrenoreceptors

E. β-adrenoreceptors

15. The patient, 42 years old, has bronchial asthma. To relieve attacks of a bronchospasm the doctor has appointed Salbutamol. What is its medical effect?
A. Stimulation of β2-adrenoreceptors
B. Blockade of β2-adrenoreceptors
C. Stimulation of α2-adrenoreceptors
D. Stimulation of β1-adrenoreceptors
E. Stimulation of α1-adrenoreceptors

16. The patient has anaphylactic shock. From which of listed adrenomimetics is it possible to expect the greatest therapeutic effect?
A. Mesatonum.
B. Adrenalini hydrochloridum.
C. Ephedrini hydrochloridum.
D. Noradrenalini hydrotartras.
E. Alupent.

17. The patient during attendance of the traumatologist had acute hypotension. What of the drugs which stimulate adrenoceptive innervation do you suggest to use for normalization of arterial pressure?
A. Doxazosinum.
B. Xilometazolinum.
C. Sanorinum.
D. Mesatonum.
E. Ergotaminum.

18. The man, 63 years old, was delivered to the emergency unit of the hospital in a condition of collapse. In order to fight hypotension, the doctor has chosen noradrenalini hydrotartras. What is the mechanism of hypertensive action of this drug?
A. Activation of β-adrenoreceptors
B. Activation of serotoninoreceptors.
C. Activation of α_1-adrenoreceptors.
D. Activation of dopaminereceptors.
E. Inhibition of M-cholinereceptors.

19. With the diagnostic purpose (expansion of pupils in order to inspect the eye bottom) an ophthalmologist used 1 % solution of Mesatonum. Mydriasis followed administration of preparation is the result of:
A. Inhibition of α_1-adrenoreceptors

B. Activation of β_2-adrenoreceptors
C. Activation of α_1-adrenoreceptors
D. Activation of β_1-adrenoreceptors
E. Activation of M-cholinoreceptors.

20. During removal of a tooth the patient developed bleeding. The dentist has imposed a tampon with medical means, and the bleeding has decreased. What drug has been used by the doctor?
A. Oktadinum.
B. Isadrinum.
C. Salbutamolum.
D. Adrenalini hydrochloridum.
E. Prazosinum.

1. A 36 years old female patient sufering from ischemic heart disease has been prescribed propranololum. But having found a concomitant desease the doctor decided to replace this drug by athenolol. What disease was found by the doctor?
A. Cholecystitis.
B. Arterial hypertension.
C. Duodenal ulcer.
D. Myasthenia.
E. Bronchial asthma.

2. A 60 years old woman, suffering from toxic goiter, complains of constant palpitation. What drug should be prescribed for normalization of heart rate?
A. Isadrinum.
B. Propranololumum.
C. Salbutamolum.
D. Adrenalini hydrochloridum.
E. Penthaminum.

3. For the treatment of a exertional angina a selective β_1-adrenergic blocker, which has no internal sympathomimethic activity, was prescribed. It is known, that the drug is lipophilic, has average duration of action and is produced in tablets and ampoules. What drug is it?
A. Talinololum.
B. Metoprololumum
C. Benzohexonium.
D. Drotaverini hydrochloridum.
E. Propranololumum.

4. For the treatment of ischemic heart disiase a patient has been given β-adrenoblocker. After a while he had a cough and bronchospasm. What of the drugs has such evident side action?
A. Atenololumum.
B. Talinololum.
C. Propranololumum.
D. Nifedipinum.
E. Metoprololumum.

5. A patient who had been suffering from arterial hypertension was treated with the drug which mechanism of action is connected with exhaustion of noradrenalin content in sympathetic nerve endings. Indicate this drug.
A. Reserpinum
B. Clophelinum
C. Propranololumum
D. Prazosin
E. Dibazolum

6. Indicate the group of drugs to which prazosin belongs.
A. Nonselective beta-adrenoblockers.
B. Cardioselective beta-adrenoreceptors.
C. Alpha-adrenoblockers.
D. Sympatholytics.
E. Angiotensin converting enzyme inhibitors.

7. Propranololum was administered to a patient with hypertension that normalized BP fast. What is the mechanism of action of this dug?
A. Inhibition of phosphodiesterase
B. Blockade of beta1-adrenoreceptors
C. Blockade of alpha-1-adrenoreceptors
D. Blockade of beta1 and beta-2-adrenoreceptors
E. Stimulation of alpha-2-adrenoreceptors

8. Propranololum was prescribed to a patient with arterial hypertension accompanied by obstructive bronchitis. After that the attack of bronchospasm occured in the patient. Indicate the reason of this side-effect.
A. Blockade of beta1-adrenoreceptors of bronchi.
B. Stimulation of beta2-adrenoreceptors of bronchi.
C. Blockade of alpha2-adrenoreceptrs of bronchi.
D. Blockade of beta2-adrenoreceptors of bronchi.
E. Stimulation of alpha1-adrenoreceptors of bronchi.

9. A patient suffers from arterial hypertension accompanied by chronic obstructive bronchitis. Indicate hypotensive agent which is contraindicated for the patient?
A. Prazosinum
B. Propranololumum
C. Nifedipinum
D. Hydrochlorthiazidum
E. Captoprilum

10. Ischemic heart disease accompanied by cardiac arrhythmia was diagnosed in 50 years-old patient. Indicate the group of drugs which should be administered.
A. Beta-adrenoblockers
B. Alpha-adrenoblockers
C. Beta-adrenomimetics
D. Alpha-adrenomimetics
E. Sympatholytics

11. Therapy with propranololum has positively affected the course of the disease of a 44- year-old woman with angina pectoris. What is the mechanism of antianginal action of this drug?
A. Inhibition of β_1-adrenoreceptors and decrease the need of the myocardium for oxygen.
B. Decrease of the oxidative exchange in the myocardium due to the inhibition of the enzymes of Krebs cycle.
C. Decrease of the myocardium energy expenses due to decrease of loading.
D. Increase of oxygen coming into the myocardium.
E. Decrease of the need for oxygen and increase of the coming of oxygen into the myocardium.

12. A patient suffering from ischemic heart disease did not inform the doctor about the attacks of bronchospasm he sometimes had. The doctor prescribed a drug, the intake of which made the attacks of a angina pectoris less frequent, but attacks of bronchospasm became more frequent. What drug has been prescribed?
A. Nitroglycerinum.
B. Verapamilum.
C. Nitrosorbidum.
D. Propranololumum.
E. Diltiazemum.

13. The patient, suffering from idiopathic hypertensia, had the acompanying diseases: ciliary arrhythmia, stenocardia, and chronic bronchitis. The physician has decided to use a drug from the group of beta-adrenoblockers. Which agent should be used, taking into account the acompanying diseases?
A. Metoprololumum
B. Timololum
C. Propranololumum
D. Pindololum
E. Oxprenololum

14. A 40 year old patient suffers from arterial hypertension with hyperkinetic type of circulation and increased level of renin, stenocardia, sinus tachycardia. Indicate the group of drugs which is more preferable for treatment of this patient.
A. Organic nitrates.
B. Beta-adrenoblockers
C. Alpha-adreoblockers.
D. Sympatholytics.
E. Ganglion blockers.

15. Pheochromocytoma (tumor of adrenal medulla) was diagnosed in a patient after clinical and laboratory examination. What preparation from the group adrenoblockers can be used for treatment of this patient?
A. Prazosinum
B. Propranololumum
C. Talinololum
D. Labetalolum
E. Tropaphenum (tropodiphene)

16. Indicate the state in which nonselective beta-adrenoblockers are contraindicated?
A. Thyrotoxicosis
B. Bronchial asthma
C. Cardiomyopathy
D. Myocardial infarction
E. Arterial hypertension

17. Beta-adrenoblocker was prescribed to a patient for the treatment of ischemic heart disease but after some time cough and bronchospasm occured. Indicate the agent which was administered.
A. Propranololumum
B. Talinololum

C. Atenololumum
D. Nifedipinum
E. Metoprololumum

18. Which of the following antiarrhythmic drug is contraindicated for a patient with cardiac arrhythmia accompanied by bronchial asthma?
A. Ajmalinum
B. Verapamilum
C. Propranololumum
D. Nifedipinum
E. Procainamidum

19. A 50 years old woman suffering from hypertension has taken a drug. In an hour BP was increased, but in 2 hors it started to decrease. Indicate the drug.
A. Prazosinum
B. Reserpinum
C. Octadinum (guanethidinum)
D. Dibazolum (bendazolum)
E. Propranololumum

20. A patient who had been suffering from severe form of arterial hypertension after examination received diagnosis of pheochromocytoma (tumor of adrenal medulla which is accompanied by increased synthesis of adrenaline). Indicate the group of drugs which should be administered to a patient before surgical treatment.
A. Alpha-adrenoblockers
B. Calcium channel blockers
C. Sympatholytics
D. Ganglion blockers
E. Beta-adrenoblockers

Assignment 5.
*Choose **all** correct answers:*

1. It is possible to use as a nasal decongestant:
1. Xylometazolinum
2. Isadrinum
3. Mesatonum
4. Prazosinum
5. Reserpinum
6. Ephedrinum

2. Adrenalinum:
1. increases heart contractility and rate of constrictions
2. constricts the peripheral mesenteric vessels
3. constricts bronchus
4. causes mydriasis
5. dilates bronchus
6. decreases glucose concentration in blood

3. β_1-adrenoreceprors:
1. are located in the myocardium
2. activation increases myocardial oxygen consumption
3. activation causes vasoconstriction
4. activation causes glycogenolysis
5. activation produces stimulation of the heart
6. activation cause a decrease in cardiac rate and output

4. Ephedrini hydrochloridum exerts such effects as:
1. a decrease in blood pressure
2. bronchodilation
3. miosis
4. stimulation of the CNS
5. an increase in blood pressure
6. hyperperistalsis

5. Salbutamolum differs from Isadrinum in such respects:
1. it mostly exerts beta-2-adrenomimetic action
2. mostly exerts beta-1-adrenomimetic action
3. shall be administered parenteraly
4. it has not so strong action on the heart
5. has more selective action on the bronchus
6. exerts alpha-adrenoreceptors

6. Which drugs cause bronchodilation?
1. Isadrinum
2. Propranololumum
3. Metoprololumum
4. Salbutamolum
5. Phenoterolum
6. Ephedrinum

7. Adrenomimetics are:
1. Prazosinum

2. Isadrinum
3. Mesatonum
4. Propranololumum
5. Metoprololumum
6. Salbutamolum

8. Activation of the β_2-adrnoreceptors causes:
1. heart stimulation
2. dilatation of the vessels in skeletal muscles
3. bronchodilation
4. a decrease in glycogenolysis
5. a decrease in the insulin secretion
6. tocolytic effect (inhibition of the myometrium contractile ability)

9. Norepinephrine differs from epinephrine in such respects:
1. mostly exerts alpha-adrenergic receptors
2. activates β_2-adrnoreceptors stronger then epinephrine does
3. should be preferred for treatment of the asthma
4. is not destroyed by MAO
5. more selectively activates alpha-adrenoreceptors
6. is favorable for treatment of collapse

10. Administration of the Adrenalini hydrochloridum causes:
1. a decrease in heart contractility and rate of constrictions
2. bronchodilation
3. constriction of the bronchus
4. causes hypoglycemia
5. vasoconstriction of the viscera
6. dilatation of the brain, heart and skeletal muscles vessels

11. Noradrenalini hydrotartras might be used in the cases of:
1. asthma
2. glaucoma
3. psychic depression
4. myasthenia
5. collapse
6. potentiation of local anesthetics action

12. In the case of rhinitis it is possible to instill into nose:
1. Naphthyzinum
2. Mesatonum
3. Galazolinum (xylometazolinum)

4. Isadrinum
5. Ephedrinum
6. Salbutamolum

13. Choose combinations which are useful in the case of bronchial asthma:
1. Adrenalinum + Propranololumum
2. Noradrenalinum + Reserpinum
3. Mesatonum + Prazosinum
4. Ephedrinum + Atropinum
5. Fenoterolum + Platyphyllinum
6. Proserinum + Cordiaminum

14. Action of Ephedrini hydrochloridum is characterized by:
1. hypotension
2. bronchodilation
3. miosis
4. stimulation of CNS
5. depression of CNS
6. decongestant activity

15. Noradrenalini hydrotartras is used in the case of:
1. bronchial asthma
2. glaucoma
3. potentiation of local anesthetic action
4. myasthenia
5. collapse
6. hypertensive crisis

16. Noradrenalini hydrotartras shows hypertensive action via:
1. excitement of vasomotor center
2. stimulation of medulla of epinephros
3. increase of the heart contractility
4. excitement of sympathetic ganglia
5. stimulation of α-adrenoreceptors
6. stimulation of β-adrenoreceptors of the vessels

17. In the case of rhinitis for instillation in the nose such drugs are indicated:
1. Naphthyzinum
2. Mesatonum (phenylephrinum)
3. Halazolinum (xylometazolinum)
4. Isadrinum
5. Salbutamolum

6. Ephedrinum

18. Mediator norepinephrine (noradrenalin):
1. is synthesized in the blood
2. is synthesized in the endings of postganglionic nervous fibers
3. is synthesized in the CNS
4. is inactivated by monoamine oxidase
5. is decomposed by cholinesterase
6. is synthesized by the instrumentality of cholinacetilasa

19. Contraindications for administration of Isadrinum:
1. hypertension
2. angina pectoris
3. bronchospasm
4. acute cardiac insufficiency
5. renal hypertension
6. tachycardia

20. Choose drugs which are able to dilate bronchi:
1. Isadrinum
2. Propranololumum
3. Metoprololumum
4. Salbutamolum
5. Phenoterolum
6. Ephedrinum

21. Ephedrini hydrochloridum:
1. decreases blood pressure
2. has broncholytic action
3. causes miosis
4. stimulates CNS
5. depresses CNS
6. causes an increase in heart contractility

22. Adrenalinum causes vasoconstriction due to:
1. β1-adrenoreceptors stimulation
2. β1-adrenoreceptors blockade
3. β2-adrenoreceptors stimulation
4. α-adrenoreceptors stimulation
5. α-adrenoreceptors blockade

23. Adrenalini hydrochloridum causes bronchodilatation due to:

1. β1-adrenoreceptors stimulation
2. β1-adrenoreceprors blockade
3. β2-adrenoreceptors stimulation
4. α-adrenoreceptors stimulation
5. α-adrenoreceptors blockade

24. Adrenalini hydrochloridum causes pupil dilatation due to:
1. α1-adrenoreceptors stimulation
2. α2-adrenoreceptors stimulation
3. β1-adrenoreceptors stimulation
4. β2-adrenoreceptors stimulation

25. Stimulating β-adrenoreceptors adrenaline causes:
1. bronchodilatation
2. mydriasis
3. an increase in renin production
4. an increase in the strength of myocardium contractions
5. an increase of the heart rate

26. Stimulating β1-adrenoreceptors adrenaline causes:
1. an increase in the strength of myocardium contractions
2. an increase of the heart rate
3. an increase in renin production
4. blood vessels dilatation
5. bronchodilatation

27. Stimulating β2-adrenoreceptors adrenaline causes:
1. coronary vessels dilatation
2. bronchodilatation
3. an increase in the strength of myocardium contractions
4. enhancement of atrioventricular conduction
5. an increase in the strength of myocardium contractions

28. Mesatonum:
1. α-adrenoblocker
2. α-adrenomimetic
3. causes an increase in blood pressure
4. decreases arterial pressure
5. causes vasoconstriction
6. increases myocardium contractility

29. Mesatonum:

1. α-adrenomimetic
2. causes an increase in blood pressure
3. causes hypotension
4. duration of action - 2 hours
5. duration of action - 6 hours

30. Drugs which increase heart rate and contractibility:
1. Salbutamolum
2. Adrenalini hydrochloridum
3. Mesatonum
4. Galazolinum
5. Isadrinum

31. Pharmacological effects of Dobutaminum:
1. vasoconstrictive action
2. broncholytic action
3. cardiotonic
4. hypotensive
5. enhances blood circulation

32. α-adrenomimetics are effective in the case of rhinitis because of:
1. vessel dilatation
2. vasoconstriction
3. antimicrobial action
4. anti-edematous action
5. antihistamine action

33. Which of the following drugs have tocolytic action?
1. Mesatonum
2. Phenoterolum
3. Galazolinum
4. Dobutaminum
5. Noradrenalinum
6. Salbutamolum

34. Indications for prescription of dobutaminum:
1. Tachycardia
2. cardiac failure
3. bradycardia
4. atrioventricular block

35. For prevention of abortion are used:

1. Dobutaminum
2. Ephedrini hydrochloridum
3. Salbutamolum
4. Galazolinum
5. Phenoterolum

36. Side effects of Dobutaminum:
1. bradycardia
2. tachycardia
3. a rise in blood pressure
4. hypotension
5. arrhythmia

37. Side effects of adrenalinum:
1. arrhythmias
2. an increase in oxygen consumption by myocardium
3. tachycardia
4. bradycardia
5. hyperpotassemia
6. hypoglycemia

38. Side effects of Ephedrinum:
1. euphoria
2. insomnia
3. hypertension
4. addiction
5. tachycardia
6. bradycardia
7. collapse

39. Local anesthetics are employed simultaneously with adrenomimetics to:
1. increase blood pressure
2. increase absorption
3. decrease resorption
4. lengthen effect
5. decrease resorptive effect

1. Sympatholytics are:
1. Phentolaminum
2. Reserpinum
3. Dihydroergotaminum
4. Methyldopha

5. Propranololumum
6. Ephedrinum

2. Propranololumum:
1. selectively blocks beta-1-adrenoreceptors in the heart
2. causes bronchodilation
3. delays conduction in the myocardium
4. blocks beta-2-adrnoreceptors and beta-1-adrnoreceptors
5. causes bronchoconstriction
6. causes cancellation syndrome

3. α-adrenoblockers are indicated in the case of:
1. Raynaud's disease
2. pheochromocytoma
3. hypertensic crisis
4. collapse
5. glaucoma
6. angina pectoris

4. Sympatholytics:
1. cause an increase in blood pressure
2. cause a decrease in blood pressure
3. act on the postsynaptic receptors
4. block α-adrenoreceptors
5. block β-adrnoreceptors
6. upset the synthesis, storage, release of norepinephrine

5. Adverse effects resulting from administration of the Propranololumum:
1. blood hypertension
2. atony of the intestines
3. atrioventrycular blockade
4. bronchospasm
5. bradycardia
6. tocolytic effect (inhibition of the myometrium contractile ability)

6. Choose α-adrenoblockers:
1. Doxazosinum
2. Phentolaminum
3. Reserpinum
4. Metoprololumum
5. Anaprilinum
6. Prazosinum

7. α-adrenoblockers:
1. are antagonists of Isadrinum
2. are antagonists of Noradrenalini hydrochloridum
3. decrease blood pressure
4. are used in the case of angiospasm
5. are used in the case of arterial hypotension
6. dilates bronchi

8. Choose β-adrenoblockers:
1. Prazosinum
2. Phentolaminum
3. Atenololumum
4. Fenoterolum
5. Propranololumum
6. Metoprololumum

9. Contraindications for administration of Propranololumum:
1. hypertension
2. psychic excitement
3. bronchospasm
4. acute cardiac insufficiency
5. renal hypertension
6. tachycardia

10. Sympatholytics are:
1. Phentolaminum
2. Reserpinum
3. Salbutamolum
4. Propranololum
5. Methyldopa
6. Atenololumum

11. Prazosinum:
1. β-adrenomimetic
2. α, β-adrenomimetic
3. selective α-adrenomimetic
4. decreases blood pressure
5. sympatholytics

12. Propranololumum:
1. nonselective β-adrenoblocker

2. is effective in the case of angina pectoris
3. decreases heart rate and contractibility
4. is a broncholytic
5. may cause bronchospasm
6. stimulates contractibility

13. Atenololumum:
1. selective β1-adrenoblocker
2. nonselective β-adrenomimetic
3. is employed in hypertensive patients
4. increases blood pressure
5. decreases excitability of myocardium

14. Reserpinum:
1. Adrenomimetic
2. an antiadrenergic (sympatholytic) drug
3. indirect sympathomimetic
4. sympatholytic

15. Indications for administration of prazosinum:
1. hypertension
2. heart failure
3. hypotension
4. arrhythmia
5. bronchial asthma
6. angina pectoris

16. Side effects of prazosinum:
1. headache
2. orthostatic hypotension
3. pain in the heart
4. hypertension
5. drowsiness
6. tachycardia

17. Selective β-adrenoblockers:
1. Anaprilinum
2. Talinololum
3. Salbutamolum
4. Metoprololumum
5. Atenololum

18. Indications for administration of anaprilinum (propranololumum):
1. hypertension
2. heart block
3. tachyarrhythmia
4. extrasystole
5. angina pectoris
6. bronchospasm

19. Pharmacological effects of α-adrenoblockers:
1. hypertension
2. a decrease of contractibility
3. a decrease of oxygen consumption
4. hypotension
5. antiarrhythmic action
6. broncholytic action
7. tocolytic action

20. Pharmacologic effects of α-adrenoblockers:
1. constriction of peripheric vessels and hypertension
2. dilatation of peripheric vessels and hypotension
3. bronchospasm
4. enhancement of blood circulation and trophism
5. depression of peristalsis
6. a decrease in prostate muscles tonus

21. Contraindications for administration of β-adrenoblockers
1. hypertension
2. hypotension
3. angina pectoris
4. bradycardia
5. bronchial asthma

22. Propranololumum is:
1. β-adrenoblocker
2. hypotensive drug
3. selective α-adrenomimetic
4. causes vasodilatation
5. sympatholytic

P. W. 10.

Theme:

General anaesthetics. Pharmacology and toxicology of ethyl alcohol.

General questions:

1. History and characteristics of general anaesthesia. Classification of general anaesthetics.
2. The stages and kinds of anaesthesia. Inhaled general anaesthetics. Comparative characteristics, adverse effects.
3. Influence of the inhaled general anaesthetics on the cardiovascular system, respiration, metabolism, thermoregulation.
4. The conception of "breadth of therapeutic action".
5. Pharmacology of non-inhaled anaesthetics. Classification according to their duration of action. Comparative characteristics.
6. The conception of "basis", "combined" and "potentiated anaesthesia", "neuroleptanaesthesia", "tranquilanaesthesia".
7. Ethyl Alcohol (Ethanol, Spiritus Aethylicus). Pharmacology and toxicology, clinical use.
8. Acute and chronic poisoning (alcoholism) with ethanol, its treatment. Principles of pharmacotherapy of alcoholism. The mechanism of action of Teturame (Disulfirame).

Classification of General Anaesthetics

I. Inhaled Anaesthetics:
  1. Fluid Volatile agents:
     - Aether pro narcosi
     - Phthorothanum (Halothanum)
     - Isofluran
     - Eufluran
  2. Casiform agents:
     - Nitrogenium oxydulatum

II. Intravenous (non-inhaled) general anaesthetics:
  1. Short acting (ad 15 min.):
     - Propanididum (Sombrevinum)
     - Ketaminum (Ketolar, Kalipsol)
  2. Medium acting (20-30 min.)
     - Thiopentalum-natrium (Pentothalum)
     - Hexenalum
  3. Long-acting:
     - Natrii oxybutiras

Home task on prescription:

Prescribe:

1. Aeter pro narcosi in vial.
2. Thiopentalum-natrium for intravenous injection.
3. Natrii oxybutiras in ampoules.
4. Isofluranum for anesthesia.
5. Spiritus Aethylicus for treatment of operation area.

Study Questions (repeat physiology of Central Nervous System)

1. The neurotransmitter serotonin is derived from which precursor aminoacid?

A. Dopamine
B. Tyrosine
C. Tryptophan
D. Dopa
E. Glutamine

2. The major inhibitory neurotransmitter in the mammalian CNS is:

A. Acetylcholine
B. Norepinephrine
C. Glycine
D. γ-Aminobutyric acid
E. Glutamic acid

3. The location of the blood-brain barrier is considered to be:

A. At the level of the brain capillaries
B. At the level of glia
C. At the level of neurons
D. At the level of dendrites

4. Identify the major excitatory neurotransmitter system in the mammalian CNS:

A. γ-Aminobutyric acid
B. Histamine
C. Substance P
D. Glutamate/aspartate
E. Serotonin

5. Agents that potentiate the actions of GABA in the brain will likely have which of the following effects?

A. Elevate blood pressure
B. Provide sedation
C. Cause seizures

D. Relieve pain

CASE STUDY

A 77-year-old man is admitted to the hospital for a coronary artery by-pass. He has been treated with a β-blocker, which he took every morning. He is induced with propofol 1 mg/kg, fentanyl 5 μg/kg and vecuronium 8 mg for muscle relaxation. After 3 minutes a decreasing heart rate becomes a worry for the anesthesiologist. The heart rate continues to fall until it reaches 38 BPM. At this point the patient's blood pressure is 80/60 and the anesthesiologist gives atropine 0,4 mg and ephedrine 10 mg. This treatment results in a stable patient. What effects were most likely produced by the anesthesia procedure? Could this have been avoided?

Educational research work.

Assignment 1.

Prescribe:

1. Propanididum (Sombrevine) in ampoules.
2. Ketaminum for intravenous injection.
3. Solution of Natrii oxybutiras as hypnotic drug.
4. Disulfiramum in tablets.
5. Spiritus aethylicus for desinfection of instruments.

Assignment 2.

Pharmaco-therapeutical task:

1. Drug for short-lasting initial anaesthesia.
2. Drug used in hypoxic brain edema.
3. Drug for short surgical procedure.
4. Drug for anaesthesia by intravenous and rectal administration.
5. Drugs for inducing of general anaesthesia.
6. Gasiform agents for anaesthesia.
7. Drug to treat alcoholism and manage chronic alcoholism.
8. Drug which has sulphur in its structure.
9. Short acting general anaestetics.
10. General anaestetic which doesn’n have myorelaxant effect.

Assignment 3. *Individual work: fill in the tables.*

Drugs	Dosage form	Indication to use
I. Inhaled anaesthetics: II.Non-inhaled anaesthetics: III. Spiritus aethylicus:		

Pharmacological effects	Agents for correction (or treatment)
1.Acute poisoning with ethyl alcohol: 2. Chronic poisoning with ethyl alcohol.	

Assignment 4.

*Choose **one** correct answer:*

1. During the operation on gall-bladder ether pro narcosi was used for anesthesia and was injected after primary non-inhalation narcosis (thiopentalum-natrium). What type of interaction is observed in this case?
A. Non-competitive antagonism
B. Potential synergism
C. Competitive antagonism
D. Additive synergism
E. Autonomous antagonism

2. For the conduction of surgical operation in case of acute phlegmonous appendicitis the doctor injected the patient with the drug from general anesthetics group which has durable excitation action. What drug the patient was injected with?
A. Enfluranum
B. Nitrous oxide
C. Phthorothanum
D. Propanididum
E. Natrii oxybutiras

3. Indicate the drug which has sedative, anesthetic, narcotic, antihypoxic, myorelaxant action which is used in anesthesia and sleep disturbance treatment.
A. Hexenalum
B. Natrii oxybutiras
C. Chlorali hydras
D. Thiopentalum-natrium
E. Diazepamum

4. A patient was intravenously injected the fast-acting drug (the start of action in 1 minute) in order to relieve the pain during biopsy which caused the narcosis for 5 minutes. During anesthesia spontaneous movements, slight decreasing of arterial pressure, short-term breath-stop appeared which soon was recommenced. What drug was used?
A. Chlorali hydras

B. Natrii oxybutiras
C. Propanididum
D. Ketaminum
E. Phthorothanum

5. For faster injection into patient's narcosis it was used such combination: ether pro narcosi + nitrous oxide + phthorothanum. Indicate the type of medicinal agents interaction.
A. Synergo-antagonism
B. Potential synergism
C. Summing synergism
D. Physical antagonism
E. Direct synergism

6. After second surgical operation with the use of the same general anesthetic a patient had acute liver damage (hepatitis). Which general anesthetic probably may cause such pathology?
A. Nitrous oxide
B. Thiopentalum-natrium
C. Phthorothanum
D. Propanididum
E. Ether pro narcosi

7. For anaesthetization a burn department patient was injected intravenously the drug for non-inhalation short-term narcosis. In a minute after drug injection the patient was in anesthetic state and had such symptoms: increasing of arterial pressure, skeleton muscles tone, tachycardia. The reflexes were saved. After ending of anesthesia the patient was observed with disorientation, eye hallucinations. What drug the patient was injected with?
A. Thiopentalum-natrium
B. Sombrevinum
C. Ketaminum
D. Ether pro narcosi
E. Nitrous oxide

8. A patient was intravenously injected with thiopentalum-natrium for introductory narcosis, after that bronchospasm appeared, salivation increased. The injection of what drug might prevent the undesirable effects?
A. Adrenalini hydrochloridum
B. Atropini sulfas
C. Proserinum
D. Dithylinum

E. Propranololum

9. During surgical operation for general anesthesia the combination of inhalation anesthetic and barbiturate acid derivative was used. Find this combination.
A. Promedolum + phthorothanum
B. Nitrous oxide + ketaminum
C. Thiopentalum-natrium + phthorothanum
D. Phthorothanum + phentanylum
E. Droperidolum

10. A 40-years-old patient was under inhalation anesthesia with the help of volatile fluid. Narcosis began in 5 minutes after inhalation without excitation phase. During anesthesia decreasing of arterial pressure, bradycardia were observed. Awakening after narcosis was quick without post-operational depression. What narcotic agent was used?
A. Phthorothanum
B. Ether pro narcosi
C. Nitrous oxide
D. Sombrevinum
E. Hexenalum

11. Surgeon-dentist made patient's tooth extraction under general anesthesia. Which of the mentioned agents may be used for narcosis in this case?
A. Thiopentalum-natrium
B. Ether pro narcosi
C. Isofluranum
D. Phthorothanum
E. Nitrous oxide

12. For general anesthesia injection the doctor-anesthesiologist prescribed narcotic agent propanididum to the patient. What duration of drug action?
A. 3 - 5 m.
B. 20 - 30 m.
C. 40 - 60 m.
D. 1,5 - 2 h.
E. 30-40 s.

13. During surgical operation for general anesthesia the combination of inhalation anesthetic and barbiturate acid derivative was used. Find this combination.
A. Nitrous oxide + ketaminum
B. Promedolum + phthorothanum
C. Phthorothanum + phentanylum

D. Thiopentalum-natrium + phthorothanum
E. Droperidolum + ether pro narcosi

14. After second surgical operation with the use of the same general anesthetic a patient had acute liver damage (hepatitis). Which general anesthetic probably may cause such pathology?
A. Natrii oxybutiras
B. Nitrous oxide
C. Phthorothanum
D. Propanididum
E. Ether pro narcosi

15. A 28-years-old woman went to the dentist in the question of making dentures. As she had an allergy on local anesthetics teeth treatment should be made under general anesthesia. Which drug should be used in this case taking into consideration short-term manipulation (under 5 minutes)?
A. Hexenalum
B. Ketaminum
C. Propanididum
D. Natrii oxybutiras
E. Thiopentalum-natrium

16. To minimize the surgical operation fear ataractanalgesia was conducted to a patient. Drugs of which pharmacological groups should be used in this manipulation?
A. Tranquillizers + narcotic analgesics
B. Tranquillizers + neuroleptics
C. Tranquillizers + narcotic agents
D. Narcotic analgesics + neuroleptics
E. Narcotic analgesics + narcotic agents

17. During anesthesia with thiopentalum-natrium a patient had low arterial pressure and suppressed breathing. What first-aid agent should be used in this case?
A. Alloximum
B. Dipiroximum
C. Naloxoni hydrochloridum
D. Coffeinum-natrii benzoas
E. Nalorphini hydrochloridum

18. Before the operation with ether narcosis it is necessary to decrease bronchial glands secretion and prevent bronchospasm which may appear as a result

of ether damage action. Drug of which pharmacological group should be prescribed to patient?
A. M-cholinoblockers
B. N-cholinomimetics
C. N-cholinolitics
D. M-cholinomimetics
E. M, N-cholinomimetics

19. The man is kept under the dispensary observation in psychoneurological clinic for chronic alcoholism. Abuse of alcohol has led to acute psychosis. What drug can be expediently used?
A. Hygronium.
B. Atropini sulfas.
C. Pentaminum.
D. Aminazinum.
E. Adrenalini hydrochloridum.

20. Receiving a routine treatment by metronidazole the patient has taken a small amount of alcohol due to which a severe poisoning has developed. What is the cause of a poisoning?
A. Allergic reaction.
B. Accumulation of acetaldegide.
C. Neurologic frustration.
D. Cardiovascular insufficiency.
E. Disorder of kidneys function.

Assignment 5.
*Choose **all** correct answers:*

1. Stage of anesthesia is characterized by:
1. a decreased awareness of pain
2. loss of consciousness
3. delirium and violent combative behavior
4. consciousness
5. reflexes are preserved
6. convulsions

2. Choose volatile substances for inhalational anesthesia:
1. Enfluranum
2. Nitrogenium oxydulatum
3. Ketaminum
4. Phthorothanum

5. Isofluranum
6. Propanididum

3. Natrii oxybutyras:
1. is an inhalation anesthetic
2. is a derivative of barbituric acid
3. is similar to GABA
4. readily penetrates through hematoencephalic barrier
5. is administered only intravenously
6. is a non-inhalation anesthetic

4. Choose drugs which allow to lower dose of anesthetics:
1. CNS stimulants
2. muscle (neuromuscular) relaxants
3. tranquilizers
4. M-cholinomimetics
5. neuroleptics
6. opioid analgesics

5. Surgical anesthesia is characterized by:
1. inhibition of sensitivity
2. cardiac arrest
3. suspension of the renal filtration
4. loss of consciousness
5. relaxation of the skeletal muscles
6. hypertonicity of the skeletal muscles

6. Choose agents for inhalational narcosis:
1. Propanididum
2. Enfluranum
3. Aether pro narcosi
4. Thiopentalum natrium
5. Phthorothanum
6. Natrii oxybutyras

7. Derivatives of the barbituric acid:
1. Natrii oxybutyras
2. Ketaminum
3. Thiopentalum natrium
4. Propanididum
5. Xenonum
6. Aether pro narcosi

8. For potentiation of narcosis these drugs are used:
1. analeptics
2. muscle (neuromuscular) relaxants
3. neuroleptics
4. adrenomimetics
5. tranquilizers
6. M-cholinoblockers

9. Anesthetics:
1. render unconscious
2. depress reflexes
3. selectively depress some centers
4. doesn't influence muscle tone
5. depress sensitivity
6. employed in the case of alcohol poisoning

10. Narcosis is characterized by:
1. unconsciousness
2. increased muscle tone
3. depressed reflexes
4. decreased muscle tone
5. stimulation of the spinal reflexes
6. insensitivity

11. First stage of narcosis is characterized by:
1. consciousness
2. decreased pain sensitivity
3. decreased muscle tone
4. areflexia
5. sharp decline in the touch sensitivity
6. muscle tone is preserved

12. All anesthetics have in common:
1. disturbance in the synapse transmission
2. increased concentration of noradrenalin in the brain
3. disturbance of the membrane permeability in neurons
4. they all have excitement stage
5. irritation of the upper airways

13. Anesthetic drugs requirements:
1. sufficient breadth of the narcosis

2. quick development of the stage IV
3. anesthetics shall cause all stages of anesthesia
4. good manageability
5. quick development of the narcosis
6. ability to decrease blood pressure
7. absence of excitation stage

14. Advantages of the intravenous narcosis:
1. absence of excitation stage
2. quick development of narcosis
3. it can be used in outpatients
4. good manageability
5. excitation stage

15. Disadvantages of the intravenous narcosis:
1. poor manageability
2. quick development of the narcosis
3. good manageability
4. prominent stage II
5. poor muscle relaxation

16. Choose agents for inhalational anesthesia:
1. Propanididum
2. Enfluranum
3. Diethyl ether
4. Thiopentalum natrium
5. Phthorothanum
6. Natrii oxybutyras

17. Which of the following are used for inhalational anesthesia?
1. Enfluranum
2. Thiopentalum natrium
3. Phthorothanum
4. Nitrogenium oxydulatum
5. Ketaminum
6. Natrii oxybutyras

18. Aether pro narcosi is characterized by:
1. significant breadth of the narcosis
2. excitement stage
3. absence of the excitation stage
4. serious damage of the parenchymatous organs

5. irritation of the upper airways
6. inflammability and explosiveness

19. Phthorothanum:
1. provides quick development of narcosis
2. causes pronounced excitation stage
3. administered intravenously
4. is a volatile agent
5. significantly decreases blood pressure
6. increases blood pressure

20. Nitrogenium oxydulatum:
1. is a gaseous substance
2. employed in minor operations
3. causes significant irritation
4. is a highly active anesthetic agent
5. is not very active
6. causes prolonged excitation stage

21. Nitrogenium oxydulatum is characterized by:
1. high toxicity
2. pronounced excitation stage
3. low influence on the visceral organs
4. poor anesthetic activity
5. employed in mixture with oxygen

22. Choose intravenous anesthetics:
1. Propanididum
2. Natrii oxybutyras
3. Halothanum
4. Spiritus aethylicus
5. Thiopentalum natrium
6. Nitrogenium oxydulatum
7. Enfluranum

23. Choose intravenous barbiturate anesthetics:
1. Ketaminum
2. Propanididum
3. Natrii oxybutyras
4. Thiopentalum natrium
5. Phenobarbitalum

24. Choose intravenous anesthetic agents:
1. Nitrogenium oxydulatum
2. Phthorothanum
3. Propanididum
4. Ketaminum
5. Enfluranum

25. Agents for ultra-shot narcosis (10 min):
1. Thiopentalum natrium
2. Propanididum
3. Ketaminum
4. Hexenalum
5. Natrii oxybutyras

26. Choose special features of the narcosis rendered by propanididum:
1. prolonged excitation stage
2. narcosis develops during 15-20 min
3. duration of the stage III - 2-3 h
4. duration of narcosis - 3-5 min
5. slow (about 30 min) discontinuation of narcosis

27. Which of the following are barbituric acid derivatives?
1. Natrii oxybutyras
2. Ketaminum
3. Thiopentalum natrium
4. Propanididum
5. Hexenalum

28. Thiopentalum natrium:
1. administered intravenously
2. may cause apnea and collapse
3. administered orally
4. duration of action 2-3 min
5. duration of action 20-25 min
6. administered in inhalationaly

29. Thiopentalum natrium:
1. is a barbituric acid derivative
2. has a hypnotic action
3. administered intravenously lowly
4. administered in inhalation
5. acts during hours

6. is a gaseous substance

30. Natrii oxybutyras:
1. is a short acting agent
2. is a long acting agent
3. used as a sedative and hypnotic
4. has antihypoxic action
5. causes narcosis continuing for 3-5 min
6. causes pronounced excitation stage

31. Natrii oxybutyras:
1. causes CNS excitation
2. is a derivative of barbituric acid
3. structurally similar to GABA
4. readily penetrates blood-brain barrier
5. administered only intravenously

32. Natrii oxybutyras has following properties:
1. sedative
2. muscle relaxating
3. ganglion blocking
4. hypnotic
5. anesthetic
6. antihypoxic action
7. irritative

33. Which of the following drugs could decrease dosage of anesthetic agents?
1. Exciting CNS
2. muscle relaxant
3. tranquilizers
4. m-cholinomimetics
5. neuroleptics
6. opioids
7. analeptics
8. psychostimulant

34. General action of spiritus aethylicus is:
1. depression of CNS
2. diuretic action
3. excites brain cortex
4. inactivates hepar enzymes
5. decreases gastric secretion

35. Spiritus aethylicus exerts such general effects as:
1. mental dependency
2. addiction
3. may cause alcoholism
4. an increase of IQ
5. increases capacity for work
6. increases attentiveness

36. Spiritus aethylicus being used topically:
1. may cause habituation
2. exerts antimicrobial action
3. exerts irritative action
4. causes protein coagulation
5. causes anesthetic action
6. depresses regeneration

37. Teturamum:
1. causes storage of acetaldehyde
2. enhances excretion of alcohol
3. is given to outpatients
4. is used for treatment of alcoholism
5. is used as an emetic drug

38. In the case of alcohol poisoning we shall:
1. give the patient CNS stimulants
2. make gastric lavage
3. administer inotropic drugs
4. administer muscle relaxants
5. administer opioid drugs
6. administer hypotensive drugs

39. Spiritus aethylicus:
1. causes dilatation of the skin vessels
2. rises body temperature
3. helps to get warm in cold temperature
4. may cause supercooling in cold temperature
5. increases heart performance
6. stimulates breathing
7. exerts anesthetic action

40. Teturamum mechanism of action:

1. depresses aldehyde dehydrogenase
2. depresses cytochrome system
3. neutralizes alcohol in the stomach
4. enhances alcohol combustion in the body
5. slows down spiritus oxidation

41. In medical practice spiritus aethylicus is used as:
1. antiseptic
2. irritative agent
3. antishock agent
4. antacid agent
5. agent causing necrosis
6. CNS stimulator

42. Administration of spiritus aethylicus causes following effects:
1. analeptic
2. broncholytic
3. antimicrobial
4. anti-inflammatory
5. irritative
6. narcotic

43. Administration of spiritus aethylicus causes:
1. decreased attentiveness
2. depression of the inhibitory processes in the brain
3. decreased conditional reflex
4. enhances conditional reflex
5. increases attentiveness

P. W. 11.
Theme:
Hypnotic drugs. Antiepileptic and antiparkinsonism drugs.

General questions:
1. Classification of hypnotic drugs. Pharmacodynamics and pharmacokinetics of hypnotic agents.
2. Therapeutic uses and adverse effects of hypnotic drugs.
3. Acute poisoning with hypnotic agents and measures of medical aid for it.
4. Classification of antiepileptic drugs. Mechanism of action, efficiency in treatment of various forms of epilepsy. Therapeutic use and adverse effects.
5. Drugs used in treatment of "Parkinsonism". Classification of antiparkinsonism drugs, mechanism of action, characteristic of the drugs, their adverse effects.

Classification of Hypnotic drugs

I. Hypnotics with narcotic type of action:
1. Barbiturates:
- Phenobarbitalum (Luminalum)
- Aethaminalum-natrium (Pentabarbitalum, Nembutalum)
- Zolpidem (Ivadal)
- Zopiclone (Imovan)

2. Aliphatic compounds:
- Chloral hydrate
- Bromizovalum

II. Hypnotics with non-narcotic effect type of action:
1. Benzodizepines:
- Nitrazepamum
- Diazepamum (Sibazonum, Seduxenum)
- Phenazepamum
- Chlordiazpoxidum (Elenium, Chlozepide);
- Nozepamum

2. Cyclopyrrolidones derivatives:
- Zopiclonum (Imovan)

3. Imidazopyrrolidines:
- Zolpidemum (Ivadal)

4. Aethanolamines derivatives:
- Donormile

5. Agents from other chemical groups:
- Novo-passite
- Colvaldine

Classification of Antiepileptic drugs

1. Agents for treatment of generalized tonic-clonic condition (grand mal):
    - Phenobarbitalum
    - Dipheninum
    - Clonazepamum
    - Carbamazepinum
2. Agents for treatment of slight tonic-clonic condition (petit mal):
    - Ethosuximidum
    - Natrii valproas
    - Lamatriginum (Lamictal)
3. Agents for treatment of myoclonic seizures or “status epilepticus”:
    - Diazepamum
    - Nitrazepamum
    - Natrii valproas

Classification of Antiparkinsonism drugs

I. Drugs activating dophaminergic system:
1. Precursors of dopamine:
    - Levodopum
    - Nacom (Levodopum+Carbidopum)
2. Dophaminomimetics:
    - Bromoniphinum
    - Pramipexolum
3. Inhibitors of MAO:
    - Selegellinum

II. Drugs inhibiting glutamatergic system:
    - Amantadinum (Midantanum)

III. Drugs inhibiting cholinergic influences:
    - Cyclodolum
    - Tropacinum
    - Brinerdinum

Home task on prescription:

Prescribe:

1. Zolpidemum in tablets.
2. Donormile in tablets.
3. Levodopum in capsules.
4. Dipheninum in tablets.
5. Ethosuximidum in vials.
6. Natrii valproas in capsules.

CASE STUDY

1. M. W., a 22 y.o. woman, visits her doctor because she is extremely tired. She reports that although she is exhausted at bedtime, she typically cannot fall asleep for at least an hour or two. She moved to town 2 months ago and has her first full-time job. She likes her job but fears that her supervisors think she is "dumb" because she has made some careless mistakes. After falling to sleep, she sometimes wakes an hour or more before her alarm goes off, usually thinking about her dumb mistakes. Her problems with sleeping began approximately 5 months ago, when she was studying for final examinations in her senior year of college. Aside from a minor dermatological condition, she is in excellent health. What treatment would you recommend for her insomnia and fatigue?
2. M. S., a 60 y.o. architect, designs buildings. His drawings are very detailed and they must be drawn to a specific scale. During the past month he has developed a slight tremor in his right hand that causes some embarrassment but does not interfere with function. He has, however, noticed that his writing and drawing have gotten much smaller, causing problems with his work. His primary care physician has referred him to a neurologist for evaluation. On examination, the neurologist notes some motor rigidity in the right arm. He also observes a slight slowing in the patient's walk and a reduction in the swing of his arms as he walks. What is the diagnosis, and how should the patient be treated?
3. A 28-year-old woman you have been treating for a seizure disorder tells you that she is 2 months pregnant and thought you should know about it. She has exhibited absence seizures in the past, but currently her episodes are generalized tonic-clonic. She usually has two or three generalized seizures per month. She indicates that she has had only one episode during the past 2 months and wonders if she should stop her medication. She is taking oxcarbazepine, valproic acid, and ethosuximide. Are any of the agents that the patient is taking clearly more teratogenic than others? Is there any significance to the apparent decreased incidence of seizures during pregnancy? How would you propose treating this patient?

Educational research work

Assignment 1.

Prescribe:

1. Nitrazepamum in tablets.
2. Nacomum in tablets.
3. Diazepamum in ampoules.
4. Zopiclonum in tablets.
5. Lamotriginum in tablets.

Assignment 2.

Pharmaco-therapeutical task:

1. A hypnotic drug from the group of barbiturates.
2. Hypnotic drugs from the group of tranquillizers.
3. A drug for control of status epilepticus.
4. An agent of barbiturates for treatment of epilepsy.
5. An antiparkinsonic agent affecting the dopaminergic processes in the CNS.
6. A cholinoblocker for treatment of parkinsonism.
7. Agents for treatment of generalized tonic-clonic conditions.
8. Precursor of dopamine.
9. Drugs inhibiting glutamatergic system.
10. Drugs for treatment slight tonic-clonic conditions.

Assignment 3.

Individual work: fill in the table.

Drugs	Dosage form	Indication to use
1. Hypnotic drugs with narcotic effect: 2. Hypnotic drugs from the group of tranquilazes: 3.Antiepileptic drugs: 4. Antiparkinsonismic drugs:		

Assignment 4.

*Choose **one** correct answer:*

1. The patient, 18 years old, came to the doctor with complaints of dream violation, sensation of sleepiness, morning weariness, decrease in intellectual work capacity. The doctor has established, that the sleeplessness is connected with neurosis-like condition. What sleeping drug is rational for appointing in that case?

A. Phenobarbitalum.
B. Bromizovalum.
C. Chorali hydras.
D. Nitrazepamum.
E. Ethaminalum -natrium.

2. The man, 58 years old, has come to the doctor with complaints of trembling, akynesia, rigidity of the muscles. The doctor has diagnosed Parkinson's disease. This patient also suffers from glaucoma. What is necessary to be appointed?

A. Cyclodolum.

B. Levodopa.
C. Atropini sulfas.
D. Scopolamini hydrobromidum.
E. Methacinum.

3. Prescribe the patient complaining of sleeplessness the modern sleeping draughts, which is an imidopyridinum derivative and influences on benzodiazepine receptors in the CNS, does not violate the structure of sleep, does not lead to dependence, does not change activity of the liver enzymes. What is it?
A. Calcii chloridum.
B. Chlorali hydras.
C. Nitrazepamum.
D. Zolpidemum.
E. Phenobarbitalum.

4. The man, 70 years old, with Parkinson's disease has been appointed a drug 'levodopa'. In a week the condition of the patient has considerably improved. What is the mechanism of this drug action?
A. Activation of dophaminergic receptors.
B. Depression of cholinergic receptors.
C. Depression of gistaminergic receptors.
D. Depression of serotoninergic receptors.
E. Activation opiate receptors.

5. The 5- year-old child, periodically experiences convulsive attacks with loss of consciousness. The doctor diagnosed epilepsy (generalised tonic-clonic). What drug is recomended to this child?
A. Levodopa.
B. Cyclodolum.
C. Ethosuximidum.
D. Phenobarbitalum.
E. Amizilum.

6. To anaesthetize the manipulation related to burn surface treatment, a patient was IV injected a medication for short-acting narcosis. 1 minute later the patient being under anaesthesia had increased BP, tachycardia, increased tone of skeletal muscles; reflexes are remained. After awakening the patient had disorientation and visual hallucination. What medication was the patient injected?
A. Natrii oxybutiras.
B. Thiopentalum natrium.
C. Aether pro narcosi.
D. Isofluran.

E. Ketaminum.

7. A patient after automobile accident was delivered into the traumatological clinic. In connection with spleen rupture and internal bleeding it was decided to make urgent surgical operation under Phtorotan anaesthesia. But as a result of haemorrhagic shock caused by the bleeding, the BP was progressively falling. Choose an adrenomimetic for normalisation of the BP:
A. Salbutamolum.
B. Noradrenalini hydrochloridum.
C. Mesatonum.
D. Ephedrini hydrochloridum.
E. Isadrinum.

8. Drug of choice in status epilepticus is:
A. Diazepamum.
B. Ethosuximidum.
C. Natrii valproas.
D. Carbamazepinum.
E. Levodopa

9. Drug, which decreases exciting neurotransmitter amino acids (glutamate, aspartate) level in brain:
A. Diazepamum.
B. Phenobarbitalum.
C. Lamotriginum.
D. Natrii valproas.
E. Carbamazepinum.

10. A patient after cranial trauma was delivered into the neurological clinic. Progressive increase of neurological symptoms allowed making the diagnoses of brain contusion, which became the reason of increasing oedema of brain followed by hypoxia of its structures. Administer to the patient a general anaesthetic, which exerts beneficial influence in brain hypoxia:
A. Propanididum.
B. Thiopentalum natrium.
C. Isofluran.
D. Natrii oxybutiras.
E. Ketaminum.

11. A patient with epilepsy was recommended a medicine known as a derivative of dipropilacetic acid that inhibits GABA-transferase and increases GABA

level in the brain; inhibits excitability and seizure capability of motor zone of the CNS. It can be used for all types of epilepsy. Indicate this medicine:
A. Lamotriginum
B. Diazepamum (Seduxen)
C. Dipheninum
D. Natrii bromidum
E. Natrii valproas

12. Administer a drug that belongs to modern hypnotics to the patient with insomnia. It is an imidazopyridine derivative; activates benzodiazepine receptors in the CNS; does not alter either sleep structure or activity of liver enzymes, does not cause dependence:
A. Droperidolum
B. Nitrazepamum
C. Zolpidemum
D. Chlorali hydras
E. Flumazenilum

13. What phenomena may be developed in long taking of barbiturates?
A. Drug tolerance
B. Drug dependence
C. Extrapyramidal syndrome
D. Sensibilization
E. Inhibition of enzymes of liver

14. The patient has appealed to the dentist with complaints of hypertrophy and pain in the gums. After examination of the oral cavity the doctor has diagnosed hyper plastic gingivitis. It has been established from the anamnesis, that the patient has been taking for a long time an antiepileptic agent. Specify this drug.
A. Dipheninum
B. Hexamidinum
C. Phenobarbitalum
D. Carbamazepinum
E. Trimethinum

15. A 57 y.o. man in a coma has been delivered to hospital. It is known from his anamnesis that he suffered from insomnia. At inspection the following is revealed: respiratory depression, fallen AP, progressing cardiac weakness, decrease of body t^{o}, inhibition of tendon reflexes. What drug could cause poisoning?
A. Fluoxetinum
B. Phenobarbitalum

C. Tinctura Valerianae
D. Levodopa
E. Natrii bromidum

16. A woman after the experienced nervous shock sleeps badly. What agent should be administered?
A. Fluoxetinum
B. Phenobarbitalum
C. Nitrazepamum
D. Aminazinum
E. Natrii bromidum

17. Diphenin has been administered to a patient to treat epilepsy with tonic-clonic attacks. What is the action mechanism of the drug?
A. Activation of GABA system
B. Blockade of Ca^{2+} channels
C. Stimulation of dopamine receptors
D. Blockade of dopamine receptors
E. Blockade of Na^{+} channels

18. A patient with epilepsy was recommended a medicine known as a derivative of dipropylacetic acid that inhibits GABA-transferase and increases GABA level in the brain; inhibits excitability and seizure capability of motor zone of the CNS. It can be used for all types of epilepsy. Name this agent.
A. Diazepamum
B. Natrii valproas
C. Natrii bromidum
D. Lamotriginum
E. Dipheninum

19. The patient suffering with parkinsonism has been taking for a long time the agent with central cholinolytic action mechanism which efficiency has gradually decreased. Indicate drug which should be administered instead of used one?
A. Cyclodolum
B. Levodopa
C. Mydocalm
D. Tropacinum
E. Bellataminalum

20. A 76 y.o. patient has appealed to the doctor with complaints of superficial short-term sleep with often awakenings caused by sense of internal tension,

anxiety, fear. Senile sleeplessness was diagnosed. Make a rational choice of a hypnotic in the given situation:
A. Phenobarbitalum
B. Chlorali hydras
C. Nitrazepamum
D. Lamotriginum
E. Carbamazepinum

21. Indicate the character of changes in the structure of the sleep under the action of the hypnotic agents from the group of barbiturates:
A. Deepening of suppression of the CNS during UNREM sleep phase
B. Shortening of the latent period the first episode of the REM-sleep
C. Extention of REM-sleep (paradoxal) phase
D. Shortening of REM-sleep (paradoxal) phase
E. Lengthening of the duration of episodes of the REM-sleep

22. Symptoms of poisoning by derivative of barbituric acid are revealed in a patient. What drug can increase excretion of barbiturates from the organism?
A. Natrii chloridum
B. Natrii hydrocarbonas
C. Kalii chloridum
D. Magnesium oxide
E. Magnesii sulfas

23. Determine the hypnotic drug, which doesn't influence the structure of sleep.
A. Barbitalum
B. Phenobarbitalum
C. Nitrazepamum
D. Aethaminalum-natrium (pentobarbital)
E. Bromisovalum

24. The student asked the doctor to help him to overcome fear of the stomatologic manipulations. What drug has the doctor advised to take?
A. Pyracetamum.
B. Aminazinum
C. Droperidolum
D. Dimedrolum
E. Diazepamum

25. The patient developed the symptoms of Parkinson's disease after treatment for psychosis in mental clinic. What drug had been used for his treatment?
A. Lithii carbonas.

B. Mezapamum.
C. Natrii bromidum.
D. Aminazinum.
E. Nialamidum.

26. A dentist introduced sibazonum (diazepam) to a 47 y.o. woman before extraction of tooth. Indicate the anxiolytic action mechanism of the drug:
a. Stimulation of opioid receptors
b. Inhibition of dopamine receptors and adrenoceptors
c. Stimulation dopamine receptors and adrenoceptors
d. Agonist of benzodiazepine receptors
e. Inhibition of benzodiazepine receptors

27. A patient was addressed to a doctor with complaints of irritability, insomnia, fatigue. A doctor administered a sedative drug to him. In a week the patient began to complain of cough, sleepiness, decrease of memory, phenomena of rhinitis, conjunctivitis, dermatitis. Which group of the drugs was administered by the doctor?
A. Neuroleptics
B. Tranquilizers
C. Lithium
D. Bromides
E. Non-steroidal anti-inflammatory agents

28. A student asks a doctor to help him overcome fear before dental manipulation. What drug did the doctor recommend?
A. Pyracetamum
B. Aminazinum
C. Droperidolum
D. Diazepamum
E. Dimedrolum

29. Glutamate decarboxylation results in formation of inhibitory transmitter in CNS. Name it:
A. Serotonin
B. GABA
C. Glutathione
D. Histamine
E. Asparagines

30. Which anti-epileptic acts by prolongation of Na^+ channels inactivation as well as by inhibiting kindling? The drug also has antidiuretic action, probably by enhancing ADH action on renal tubules.
A. Carbamazepinum
B. Phenobarbitalum
C. Droperidolum
D. Natrii valproas
E. Ethosuximidum

31. Drug, which decreases exciting neurotransmitter amino acids (glutamate, aspartate) level in brain:
A. Diazepamum
B. Phenobarbitalum
C. Natrii valproas
D. Carbamazepinum
E. Lamotriginum

32. A major problem that must be faced when administering anticonvulsants with many other medications (including other antiepileptic drugs) involves drug interactions due to altered metabolism. Which of the following drugs is likely to cause excessive or toxic effects from some other drugs by inhibiting metabolism?
A. Ethosuximidum
B. Carbamazepinum
C. Phenobarbitalum
D. Dipheninum
E. Natrii valproas

33. The doctor has prescribed cyclodolum for Parkinson disease treatment. What is the mechanism of anti parkinsonian action of the drug?
A. M-cholinomimetic action
B. M-cholinoblocker action
C. Stimulation of dopamine receptors
D. Blockade of dopamine receptors
E. β-Adrenoblocking action

34. A patient of 58 year old has been taken phenobarbitalum in connection with insomnia. After a cancellation of the drug the patient again has difficulty in falling asleep, frequently wakes up at night; dreams is accompanied by dreadful dreams. What is the reason of the given undesirable effect of Phenobarbital?
A. Dependence
B. Idiosyncrasy

C. Tachyphylaxis
D. Rebound syndrome
E. Tolerance

35. A patent defied doctor's instructions and continued to use phenobarbital over 3 weeks. Meanwhile, he was forced to increase the drug's dose. How to explain falling of Phenobarbital efficacy?
A. Activation of lipolysis
B. Inhibition of monooxygenase systems of a liver
C. Induction of monooxygenase systems of a liver
D. Inhibition of lipolysis
E. Induction of glycolysis

36. A 56-year-old man with insomnia was given phenobarbitalum. The sleep was normalized. However, after 2 weeks the effect of Phenobarbital fell down. What reason caused decreasing of hypnotic action of Phenobarbital?[R]
A. It is poor solubility
B. Development of tolerance
C. Its poor absorption in stomach
D. Its fixation in lipids
E. Development of tachyphylaxis

Assignment 5.
*Choose **all** correct answers:*

1. Which drugs are used for treatment of the tonic-clonic (grand mal) seizures:
1. Phenobarbitalum
2. Dipheninum
3. Carbamazepinum
4. Propanididum
5. Ethosuximidum
6. Natrii valproas

2. Carbamazepinum:
1. prevents absence (petit mal) seizures
2. prevents tonic-clonic (grand mal) seizures
3. prevents psychomotor equivalents
4. is used for treatment of the trigeminal nerve neuritis
5. has an antiparkinsonian activity
6. is used as hypnotic

3. A drug that has simultaneously hypnotic and antiepileptic properties:
1. Cyclodolum
2. Dipheninum
3. Natrii valproas
4. Phenobarbitalum
5. Lamotriginum
6. Carbamazepinum

4. Mechanism of action of barbiturates includes:
1. inhibition of the central adrenoreceptors
2. conformation of the membranes of nerve cells and opening of the chlorine canals
3. hyperpolarization of membranes
4. block of GABA receptors
5. excitation of benzodiazepine receptors
6. excitation of barbiturate receptors

5. In the case of Parkinsonian disease these drugs are used:
1. central cholinergic antagonist (Cyclodolum)
2. drugs which block dophaminergic system (Aminazinum)
3. dophaminomimetic (Bromocriptinum, Pramipexolum)
4. indirect sympathomimetics (Ephedrini hydrochloridum)
5. inhibitors of the MAO A, B (Nialamidum)
6. precursors of dophamine (Levodopa)

6. Mechanisms of action of the antiepileptic drugs include:
1. a decrease of dophamine production
2. a decrease of GABA production
3. activation of the GABA system
4. a decrease of permeability of the sodium canals
5. an increase of the intracellular chloride ions
6. suppress repetitive action potentials in epileptic foci in the brain

7. Drugs used for prevention of the tonic-clonic (grand mal) seizures:
1. Phenobarbitalum
2. Dipheninum
3. Natrii valproas
4. Ethosuximidum
5. Carbamazepinum
6. Levodopa

8. Choose hypnotics:

1. Phenobarbitalum
2. Nitrazepamum
3. Carbamazepinum
4. Chlorali hydras
5. Zopiclon
6. Levodopa

9. In the case of continuous administration of Phenobarbitalum habituation develops via:
1. a decrease of absorption in the intestines
2. a decrease of receptor sensitivity
3. an increase of metabolism in the liver
4. production of the antibodies to the drug
5. induction of the microsomal enzymes in the liver
6. Cumulation in fat tissue

10. In response to administration of Cyclodolum such symptoms are developed:
1. Midriasis and an increase of intraocular pressure
2. tachycardia
3. bradycardia
4. hypotension
5. intestine atony
6. an increase of salivation

11. In the case of Parkinson disease are employed:
1. Cyclodolum
2. Dipheninum
3. Remantadinum
4. Carbamazepinum
5. Natrii valproas
6. Levodopa

12. Cyclodolum causes following side effects:
1. an increase of intraocular pressure
2. tachycardia
3. vomiting, nausea
4. intestine atony
5. CNS excitation
6. depression of respiration

13. In treatment of parkinsonism are employed:
1. Phenobarbitalum

2. Carbidopa+levodopa (nakom)
3. Carbamazepinum
4. Aethaminalum-natrium
5. Bromocriptinum
6. Remantadinum
7. Dipheninum
8. Levodopa

14. Levodopa:
1. used to prevent epilepsy
2. increases dophamine content in the CNS
3. decreases muscle rigidity and hypokinesia
4. blocks turning of dioxyphenylalanine into dophamine

15. Nakom is composed of:
1. Dipheninum
2. Levodopa and carbidopa
3. Carbidin
4. Remantadinum

16. Pathogenetic treatment of parkinsonian patient causes:
1. a decrease of dophamine content in the brain
2. an increase of dophamine content in the brain
3. an increase of acetylcholine content in the brain
4. decreases influence of acetylcholine
5. stimulates dophamine receptors
6. blockade dophamine receptors
7. decreases glutamatergic influence

17. Nakom differs from levodopa by:
1. content of carbidopa
2. content of benserazid
3. not penetrating blood-brain barrier
4. more substantial transition of levodopa into CNS
5. content of peripheral dioxyphenylalanine-decarboxylase inhibitor

18. Cyclodolum is characterized by:
1. blockade of choline receptors in basal nuclei
2. ability to block peripheral choline receptors
3. depression of dophamine recapture
4. stimulation of dophamine storage in the synaptic cliff
5. an increase of intraocular pressure

19. Remantadinum:
1. employed in epileptic status
2. is a direct antagonist of cyclodolum
3. blocks glutamate receptors in basal nuclei
4. exerts antiviral action
5. is a compound of ‘nakom’

20. Which of the following are dophamine receptor stimulators?
1. Cyclodolum
2. Carbidopa
3. Bromocriptinum
4. Carbamazepinum
5. Ethosuximidum
6. Levodopa

21. Choose disadvantages of barbiturates:
1. continuation of the sleep is no more than 30 min
2. disturbs falling asleep
3. nephrotoxicity
4. may cause habitation
5. considerable drug hangover
6. may cause addiction
7. therapeutic breadth is shorter than that of benzodiazepines

22. Phenobarbitalum exerts following actions:
1. hypnotic
2. sedative
3. hypotensive
4. antiepileptic
5. antiparkinsonian
6. aesthetic
7. anxiolityc

23. Choose hypnotic drugs:
1. Carbamazepinum
2. Zolpidem
3. Nakom
4. Nitrazepamum
5. Diazepam
6. Dipheninum
7. Phenazepamum

24. In the case of falling asleep disturbance are employed:
1. Dipheninum
2. Aethaminalum-natrium
3. Cyclodolum
4. Trimethinum
5. Phenazepamum

25. Mechanism of action of barbiturates:
1. opening of chloride channels and membrane hyperpolarization
2. an increase of GABA inhibitory effect
3. an increase in GABA synthesis
4. an increase of acetylcholine synthesis
5. blockade of GABA receptors

26. Phenobarbitalum shows following properties:
1. ganglion blocking action
2. hypnotic
3. anesthetic
4. antiepileptic
5. hypotensive
6. antiparkinsonian
7. sedative

27. Which of the following drugs increase GABA receptors affinity?
1. Phenobarbitalum
2. Remantadinum
3. Diazepam
4. Bemegridum
5. Lamotriginum

28. Which of the following cause induction of hepar enzymes?
1. Dipheninum
2. Cyclodolum
3. Phenobarbitalum
4. Carbamazepinum
5. Bemegridum

29. Which of the following may cause habitation?
1. Cyclodolum
2. Phenobarbitalum
3. Nitrazepamum

4. Zopiclonum

30. Nitrazepamum causes hypnotic action because:
1. it excites benzodiazepine receptors
2. blocks benzodiazepine receptors
3. potentiates action of GABA
4. excites central adrenoreceptors
5. stimulates barbiturate receptors

31. Chlorali hydras:
1. employed to deal with seizures
2. has irritative properties
3. its dose is 0,5-1,0 g
4. is a derivative of barbituric acid
5. is an antiparkinsonian agent
6. has antihypertensive action

32. Which of the following least of all disturb distribution of rapid eye movement (REM) and non-REM sleep?
1. Phenobarbitalum
2. Aethaminalum-natrium
3. Natrii oxybutyras
4. Zopiclonum
5. Donormil

619. In the case of barbiturate poisoning
1. gastric lavage
2. insertion of acid solutions
3. insertion of alkaline solutions
4. force diuresis
5. decrease diuresis
6. artificial ventilation
7. administer hypotensive agents

33. In the case of barbiturate poisoning alkaline solutions are administered to:
1. neutralize acid compounds in the intestines
2. speed excretion of barbiturates with urine
3. support alkaline storage of the body
4. decrease reabsorption of barbiturates in the kidney tubules
5. increase excretion of barbiturates by the kidneys

34. Choose antiepileptic drugs:

1. Bemegridum
2. Natrii valproas
3. Dipheninum
4. Carbamazepinum
5. Cyclodolum
6. Nakom

35. Which of the following exert antiepileptic action?
1. Galanthaminum
2. Carbamazepinum
3. Phentolaminum
4. Natrii valproas
5. Propranololum
6. Clonazepamum

36. Antiepileptic drugs should not be withdrawn abruptly because:
1. it may cause ‘recoil’ effect
2. it is needed to prevent addiction
3. it may make seizures more frequent
4. it may cause epinephral insufficiency

37. Antiepileptic drugs may have such mechanisms of action as following:
1. depression on dophamine synthesis
2. depression of GABA synthesis
3. activation of the GABA-system
4. a decrease of sodium channels permeability
5. an increase of intracellular sodium content

38. In the case of petit mal seizures most effective are:
1. Phenobarbitalum
2. Hexamidinum
3. Natrii valproas
4. Ethosuximidum

39. Dipheninum:
1. causes sleep
2. prevents grand mal seizures
3. blocks sodium channels
4. causes hypotension
5. induces microsomal enzymes
6. its action resembles that of cyclodolum

40. Which of the following antiepileptic drugs activate GABA-system?
1. Dipheninum
2. Ethosuximidum
3. Phenobarbitalum
4. Clonazepamum
5. Carbamazepinum

41. Ethosuximidum:
1. effective in the case of petit mal seizures
2. blocks potassium channels
3. is an antiparkinsonian drug
4. exerts anxiolityc action
5. is an analog of dipheninum
6. is an antiepileptic agent

42. Natrii valproas:
1. antiepileptic agent
2. similar to levodopa
3. increases GABA content in the CNS
4. used in the case of petit mal seizures
5. exerts an analgesic action

43. To deal with an ongoing seizure we can employ:
1. Diazepam
2. Sydnocarbum
3. Ethosuximidum
4. Chlorali hydras

P. W. 12.
Theme:
Pharmacology of opioid (narcotic) analgesics. Pharmacology of non-opioid (non-narcotic) analgesics.

General questions:

1. General classification of analgesic drugs. Comparative characteristics of opioid and non-opioid analgesics.
2. Opioid analgesics and antagonists. Classification and mechanism of action.
3. Pharmacology of Morphine hydrochloride: mechanism of action, pharmacodynamics and pharmacokinetics, therapeutic use.
4. Comparative characteristics of opioid analgesics. Therapeutic use and adverse effects.
5. Acute poisoning with opioid analgesics. Clinical symptoms and treatment. Characteristics of Naloxone, Naltrexone.
6. Drug addiction to opioid analgesics. Abstinent syndrome, methods of treatment. Narcomania as a social-biologic problem.
7. General classification of analgesic drugs. Comparative characteristics of opioid and non-opioid analgesics.
8. Non-opioid analgesics. Classification by chemical structure.
9. The mechanism of analgesic antipyretic, anti-inflammatory actions of non-opioid analgesics.
10. Pharmacodynamics and pharmacokinetics. Clinical use and adverse effects of salicylates.
11. Pharmacologic characteristics of pyrazolone compounds (Anagine, Butadione), antranil and compounds (Acide Mephenamice); paraaminophenol compounds (Paracetamol, Phenacetin); indole-acetic acid compounds (Indometacine); phenyl-acetic acid compounds (Diclofenac-Natrii), propionic acid compounds (Ibuprophen) and other groups. Therapeutic uses.
12. Adverse effects of non-opioid analgesics and their prophylaxis.

Classification of opioid (narcotic) analgesics

I. Opioid (narcotic) analgesics and antagonists:

1. Full agonists of opioids or strong-effective agonists:

A. Alkaloid of opium:

- Morphini hydrochloridum
- Codeini phosphas

B. Neogalenic drug

- Omnoponum

C. Synthetic morphine compounds

2. Partial agonists (or agonists-antagonists)

- Pentazocini hydrochloridum (lactas)
- Tramadolum
- Butorphanolum
- Buprenophinum
- Nalorphini hydrochloridum

3. Antagonists:
    - Naloxoni hydrochloridum
    - Naltrexoni hydrochloridum

Classification of non-opioid analgesics

Non-opioid (non-narcotic) analgesics:

1. Salicylates (Salicylic acid compounds)
    - Acidum acetylsalicylicum (Aspirin)
    - Acidum salicylicum
    - Natrii salicylas (Enterozam)
    - Metilsalicylas
2. Pyrazolone compounds:
    - Analginum (Metamizolum)
    - Butadionum (Phenylbutazone)
3. Aniline (para-aminophenol) compounds
    - Paracetamolum (Acetaminophenum, Panadolum)
4. Indol-acetic acid compounds:
    - Indometacinum (Metindolum)
5. Phenyl-acetic acid compounds:
    - Diclofenac-Natrium (Ortophen, Voltaren)
6. Antranil acid compounds:
    - Acidum mephenamicum
7. Propionic Acid compounds
    - Ibuprophenum (Bruphenum)
    - Naproxenum (Naprosinum)
8. Oxicam derivatives:
    - Piroxicamum
    - Meloxicamum (Movalis)
9. Cox-2 inhibitors:
    - Celecoxibum (Celebrex)
10. Other compounds:
    - Amizonum

Home assignment on prescription:

1. Omnoponum in ampoules.
2. Tramadolum in capsules.
3. Promedolum in ampoules.
4. Pentazocini lactas in tablets and suppositories.
5. Nalorphini hydrochloridum in ampoules.
6. Butorphanolum in ampoules.
7. Salicylic acid in ointment, paste and aspersione.
8. Paracetamolum in tablets.
9. Mephenamic acid in tablets.
10. Ibuprophenum in dragee.
11. Amizonum in tablets.

CASE STUDY

1. A 45-year-old woman is found outside her car after hitting a tree. The car appears severely damaged. There is no evidence as to how the woman escaped from the car. It is thought that she was able to open her door and then fell from the car. When she is discovered, she is conscious but disoriented and complaining of severe pain of multiple origins, craniocerebral trauma was diagnoswd. While in route to the emergency department, her pain increases in intensity. Which opioid or other drug might be used to ease her pain immediately upon her arrival at the hospital?

2. 30-year-old woman had gradually developed painful wrists over 4 weeks; she had not experienced similar episodes of pain before. On examination, both wrists and the metacarpophalangeal joints of both hands were tender but not deformed. What treatment would you choose?

Educational research work

Assignment 1.

Prescribe:

1. Morphini hydrochloridum in ampoules.
2. Phentanylum in ampoules.
3. Naloxonum in ampoules.
4. Promedolum in tablets.
5. Tramadolum in suppositories.
6. Ibuprophenum in tablets.
7. Diclofenac-natrium in ampoules.
8. Paracetamolum in ointment.
9. Meloxicamum in tablets.
10. Indometacinum in ointment.

Assignment 2.

Pharmaco-therapeutical task:

1. An analgesic used in myocardial infarction.
2. An analgesic used for neuroleptanalgesia.
3. An analgesic for obstetric anaesthesia.
4. An antidote in acute poisoning with opioid analgesics.
5. A neogalenic opium drug.
6. A derivative of para-aminophenol used for relief of a headache.
7. An antipyretic agent from the group of salicylates.
8. A derivative of phenyl-acetic acid used for treatment of arthritis, neuritis and myositis.
9. A derivative of indol-acetic acid with a significant anti-inflammatory action.
10. Propionic acid compound for arthritis treatment.

Assignment 3. *Individual work: fill in the table.*

Drugs	Dosage form	Indication to use
1. Opioid (narcotic) analgesics 2. Non-opioid (non-narcotic) analgesics.		

Assignment 4.
*Choose **one** correct answer:*

1. A patient was prescribed a narcotic analgesic which is derivative of cyclogexanol, agonist-antagonist of opiate receptors, a little weaker than morphine. It does not influence the gastro-intestinal tract, has some analgetic action, is characteristic for non-narcotic analgesics; it is not recommend for children under 14 years. What drug is this?
A. Promedolum.
B. Tramadolum.
C. Morphini hydrochloridum.
D. Codeini phosphas.
E. Omnoponum.

2. In 2-3 hours after parenteral introduction of a drug a patient became comatose. Cheyne-Stokes respiration was observed, pupils became abruptly miotic, the knee reflex was kept. What drug could lead to the poisoning?
A. Diazepamum.
B. Aminazinum.
C. Morphini hydrochloridum.
D. Spiritus ethylicus.

E. Phenobarbitalum.

3. An unconscious patient has been taken to a hospital. His skin is cold, pupils are miotic, breathing is complicated (Cheyne-Stokes type), arterial pressure is low, the urinary bladder is overfilled. The diagnosis is "poisoning with morphine". What drug is it necessary to give as an antidote?
A. Natrii thiosulphas.
B. Bemegridum
C. Cytitonum.
D. Unithiolum.
E. Naloxonum.

4. The woman, 35 years old, has a pain syndrome connected with the delay of the first labor stage. What drug is necessary to be used for relieving the pain?
A. Codeini phosphas.
B. Analginum.
C. Morphini hydrochloridum.
D. Promedolum.
E. Paracetamolum.

5. The patient, 30 years old, after traffic accident was delivered to a hospital with a hip bones fracture. The patient has low arterial pressure, weak pulse, the increased pain reaction to the least touch in the place of damage. What is necessary to use to prevent traumatic shock of this patient?
A. Papaverini hydrochloridum.
B. Paracetamolum.
C. Pentazocinum.
D. Analginum.
E. Morphini hydrochloridum.

6. Morphine hydrochloride solution has been introduced hypodermically to the patient with traumatic shock to provide anesthesia. What is the mechanism of analgesic effect of this drug?
A. Abnormality of afferent nerves impulses conduction.
B. Blockade of peripheral sensitive receptors.
C. Change of pain emotional coloring.
D. Interaction with opiate receptors.
E. Inhibition of pain mediators formation in peripheral tissues.

7. The boy, 15 years old, with manifestations of acute poisoning with narcotic analgesics was prescribed a specific antagonist of Morphine medicine. What drug is it?

A. Naloxonum.
B. Trilon B.
C. Pentazocsini hydrochloridum.
D. Unithiolum.
E. Bemegridum.

8. Prescribe a patient a drug — a synthetic substitute of morphine which has a sedative effect, does not spasm muscles and sphyncters of the digestive tract, slightly influences the center of respiration, and reduces the tone of the neck of uterus.
A. Analginum.
B. Omnoponum.
C. Phentanylum.
D. Paracetamolum.
E. Promedolum.

9. A 40-yeas-old patient with diagnosis acute pancreatitis was brought to the surgical department. Which of the below mentioned drugs should be prescribed in order to relieve the pain and prevent the painful shock?
A. Atropini sulfas
B. Promedolum
C. Indometacinum
D. Diclofenac-natrium
E. Papaverini hydrochloridum

10. A 65-years-old woman with lower extremities fracture was prescribed the drug form narcotic analgesics group. Name the drug.
A. Furosemidum
B. Pyracetamum
C. Heparinum
D. Cynnarizinum
E. Promedolum

11. The pregnant woman with pathology was injected with promedolum for relieving the pain during childbirth. What pharmacological group this drug belongs to?
A. Phenylpiperidine derivative
B. Alkaloid of opium
C. Benzomorphan derivative
D. Oxymorphone derivative
E. Diphenylheptane derivative

12. Ataralgesia was conducted to a patient for surgical operation. The combination of what drugs is used for this type of general anaesthesia?
A. Omnoponum + nitrogen oxide
B. Morphinum + analginum
C. Diazepamum + phentanylum
D. Phentanylum + droperidolum
E. Phenobarbitalum + promedolum

13. A 60-years-old patient L. is suffered from lungs cancer with multitude metastases. Choose the drug for relieving of the pain in this patient.
A. Morphini hydrochloridum
B. Diclofenac
C. Analginum
D. Acidum acetylsalicylicum
E. Paracetamolum

14. A man being crushed in the automobile catastrophe with thigh-bone and ribs fractures was brought to the traumatic department. What should be prescribed to him to prevent the pain shock?
A. Analginum
B. Acidum acetylsalicylicum
C. Difeninum
D. Morphini hydrochloridum
E. Diclofenac-natrium

15. A patient with myocardium infarction was brought to the reanimation department. What drug the patient should be injected with for pain shock treatment?
A. Naloxonum
B. Analginum
C. Paracetamolum
D. Celecoxibum
E. Morphini hydrochloridum

16. A patient suffering from acute poisoning with morphinum symptoms was brought to the reanimation department. Which of the mentioned drug should be prescribed for lavage of the stomach and intestine in this situation?
A. Tanninum
B. Natrii hydrocarbonas
C. Kalii permanganas
D. Cordiaminum
E. Oak-rind decoction

1. A patient having suffered from the acute myocardium infarction was prescribed acidum acetylsalicylicum of 100 mg 1time per a day by doctor. What action of aspirinum the doctor expected?
A. Analgesic
B. Anti-inflammatory
C. Anti-fever
D. Antiagregatic
E. Vasodilating

2. For what purpose a patient suffering from angina pectoris was prescribed acidum acetylsalicylicum?
A. Suppression of fibrinolytic blood activity
B. Agregatic action
C. Disagregatic action
D. Anti-inflammatory action
E. Increasing of fibrinolytic blood activity

3. A patient in order to prevent appearing of thrombus as a result of ischemic heart disease was prescribed the drug from non-steroid anti-inflammatory action group. Name this drug.
A. Ibuprophenum
B. Pyroxicamum
C. Acidum mephenamicum
D. Acidum acetylsalicylicum
E. Indometacinum

4. A 65-years old patient suffered from ischemic heart disease was prescribed acidum acetylsalicylicum by cardiologist. What dose and regimen of drug application this drug has antiagregatic action?
A. Of 0,1 g thrice a day after mill
B. Of 0,25 g thrice a day after mill
C. Of 0,5 g once before mill in the morning
D. Of 0,1 g once a day durably
E. Of 1,0 g in the afternoon after mill

5. A patient with high temperature was brought to the infectious department. A patient was prescribed non-narcotic analgesics from acidum salicylicum derivatives group. Name the drug.
A. Analginum
B. Ibuprophenum
C. Acidum acetylsalicylicum
D. Paracetamolum

E. Diclofenac-natrium

6. A patient suffering from ischemic disease was prescribed the drug from non-steroid anti-inflammatory agents group in order to prevent appearing of thrombus. Indicate this drug.
A. Ibuprophenum
B. Pyroxicamum
C. Acidum acetylsalicylicum
D. Meloxicamum
E. Indometacinum

7. A patient with respiratory illness and high temperature used anti-fever drug. The temperature decreased but sickness, pain in epigastric area and vomiting with blood appeared. What drug may cause such adverse effects?
A. Ortophenum
B. Spasmalgonum
C. Acidum acetylsalicylicum
D. Analginum
E. Paracetamolum

8. A patient with virus infection was prescribed medicinal agent non-selective blocker COX – 2 for decreasing the temperature. Name the drug.
A. Analginum
B. Ortophenum
C. Spasmalgonum
D. Acidum acetylsalicylicum
E. Paracetamolum

9. A patient in acute period of myocardium infarction was prescribed medicinal agent in tablets with antiagregatic action by doctor. Soon sickness, vomiting and pain in stomach appeared. What drug might cause such effects?
A. Amizonum
B. Analginum
C. Acidum acetylsalicylicum
D. Meloxicamum
E. Paracetamolum

10. In a 55-years-old patient on 4-th day of diclofenac-natrium treatment intestine bleeding appeared as a result of intestine membrane ulcer. What caused ulcerogenic drug action?
A. Blocking of cyclooxygenase - 1
B. Decreasing number of leukotrienes

C. Blocking of phosphodiestherasa enzyme
D. Decreasing number of erythrocytes
E. Decreasing number of leucocytes

11. A 65-years-old patient suffering from rheumatic arthritis was prescribed the course of diclofenac-natrium treatment by doctor. What drug should be used simultaneously in order to relieve ulcerogenic diclofenac-natrium action?
A. Vitamin B_{12}
B. Propranololum
C. Interferonum
D. Famotidinum
E. Furosemidum

12. A patient suffering from rheumatism was prescribed non-steroid anti-inflammatory drug diclofenac-natrium. After acute period of accompanied disease appeared diclofenac-natrium was stopped. What disease is contra-indicated in case of diclofenac-natrium treatment?
A. Diabetes
B. Angina pectoris
C. Bronchitis
D. Stomach ulcer
E. Hypertonic disease

13. A patient with acute respiratory disease and body temperature 39,5° C was brought to the infective department. What drug should be prescribed as anti-fever agent?
A. Paracetamolum
B. Ambroxolum
C. Salbutamolum
D. Adrenalini hydrochloridum
E. Retabolilum

14. A patient suffering from rheumatic arthritis was prescribed the drug from non-steroid anti-inflammatory agents group – selective inhibitor COX-2 for decreasing negative effect on stomach mucous membrane. Indicate the drug.
A. Butadionum
B. Analginum
C. Acidum acetylsalicylicum
D. Celecoxibum
E. Ibuprophenum

15. A patient with acute condition of rheumatic arthritis having in anamnesinum chronic gastritis was prescribed a selective blocker of cycloogenase-2. Name this drug.
A. Butadionum
B. Diclofenac-natrium
C. Indometacinum
D. Celecoxibum
E. Pyroxicamum

16. A patient with acute condition of rheumatic arthritis having in anamnesis chronic gastritis was prescribed celecoxibum. What caused the absence of drug adverse action on food canal?
A. Stimulation of adenilatcyclase
B. Suppression of cycloogenase-2
C. Suppression of phospholipase A2
D. Suppression of cycloogenase-1
E. Suppression of phosphodiestherase

17. An ill woman went to the doctor to claim the pains and limited movements in knee-joints. Which of non-steroid anti-inflammatory drugs would be better to prescribe taking into consideration that during anamnesis chronic gastroduodenitis appeared?
A. Acidum acetylsalicylicum
B. Diclofenac-natrium
C. Promedolum
D. Celecoxibum
E. Butadionum

18. A patient with rheumatic arthritis and duodenum ulcer should be prescribed non-steroid anti-inflammatory drug. What drug should be chosen in this case?
A. Acidum acetylsalicylicum
B. Paracetamolum
C. Analginum
D. Celecoxibum
E. Diclofenac-natrium

19. A patient with knee-joint arthritis is suffering from stomach ulcer. What drug should be prescribed to him in order to relieve pain in this case?
A. Celecoxibum
B. Analginum
C. Aspirinum
D. Promedolum

E. Diclofenac-natrium

20. A patient suffering from rheumatic arthritis was prescribed the drug from non-steroid anti-inflammatory action drugs group – selective inhibitor COX-2 in order to decrease negative effect upon intestine mucous membrane. Indicate the drug.
A. Butadionum
B. Analginum
C. Acidum acetylsalicylicum
D. Celecoxibum
E. Ibuprophenum

21. The main reason for using Celecoxibum (selective COX-2 inhibitor) rather than a nonselective COX inhibitor (aspirinum, others) is that Celecoxibum:
A. Cures arthritis, rather than just give symptom relief.
B. Effectively inhibits uric acid synthesis.
C. Has a low risk of cardiotoxicity.
D. Is associated with a lower risk of gastric or duodenal ulceration.
E. Has significant faster onset of action.

22. Determine the drug. This drug is a derivative of aniline. It possesses analgesic and antipyretic activity. It almost doesn't have anti-inflammatory properties. It is used in headache, myalgia, neuralgia, fever. The adverse effects are cyanosis, methemoglobinemia, anemia, leucopenia, allergic reactions, jaundice, collapse, nephrotoxicity and hepatotoxicity.
A. Meloxicamum.
B. Analginum.
C. Paracetamolum.
D. Aspirinum.
E. Allopurinolum.

Assignment 5.
*Choose **all** correct answers:*

1. Choose narcotic (opioid) analgesics:
1. Morphini hydrochloridum
2. Paracetamolum
3. Analginum
4. Omnoponum
5. Promedolum
6. Phentanylum

2. Choose drugs for treatment of the acute poisoning by narcotic analgesics:
1. Alloximum
2. Dipiroximum
3. Nalorphini hydrochloridum
4. Naloxonum
5. Proserinum
6. Naltrexonum

3. Choose symptoms of the acute poisoning by Morphini hydrochloridum:
1. depression of respiration
2. excitation of the respiration center
3. hypotension
4. bradycardia
5. tachycardia
6. midriasis

4. Morphini hydrochloridum causes:
1. dilatation of bronchi
2. cardiotoxic effects
3. miosis
4. constipation
5. low temperature of the body
6. high temperature

5. Omnoponum is characterized by:
1. it is a neogallenic drug
2. has spasmolytic effects
3. is a substitute of morphine in the case of colic
4. is a drug of choice in the case of bronchial asthma
5. causes hypoglycemia
6. synthetic opioid analgesic

6. Morphini hydrochloridum causes miosis because of:
1. stimulation of the cholinergic receptors of m. sphincter pupillea
2. stimulation of the adrenergic receptors of m. dilatator pupillea
3. block of the cholinergic receptors
4. block of the adrenergic receptors
5. stimulation of the oculomotor centre
6. constriction of the orbicular muscle of iris

7. In the case of poisoning by Morphini hydrochloridum it is needed:
1. gastric lavage with Kalii permanganas

2. warming
3. administration of Naloxonum
4. administration of anticholinesterase drug
5. to put ice all around patient
6. administration of Alloximum

8. Potential for addiction are:
1. Paracetamolum
2. Analginum
3. Ibuprofenum
4. Promedolum
5. Morphini hydrochloridum
6. Butorphanolum

9. Which opioid analgesics are synthetic:
1. Morphini hydrochloridum
2. Codeini phosphas
3. Pentazocini lactas
4. Buprenorphine
5. Butorphanolum
6. Tramadolum

10. Tramadolum is characterized by:
1. double mechanism of analgesic activity
2. efficacy upon oral administration
3. lower influence on the respiratory center
4. less prominent hypotensive action
5. cardiotonic action
6. is a neogalenic drug from opium

11. Phentanylum is characterized by:
1. analgesic action is stronger than that of Morphini hydrochloridum
2. duration of action is longer than that of Morphini hydrochloridum
3. higher toxicity than morphine
4. is used for neuroleptanalgesia
5. analgesic action is weaker than that of Morphini hydrochloridum
6. duration of action is shorter than that of Morphini hydrochloridum

12. Naloxoni hydrochloridum:
1. is a complete antagonist of morphine
2. is an agonist-antagonist
3. is administered in the same cases that morphine

4. is administered in the case of acute poisoning by morphine
5. is a non-opioid analgesic
6. is a reactivator of cholinesterase

13. Codeinum:
1. is a cough suppressant
2. has lower ability to suppress respiratory center
3. is an alkaloid of opium
4. has stimulatory action on the respiratory centre
5. has spasmolytic action
6. is an antidote against morphine poisoning

14. Identify narcotic analgesics:
1. Tramadolum
2. Phentanylum
3. Paracetamolum
4. Analginum
5. Ibuprofenum
6. Amizonum

15. In the mechanism of analgesic action of opioid analgesics there are:
1. a decrease of receptors' sensitivity
2. depression of pain impulses conduction in the CNS
3. a decrease in pressure on the nerve endings via edema reduction
4. stimulation of the opiate receptors
5. stimulation of the GABA receptors
6. COX blockade

16. Opioid analgesics:
1. Paracetamolum
2. Analginum
3. Omnoponum
4. Promedolum
5. Phentanylum

17. Symptoms of morphine poisoning:
1. respiratory depression
2. hypotension
3. hypertension
4. bronchospasm
5. hyperreflexia

18. Morphinum causes:
1. bronchodilation
2. spasmolytic action
3. miosis
4. constipation
5. hypothermia

19. Which of the following may cause addiction?
1. Tramadolum
2. Analginum
3. Ibuprofenum
4. Promedolum
5. Butorphanolum

20. Addiction may cause:
1. Butorphanolum
2. Acidum acetylsalicylicum
3. Codeini phosphas
4. Omnoponum
5. Paracetamolum

21. Which of the following opioids are natural?
1. Morphini hydrochloridum
2. Codeini phosphas
3. Buprenorphinum
4. Omnoponum
5. Tramadolum

22. Tramadolum is characterized by:
1. duration of action 9 hours
2. effective in the case of oral administration
3. stimulates respiratory centre
4. weaker analgesic action
5. cardiotonic action

23. Naloxonum is characterized by:
1. antagonism to opioid receptors
2. complete morphine antagonist
3. agonism-antagonism
4. indications are similar to that of morphinum
5. administered in the case of morphine poisoning

24. Codeini phosphas:
1. exerts antitussive action
2. is an opioid analgesic
3. causes respiratory depression in a lesser degree than morphinum
4. is an alkaloid of opium
5. stimulates respiratory center
6. exerts spasmolytic action

25. Pentazocinum is characterized by:
1. is effective in the case of cancer
2. analgesic action is weaker than that of morphinum
3. causes a rise in blood pressure
4. has weaker influence of the intestines than morphinum
5. stimulates respiratory center

26. Morphini hydrochloridum:
1. stimulates m. Oculomotorius
2. stimulates respiratory centre
3. stimulates vagus nerve center
4. depresses heat-regulating center
5. depresses nociceptive centre
6. increases intestine tone
7. has antiemetic action

27. Phentanylum in the case of overdosing may cause
1. respiratory centre depression
2. an increase in skeletal muscles tone
3. a rise in blood pressure
4. rigidity of chest and limb muscles
5. bradycardia

28. Habitation to morphinum means:
1. stronger action in the case of repeated administration
2. decreased sensitivity
3. an increased need of drug to achieve the same effect
4. appearing of euphoria
5. development of tachyphylaxis

29. Side effects of morphinum:
1. an increased peristalsis
2. dilatation of coronary vessels
3. dilatation of brain vessels

4. in increase in sphincters tone
5. tachycardia

30. Mechanism of action of opioids includes:
1. stimulation of opioid receptors
2. strengthening of antinoceptive system
3. depression of emotional pain perception
4. blockade of bradykinin receptors
5. blockade of sodium canals

31. Naltrexonum
1. complete morphine antagonist
2. its effect develops gradually
3. effective in the case of drug addiction an alcoholism
4. used as opioid analgesic
5. administered orally

32. Opioid analgesics:
1. show synergism with encephalins and endorphins
2. are in antagonism with naloxonum
3. depress respiratory center
4. stimulate respiration
5. depress vagus nerve centre

33. Which of the following are opium alkaloids?
1. Naloxoni hydrochloridum
2. Codeini phosphas
3. Morphini hydrochloridum
4. Pentazocinum
5. Tramadolum

34. In the case of frequent administration morphinum may cause such effects as:
1. spastic
2. analgesic
3. hypertensive
4. hypotensive
5. antianginal

35. Buprenorphinum in comparison to morphinum:
1. has more powerful analgesic effect
2. its action develops gradually

3. duration of action longer
4. more potential for addiction
5. produced in tablets and ampoules

36. Both morphinum and papaverinum:
1. are opium alkaloids
2. spasmolytic
3. depress CNS
4. enter into omnoponum composition
5. analgesics

1. Diclofenac-natrium exhibits antipyretic action due to:
1. inhibition of prostaglandins synthesis
2. an increase in emission of heat
3. an increase in heat-production
4. depression of heat-regulating center
5. excitation of heat-regulating center
6. constriction of vessels

2. Indometacinum is characterized by:
1. anti flu activity
2. reduction of chronic pain
3. inhibition of prostaglandin synthesis by COX
4. spasmolytic action
5. administration in the case of rheumatism
6. antipyretic action

3. Ulcerogenic action of non-narcotic analgesics is due to:
1. inhibition of COX-1
2. inhibition of COX-2
3. deranged synthesis of gastroprotective prostaglandins
4. stimulation of nervus vagus
5. stimulation of histamine receptors
6. hepato-intestinal circulation

4. Acidum acetylsalicylicum exerts such actions:
1. analgesic
2. antipyretic
3. anti-inflammatory
4. antiaggregatory activity
5. spasmolytic
6. haemostatic

5. Which effects a block of cyclooxygenase enzyme activity produces?
1. analgesia
2. antihistamine action
3. anti-inflammatory action
4. antiaggregatory activity
5. antipyretic action
6. gastroprotective action

5. Acidum acetylsalicylicum exerts:
1. antirheumatic action
2. antipyretic action
3. spasmolytic action
4. antiaggregatory activity
5. analgesic action
6. hypnotic action

6. Nonopioid analgesics:
1. Tramadolum
2. Phentanylum
3. Paracetamolum
4. Ibuprofenum
5. Amizonum

7. Nonopioid analgesics:
1. Meloxicam
2. Tramadolum
3. Paracetamolum
4. Analginum
5. Butorphanolum

8. Mechanism of analgesic action of anti-inflammatory drugs includes:
1. stimulation of pain mediators production
2. depression of pain stimuli at subcotical sites
3. a decrease of pressure on nerve endings due to edema lessening
4. stimulation of opiate receptors
5. stimulation of GABA receptors

9. Depression of cyclooxygenase produces such effects as:
1. antihistamine
2. anti-inflammatory
3. ulcerogenic

4. antiaggregatory
5. antipyretic

10. Analginum is characterized by:
1. quick and short analgesic action
2. ability to depress hematopoiesis
3. allergic reactions are probable
4. antihistamine action
5. local anaesthetic activity

11. Acidum acetylsalicylicum is prescribed in the case of:
1. fever
2. toothache
3. myocardium infarction
4. bronchial asthma
5. hypertension

12. Indometacinum is characterized by
1. analgesic action
2. effectiveness in the case of chronic pain
3. depression of prostaglandin synthesis due to COX inhibition
4. spasmolytic action
5. prescribed in the case of rheumatism

13. Amizonum
1. derivative of isonicotinic acid
2. derivative of isoquinoline
3. stimulates production of interferon
4. has analgesic action
5. prescribed as spasmolytic

P. W. 13.
Theme:
Psychotropic drugs. Neuroleptics, tranquillizers and sedative agents

General questions:
1. Classification of psychotropic drugs.
2. Neuroleptics. Classification, general characteristics, mechanism of action, pharmacological effects, clinical uses.
3. Comparison of combined uses of neuroleptics with drugs from other groups. Neuroleptanalgesia. Adverse effects of neuroleptics and their correction.
4. Tranquillizers. Classification, general characteristics, mechanism of action.
5. Pharmacokinetics, pharmacodynamics of benzodiazepines derivatives, clinical use, adverse effects.
6. Comparative characteristics of tranquillizers. Daily used tranquillizers (Medazepam, Trioxasine, Grandaxine) . Combined use with drugs from other groups. Ataralgesia.
7. Sedative agents. Classification, pharmacological characteristics of salts of Brome. Pharmacodynamics and pharmacokinetics of bromides and drugs of plant origin (Tinctura Valerianae, Leonuri, Corvaldinum). Adverse effects, "bromism", clinical symptoms, treatment and prophylaxis.
8. Salts of Lithium, supposed mechanism of action, use for prophylaxis and treatment of manias, their adverse effects.

Classification of Neuroleptic drugs

1. Phenothiazine derivatives:
    - Aminazinum
    - Triphthazinum
    - Phthorphenazinum
2. Butyrophenone derivatives:
    - Haloperidolum
    - Droperidolum
3. Thioxanthene derivatives:
    - Chlorprothexinum
4. Benzamides:
    - Sulpiridum
5. Benzodiazepine derivatives:
    - Closapinum

Classification of Tranquillizers (Anxiolytic drugs)

1. Benzodiazepine derivatives:
    - Diazepamum (Sibazonum, Relanium)
    - Chlordiazepoxidum (Elenium, Chlozepidum)
    - Phenazepamum
    - Nozepamum (Tazepamum)
    - Lorazepamum
    - Mezapamum (Rudotel)
2. Propandiole derivatives:
    - Meprobamatum
3. Diphenylmetane derivatives:
    - Amizylum
4. Anxiolytic drugs of other chemical structure:
    - Trioxasinum

Sedative agents:

- Natrium bromidum
- Tincture of Valerianae
- Tincture of Leonuri
- Corvaldinum

Home task on prescription:

Prescribe:

1. Aminazinum in dragee.
2. Triphthazinum in tablets.
3. Haloperidolum in ampoules.
4. Chlordiazepoxidum in tablets.
5. Diazepamum in ampoules.
6. Mezapamum in tablets.
7. Tincture of Valerianae.

CASE STUDY

Ms. Anderson is a 29-year-old single woman who was diagnosed with schizophrenia more than 5 years ago. She started with haloperidol and then after several months switched to thiothixene. While her extrapyramidal signs with these agents were not unacceptable, the frequency of her acute psychotic episodes marked by paranoid delusions was not substantially diminished. Subsequently she was also given a trial of thioridazine with a similar clinical response to those of the earlier agents. What antipsychotic agent would be the most appropriate next choice for this patient? What are the primary concerns with the use of this drug, and what precautions should be taken during therapy with this agent?

Educational research work

Assignment 1.

Prescribe:

1. Aminazinum in ampoules.
2. Phenazepamum in tablets.
3. Corvaldinum in vial.
4. Chlorprothexinum in tablets.
5. Lithii carbonas in tablets.

Assignment 2.

Pharmaco-therapeutic task:

1. Phenothiazine derivative for treatment of psychosis.
2. Neuroleptic used for neuroleptanalgesia.
3. A drug which relieves the feeling of fear, anxiety, internal tension.
4. Daily tranquillizer.
5. Butyrophenone derivative for treatment of psychosis.
6. Drug used for treatment of manias.
7. Sedative agents of non-organic origin.
8. Drugs of plant origin, which has sedative action.
9. Thioxanthene derivative for treatment of psychosis.
10. Benzamide derivative for treatment of psychosis.

Assignment 3.

Individual work: fill in the table.

Drugs	Dosage forms	Indications to use
Neuroleptics: Tranquillizers: Sedative agents:		

Assignment 4.

*Choose **one** correct answer:*

1. To eliminate delirium and hallucinations in a patient with schizophrenia a doctor used aminazine. What is the mechanism of antipsychotic action of the drug?

A. Stimulation of cholinergic processes in the CNS.
B. Stimulation of adrenergic and dophaminergic processes in CNS.
C. Blockade of adrenergic and dophaminergic processes in CNS.
D. Blockade of cholinergic processes in CNS.
E. Blockade of the inverse neuronal capture of cateholamines.

2. A drug shows a strong, fast, but not long neuroleptic action. It potentiates action of analgesic, soporific agents, alcohol. It has antishock and antiemetic action. It belongs to buthyrophenone derivatives. What drug is this?
A. Aminazinum.
B. Droperidolum.
C. Triphtazinum.
D. Clozapinum.
E. Sulpiridum.

3. A woman who leads an active way of life has appealed to polyclinic with complaints of bad mood, migraine, emotional lability, heart pain. What drug for neurosis treatment should be prescribed, taking into consideration that the patient spends a lot of time at work?
A. Gidazepamum.
B. Aminazinum.
C. Phenazepamum.
D. Triftazinum.
E. Phenobarbitalum.

4. A patient developed symptoms of medicinal parkinsonism after psychosis treatment in a mental hospital. What drug had been used for his treatment?
F. Litii carbonas.
G. Mezapamum.
H. Natrii bromidum.
I. Aminazinum.
J. Nialamidum.

5. Acute heart attack is accompanied by retrosternal pain. Ineffectiveness of preliminary taken drugs has made the doctor to conduct neuroleptanalgesia. What neuroleptic is used for this type of anesthesia?
A. Droperidolum.
B. Metaperazinum.
C. Haloperidolum.
D. Reserpinum.
E. Aminazinum.

6. A patient with schizophrenia takes aminazine. Which of the listed pharmacodynamic effects is the basic one in this case?
A. Antipsychotic effect.
B. Antiemetic effect.
C. Hypotermic effect.
D. Myorelaxative effect.
E. Hypotensive effect.

7. A patient has been taking a mixture prescribed by neuropathologist for neurasthenia for 1 week. The patient feels better, but has developed conjunctivitis, rash, inertia, decrease of memory. She is diagnosed with bromism. What should be prescribed to decrease the symptoms?
A. Natrii oxybutiras.
B. Nitrazepamum.
C. Aminazinum.
D. Natrii chloridum.
E. Pilocarpini hydrochloridum.

8. These drugs do not arrest acute maniac excitation in the patients with psychical disorders, but prevent its appearance. They do not cause general inhibition, sedative effect. Which drug is used for treatment of manias?
A. Natrii bromidum
B. Diazepamum.
C. Aminazinum.
D. Droperidolum.
E. Lithii carbonas

9. These drugs amplify and concentrate the inhibitory process in the brain cortex. They exert sedative action, relieve irritability, do not eliminate the feeling of fear, anxiety. Determine this group.
A. Tranquilizers.
B. Sedatives
C. Neuroleptics.
D. Antidepressants.
E. Psychostimulants.

10. Determine the group of drugs which doesn't cause drug dependence.
A. Neuroleptics.
B. Tranquilizers.
C. Barbiturates.
D. Narcotic analgesics.
E. Psychostimulants.

11. A patient has been suffering from schizophrenia accompanied by arterial hypertension. A doctor administered neuroleptic possesing expressed hypotensive activity. Indicate this drug.
A. Haloperidolum.
B. Diazepamum.
C. Aminazinum.
D. Reserpinum.
E. Triphthazinum.

12. What group of drugs is used for the treatment and prevention of manias?
A. Antidepressants.
B. Sedatives.
C. Neuroleptics.
D. Tranquilizers.
E. Salts of Lithium.

13. A patient was addressed to a doctor with complaints of irritability, insomnia, fatigue. A doctor administered a sedative drug to him. In two weeks the patient began to complaine of cough, sleepiness, decrease of memory, rhinitis, conjunctivitis, dermatitis. What group of the drugs was administered by the doctor.
A. Tranquilizers.
B. Antidepressants.
C. Neuroleptics.
D. Psychostimulants.
E. Bromides.

14. Neuroleptoaqnalgesia was made to a patient because of myocardial infarction. What drug is used more often in combination with phentanile?
A. Aminazinum.
B. Droperidolum.
C. Diazepamum.
D. Sulpiridum.
E. Haloperidolum.

15. A driver of a truck was addressed to a doctor with complaints of emotional tension, anxiety. The doctor diagnosed neuroasthenia. Choose the “day time” tranquilizer for the treatment of this patient.
A. Diazepamum.
B. Trioxazinum.
C. Phenazepamum.
D. Piracetamum.

E. Aminazinum.

16. What neuroleptic is characterized by the following properties: phenothiazine derivative, blockes postsynaptyc dophamine and adrenoreceptors in the CNS, provides a sedative effect on the CNS, prolonged application can induce extrapyramidal abnormalities and neuroleptic syndrome?
A. Haloperidolum.
B. Diazepamum.
C. Triphthazinum.
D. Aminazinum.
E. Droperidolum.

17. A man with disoders of psychoemotional state and sleeplessness, was treated with diazepamum. Upon which receptors this drug influence?
A. Benzodiazepine receptors.
B. Alfa-adrenoreceptors.
C. Beta-adrenoreceptors.
D. M-cholinoreceptors.
E. N-cholinoreceptors.

18. A man is kept under the dispensary observation in psychoneurological clinic because of chronic alcoholism. Alcohol abuse led to acute psychosis. What drug can be expediently used?
F. Hygronium.
G. Atropini sulfas.
H. Pentaminum.
I. Aminazinum.
J. Adrenalini hydrochloridum.

19. A 38 year old man suffers from schizophrenia. He has come to a doctor with complaints of disorder of coordination and movements, tremor in his hands, drowsiness. The patient has been taking psychotropic drugs for a long period of time. What group of drugs can lead to such complex of symptoms?
A. Adaptogens.
B. Analgetics.
C. Antidepressants.
D. Psychomotor stimulators.
E. Neuroleptics.

20. To perform an oral surgery a dentist prescribed a combination of drugs with the purpose of ataralgesia. What tranquilizer — derivative of benzodiazepine — is used forthis purpose?

A. Sulpiridum.
B. Droperidolum.
C. Trioxasinum.
D. Diazepamum.
E. Aminazinum.

21. Which effect is not developed after aminazinum (chlorpromazine) administration?
A. Anti-emetic action
B. Hypothermia
C. Arterial hypotension
D. Anti-histamine action
E. Stimulation of the brain cortex

22. A man develops akathisia, a Parkinson-like syndrome, galactorrhea, and amenorrhea, during the therapy. Which of the following mechanisms is present?
A. Blockade of muscarinic receptors
B. Blockade of dopamine receptors
C. Blockade of α-adrenergic receptors
D. Stimulation of dopamine receptors
E. Supersensitivity of dopamine receptors

Assignment 5.
*Choose **all** correct answers:*

1. Anxiolytic action of the neuroleptics results from:
1. block of dophaminergic receptors in mesolimbic system
2. stimulation of dophaminergic receptors in the mesolimbic system
3. block of adrenoreceptors
4. block of cholinoreceptors
5. block of serotonergic receptors
6. stimulation of the cortex of cerebrum

2. Pharmacological effects of neuroleptics are:
1. antipsychotic
2. analeptic
3. antiemetic
4. sedative
5. anxiolityc
6. awareness-inducing

3. Aminazinum:

1. is a derivative of phenothiazine
2. is a psychotropic agent with depressive type of action
3. has antipsychotic action
4. is a derivative of butyrophenone
5. acts only on the cortex of cerebrum

4. Choose effects of aminazinum, which are caused by its action on the CNS:
1. hypothermic
2. antiemetic
3. awareness-inducing action
4. emetic
5. hypertensive
6. relaxation of the skeletal muscles

5. Aminazinum:
1. blocks alpha-adrenoreceptors
2. stimulates exocrine glands
3. has antihistaminic properties
4. blocks M-cholinergic receptors
5. stimulates dophaminergic receptors
6. blocks GABA-receptors

6. Aminazinum:
1. decreases blood pressure
2. stimulates gastric secretion
3. inhibits gastric secretion
4. causes hypothermia
5. increases blood pressure
6. stimulates vasomotor center

7. Chlorprothixenum:
1. is a neuroleptic, derivative of thioxanthene
2. is a tranquilizer, derivative of benzodiazepine
3. has a pronounced sedative effect
4. increases blood pressure
5. is a strongest antipsychotic agent
6. causes vomiting

8. Neuroleptics exert:
1. antipsychotic action
2. awareness-inducing action
3. hypotensive action

4. an increase in motor activity
5. activation of reticular formation
6. potentiation of effects caused by CNS suppressants

9. Neuroleptics cause such effects:
1. antipsychotic
2. narcotic
3. sedative
4. anxiolityc
5. anesthetic
6. awareness-inducing

10. Antipsychotic action of neuroleptics is due to:
1. block of dophaminergic receptors
2. an increase in synthesis of dophamine
3. block of serotonin receptors
4. block of GABA-receptors
5. activation of reticular formation
6. block of opioid receptors

11. Neuroleptics cause a decrease in blood pressure because of:
1. sympatholytic action
2. an inhibition of vasomotor centre
3. block of parasympathetic action
4. diuretic action
5. block of peripheral alpha-adrenoreceptors
6. block of peripheral cholinergic receptors

12. Side effects of aminazinum are:
1. sluggishness, drowsiness
2. parkinsonism
3. an increase in blood pressure
4. orthostatic hypotension
5. hyperthermia
6. hypothermia

13. Neuroleptics cause extrapyramidal disorder on account of:
1. stimulation of motor zone in the cortex of cerebrum
2. excitation of N-cholinergic receptors of the skeletal muscles
3. enhancement of neuron-muscular transmission
4. block of dophaminergic receptors in basal nucleuses
5. block of serotonin receptors in striate body and substantia nigra

6. block of histamine receptors

14. Typical neuroleptics:
1. block dophaminergic receptors
2. excite dophaminergic receptors
3. inhibit autonomic reactions
4. have antipsychotic action
5. cause an increase in blood pressure
6. have an analeptic action

15. Primary effects of haloperidolum are:
1. antipsychotic
2. hypertensive
3. sedative
4. antiemetic
5. emetic
6. awareness-inducing

16. Neuroleptics are used for:
1. stimulation of higher nervous activity
2. treatment of psychosis
3. suppression of vomiting and hiccup
4. treatment of hepar and kidneys
5. treatment of parkinsonism
6. neuroleptanalgesia

17. Indications for prescription of neuroleptics are:
1. acute psychosis
2. hypertension
3. arrhythmia
4. epilepsy
5. parkinsonism
6. preanesthetic medication

18. For psychoses treatment are used:
1. Nitrazepamum
2. tincture Valerianae
3. Aminazinum
4. Medazepam
5. Haloperidolum
6. Pyracetamum

19. Neuroleptics in contrast to tranquilizers:
1. terminate psychomotor excitement
2. have sedative properties
3. suppress vegetative innervation
4. are used in the case of schizophrenia
5. act on GABA-receptors
6. do not cause addiction

20. Antipsychotic action of neuroleptics is due to:
1. block of the central dophaminergic receptors
2. block of adrenoreceptors
3. block of adrenoreceptors in the cortex of cerebrum
4. activation of GABA-receptors in the cortex of cerebrum
5. suppression of reticular formation
6. block of the central serotonin receptors

21. Droperidolum:
1. blocks dophaminergic receptors
2. is short-acting
3. potentiates action of narcotic drugs
4. causes an increase in blood pressure
5. is a tranquilizer
6. is a derivative of phenothiazine

22. Clozapine:
1. is a awareness-inducing agent
2. has antipsychotic properties
3. belongs to atypical antipsychotic agents
4. excites dophaminergic receptors
5. blocks dophaminergic D_2-receptors
6. is a derivative of benzodiazepine

23. Droperidolum:
1. is a neuroleptic, derivative of butyrophenone
2. is a derivative of substituted benzamides
3. is a narcotic, a derivative of phenantrene
4. belongs to group of tranquilizers
5. is used for neuroleptanalgesia
6. can cause convulsions

24. Sulpiride:
1. is an agent to treat parkinsonism

2. selectively blocks D_2-receptors
3. has antipsychotic properties
4. exerts antiemetic action
5. increases gastric secretion
6. is a neuroleptic

25. Neuroleptics are:
1. Medazepam
2. Chlorpromazine
3. Aminazinum
4. Fluphenazine
5. Diazepam
6. Phentanylum

26. Typical neuroleptics potentiate action of:
1. Coffeinum
2. Phenobarbitalum
3. Morphinum
4. Phthorothanum
5. Ephedrinum
6. Amitriptylinum

27. Anxiolytic effect are:
1. an increase in motor activity
2. a primary effect of tranquilizers
3. an increase in blood pressure
4. anxiolytic, antianxiety, antiphonic
5. antiemetic
6. the delay of labor

28. Tranquilizers are:
1. Chlozepidum
2. Haloperidolum
3. Diazepam
4. Phenazepamum
5. Chlorpromazini hydrochloridum
6. Natrii bromidum

29. Anxiolytics (tranquilizers) are:
1. Chlorpromazini hydrochloridum
2. Tramadolum
3. Diazepam

4. Phenazepamum
5. Haloperidolum
6. Mezapam

30. Tranquilizers are:
1. Droperidolum
2. Chlozepidum
3. Chlorprothixenum
4. Diazepam
5. Reserpinum
6. Mezapam

31. Diurnal tranquilizers are:
1. Chlozepidum
2. Mezapam
3. Gidazepamum
4. Diazepam
5. Clonazepamum

32. These drugs are used for treatment of neurosis:
1. Chlorpromazini hydrochloridum
2. Chlozepidum
3. Reserpinum
4. Phenazepamum
5. Haloperidolum
6. Diazepam

33. Tranquilizers:
1. block benzodiazepine receptors
2. excite benzodiazepine receptors
3. block opiate receptors
4. block GABA-receptors
5. are used in the case of neurosis
6. cause addiction

34. Side effects of tranquilizers are:
1. drowsiness
2. excitation of the CNS
3. development of tolerance
4. tachyphylaxis
5. addiction
6. hypertension

35. In response to administration of tranquilizers are observed:
1. reduction of delirium and hallucination
2. an acute fall in blood pressure
3. reduction of agitation, anxiety, and fear
4. relaxation of skeletal muscles
5. development of parkinsonism
6. development of tolerance

36. Tranquilizers:
1. cause muscle relaxation
2. have anticonvulsant potency
3. block dophaminergic receptors
4. are effective in the case of neurosis
5. cause hypothermia
6. interact with benzodiazepine receptors

37. Indication for prescription of Diazepam:
1. neurosis
2. impairment of consciousness
3. depression
4. insomnia
5. myasthenia
6. convulsive state

38. Tranquilizers are:
1. Mezapam
2. Chlozepidum
3. Phentanylum
4. Droperidolum
5. Sulpiride
6. Phenazepamum

39. Action spectrum of tranquilizers:
1. anxiolityc action
2. awareness-inducing
3. soporific effect
4. muscle relaxation
5. analgesic effect
6. analeptic effect

40. Anxiolytics (treanquilizers):

1. are effective in the case of neurosis
2. potentiate action of analeptics
3. are used for preanesthetic medication
4. are effective n the case of sleep disturbance
5. are used for neuroleptanalgesia
6. increase the tone of muscles

41. Tranquilizers exert such effects:
1. anxiolytic
2. analgesic
3. anticonvulsant
4. muscle relaxant
5. analeptic
6. sleep inducing

42. Important points in mechanism of action of tranquilizers:
1. stimulation of dophaminergic receptors in the reticular formation
2. interaction with benzodiazepine receptors
3. slackening of inhibitory processes in the brain
4. block of opiate receptors
5. an increase in sensitivity of GABA-receptors
6. opening of chloride ion channels and entry of Cl^-

43. These points are relevant to mechanism of action of tranquilizers:
1. stimulation of benzodiazepine receptors
2. block of benzodiazepine receptors
3. a decrease in synthesis of GABA
4. opening of chloride ion channels
5. block of sodium ion channels

44. Diurnal tranquilizers cause:
1. anxiolytic effect
2. adrenomimetic action
3. prominent antipsychotic action
4. weak hypnotic action
5. prominent hypnotic action
6. M-cholinoblocking action

45. Diazepam (Sibazonum):
1. excites benzodiazepine receptors
2. is used in the case of neurosis
3. is used in the case of psychosis

4. induces sleep
5. has muscle relaxing action
6. causes parkinsonism

46. Phenazepamum:
1. is a tranquilizer
2. exerts anticonvulsant action
3. blocks benzodiazepine receptors
4. excites benzodiazepine receptors
5. is an antagonist of morphinum
6. blocks dophamine receptors

47. Phenazepamum:
1. is a neuroleptic
2. exerts anticonvulsant action
3. is used in the case of neurosis
4. is an anxiolytic
5. excites CNS
6. causes insomnia

48. Mezapam:
1. is a diurnal tranquilizer
2. excites benzodiazepine receptors
3. blocks dophaminergic receptors
4. reduces emotional tension and fear
5. excites central adrenoreceptors
6. is an antagonist of aminazinum

49. Sedative drugs are:
1. Tinctura Ginseng
2. Tinctura Valerianae
3. Extractum Belladonnae siccum
4. Tinctura Leonuri
5. Extractum Leuzea fluidum
6. Extractum Eleutherococci fluidum

50. Sedative drugs are:
1. Natrii bromidum
2. Extractum Belladonnae siccum
3. Tinctura Valerianae
4. Tinctura Leonuri
5. Valocordin

6. Tinctura Ginseng

51. Sedative agents are:
1. Natrii bromidum
2. Extractum Rhodiolae fluidum
3. Extractum Valerianae
4. Tinctura Leonuri
5. Extractum Belladonnae siccum
6. Coffeinum-natrii benzoas

52. Bromine salts:
1. strengthen inhibitory processes in the brain
2. strengthen excitation processes in the brain
3. are neuroleptics
4. have antipsychotic properties
5. cause bromide-poisoning
6. are effective in treatment of hypertension

53. Natrii bromidum:
1. is a sedative action
2. is anxiolytic
3. is able to cumulate
4. may cause bromide-poisoning
5. may cause an increase on blood pressure
6. strengthens inhibitory processes in the brain

54. Bromine salts are used in the case of:
1. hallucinations and delirium
2. neurosis
3. psychomotor agitation
4. asthenia
5. parkinsonism
6. irritability

55. Medicines of Valeriana:
1. exert antipsychotic effect
2. exert sedative effect
3. cause addiction
4. cause an increase in blood pressure
5. strengthen conditioning
6. are used in the case of vegetative neurosis

56. Lithium salts:
1. have antidepressant effect
2. are used in the case of manic state
3. compete with natrium in the transport system of membrane
4. increase re-uptake of monoamines
5. have anticholinergic action
6. are substitutes for tranquilizers

P. W. 14.
Theme:
Psychostimulants. Antidepressants. Analeptics. Nootropic agents. Adaptogens.

General questions:

1. Psychostimulants: classification, pharmacodynamics of drugs.
2. Mechanism of action, pharmacological effects, therapeutic use, adverse effects of Coffeine.
3. Classification of analeptics. Comparative characteristics of analeptics. Pharmacokinetics, pharmacodynamics of analeptics.
4. Therapeutic use, adverse effects of analeptics and their correction.
5. Antidepressants: classification, comparative characteristics, mechanism of action, pharmacological effects, therapeutic use, adverse effects.
6. Nootropic drugs: classification, mechanism of action and influence on metabolic processes in the CNS, therapeutic use, adverse effects.
7. Pharmacological characteristics of adaptogens. Indications and contraindications to use.

Classification of Psychostimulating agents

I. Psychostimulants:

1. Pyrine derivatives: Coffeinum-natrii benzoas.
2. Phenilalkilamine derivatives:
   - Sydnocarbum
   - Phenaminum (Amphetaminum)
3. Piperidine derivatives:
   - Meridilum

II. Analeptics:

1. By their prior influence on the definite domain of the CNS:

Drugs that influence the brain cortex:

- Coffeinum-natrii benzoas

Drugs that influence the medulla oblongata:

- Aethimizolum
- Cordiaminum
- Camphora
- Sulfocamphocainum
- Bemegridum

Drugs that influence the medulla spinalis:

- Strychnini nitras

2. By their type of action:

Analeptics of direct action:

- Coffeinum-natrii benzoas
- Bemegridum
- Aethimizolum

Analeptics of reflexive action:

- Lobelini hydrochloridum
- Cytitonum

Analeptics of mixed action:

- Cordiaminum
- Carbogeni
- Sulfocamphocainum
- Camphora

III. Antidepressants:

1. Monoamine oxidase inhibitors (MAO inhibitors):

1.1. Non-selective MAO-inhibitors:

- Nialamidum

1.2. Selective MAO-inhibitors:

- Pirazidolum
- Moclobemidum (Aurorix)

2. Agents inhibiting neuronal reuptake monoamines (serotonine, noradrenaline):

2.1. Tricyclic antidepressants:

- Imizinum
- Amitriptylinum

2.2. Selective serotonine reuptake inhibitors:

- Fluxetinum (Prozak)
- Fluvoxaminum (Fevarinum)
- Sertralinum (Zoloft)

2.3. Selective noradrenaline reuptake inhibitors:

- Maprotilinum

IV. Nootropic agents:

1. Derivatives of pyrolidones (racetames):

- Pyracetamum (Nootropil)
- Ethyracetamum

2. Derivatives of GABA:

- Aminalonum
- Phenibutum
- Natrii oxybutiras
- Pantogamum

3. Neuropeptides and their analogs:
    - Synacten-depot
    - Thyroliberinum
4. Cerebrovascular drugs:
    - Nicergolinum (Sermionum)
    - Vinpocetinum (Cavintonum)
    - Pentoxyphyllinum (Trentalum)
    - Agapurinum
    - Xantinolum
    - Cinnarizinum (Stugeronum)
5. Derivatives of pyridoxine:
    - Pyritinolum
6. Antioxydants:
    - Tocopheroli acetas
    - Acidum nicotinicum
    - Mexidolum
    - Berlithionum
7. Drugs from other groups.

V. Adaptogenes:

- Tincture Ginsengi
- Tincture Echinaceae
- Tincture Schizandrae
- Extr. Leuzeae fluidi
- Extr. Eleutherococci fluidi
- Pantocrinum

Home task on prescription

Prescribe:

1. Coffeinum-natrii benzoas in tablets.
2. Solution of Camphora in ampoules.
3. Cordiaminum in vial.
4. Aethimizolum in ampoules and tablets.
5. Amitriptylinum in tablets.
6. Pyracetamum in ampoules and in tablets.
7. Pentoxyphyllinum in dragee.

CASE STUDY

Mary Smith is a 46-year-old secretary who complains to her primary care physician mainly of fatigue. She reports having low energy over the past 2 months and finding it more and more difficult to maintain her home and work responsibilities. Although tired, she is unable to sleep through the night and

awakens several times each night. Her appetite has been low and she has lost 10 pounds over this time. Her husband has noticed that she has lost interest in her hobbies and has withdrawn from their friends. He is concerned that she now has to bring office work home because her impaired attention and concentration make it impossible for her to complete her assignments during the workday. She expresses concern that she may not get better and has had thoughts of death but no actual plan or intent to end her life. She drinks no alcohol and doesn't use recreational drugs. Ms. Smith has one sister with a history of major depression, successfully treated with sertraline. Her mother was treated for depression with imipramine and phenelzine. Physical examination produces normal findings. Smith meets the DSM-IV criteria for major depression (depressed mood, loss of interest in pleasurable activities, decreased attention and concentration, fatigue, sleep disturbance, low appetite, weight loss, ideas of death). What pharmacological approach would you recommend?

Educational research work

Assignment 1.

Prescribe:

1. Coffeinum in ampoules.
2. Sulfocamphocainum in ampoules.
3. Fluvoxaminum in tablets.
4. Pentoxyphillinum in ampoules.
5. Vinpocetinum (Cavintone) in tablets.

Assignment 2.

Pharmaco-therapeutic task:

1. A derivative of nicotinic acid for stimulating of respiration and increasing of blood pressure.
2. An analeptic that has sedative action.
3. A tricyclic compound for treatment of depressive conditions.
4. An analeptic that influences the medulla spinalis.
5. Analeptics that influences the medulla oblongata.
6. An antidepressant selectively blocking the neuronal reuptake of serotonine.
7. A selective MAO-inhibitor.
8. Selective serotonine reuptake inhibitors.
9. Nootropic agent to improve memory and intellectual activity.
10. Psychostimulant of vegetable origin.

Assignment 3. *Individual work: fill in the table.*

Drugs	Dosage forms	Indication to use

Assignment 4.
*Choose **one** correct answer:*

1. The patient was admitted to the neurology department because of complaints of decrease of memory, mental and work capacity, sleeplessness and vertigo. His symptoms were connected to a brain concussion, which took place 2 years ago as a result of automobile accident. What drug should be indicated to improve this conditions?
A. Pyracetamum (Nootropilum).
B. Natrii oxybutyras.
C. Sydnocarbum.
D. Coffeinum.
E. Cordiaminum (nikethamide).

2. Indicate the drug which posseses analeptic and psychostimulant activity.
A. Coffeinum-natrii benzoas.
B. Bemegridum.
C. Aethimizolum.
D. Cordiaminum (nikethamide).
E. Strychnine.

3. A doctor administered amitriptyline to a patient with endogenous depression. Explain the mechanism of action of this drug.
A. Inhibition of the neuronal reuptake of noradrenaline.
B. Inhibition of the neuronal reuptake of serotonin.
C. MAO inhibitor.
D. Increase of release of noradrenaline and serotonin.
E. Inhibition of the neuronal reuptake of noradrenaline and serotonin.

4. A man was addressed to the psychiatrist with complaints of dreary spirits, feeling of hopelessness and desperation, tendency to suicide. Determine the group of drugs for the treatment of this patient?
A. Antidepressans.
B. Sedatives.
C. Neuroleptics.
D. Tranquilizers.
E. Lithium.

5. This drug is used for the treatment of disorders of memory, cerebral atherosclerosis, after cerebral injuries, alcohol encephalopathy, dementia. It improves the processes of memorizing and cognitivity. Determine this drug.

A. Amitriptylinum.
B. Pyracetamum.
C. Paracetamolum.
D. Bemegridum.
E. Sibazonum (diazepamum).

6. This group of drug includes psychotropic agents of plant origin. These drugs are used in asthenic states after severe infectious diseases. They increase general vital tonicity of the organism and its resistance to infectious diseases. These drugs are used in the form of tinctures or liquid extracts. Choose this group of drug.
A. Sedative.
B. Adaptogens.
C. Psychostimulants.
D. Antidepressants.
E. Nootropic agents.

7. During the operation under general anesthesia the patient's respration was inhibited. Specify, which breathing stimulant should be used in this situation without pausing the general anesthesia.
A. Aethimizolum.
B. Coffeinum.
C. Bemegridum.
D. Cytitonum.
E. Lobelini hydrochloridum.

8. A woman tried to commit suicide, her psychiatrist made the diagnosis of endogenic depression. What drug should be given for her treatment.
A. Sydnocarbum.
B. Nootropilum.
C. Amitriptylinum.
D. Aethimizolum.
E. Coffeinum.

9. A patient with respiratory depression has been delivered to a hospital. What is the pharmacological group of drugs that can stimulate breathing?
A. Neuroleptics.
B. Anxiolytic drugs.
C. Analeptics.
D. Antidepresants.
E. Analgetics

10. An elderly man complains of a headache, dizziness, rapid fatigability, memory impairment. In the anamnesis there is a craniocereberal trauma. What group of drugs is needed to be prescribed?
A. Neuroleptics.
B. Hypnotics.
C. Analgesics.
D. Nootropic drugs.
E. Anxiolytic drugs.

11. The patient was addressed to a doctor with complaints of tiredness, decrase of capacity for mental and physical work, worsening of mood. In examination the doctor revealed arterial hypertension and administered the drug from the group of psychostimulants. What agent is contraindicated in this situation?
A. Ginseng.
B. Coffeinum.
C. Phenaminum (amphetamine).
D. Nootropilum.
E. Sydnocarbum (mesocarbe).

12. What is the main mechanism of psychostimulant action of coffeinum?
A. Blockade of the adenosine receptors.
B. Agonist of M-cholinoreceptors.
C. Stimulation of opioid receptors.
D. Excitation of adrenoreceptors and dopamine receptors in the CNS.
E. Inhibition of alpha-adrenoreceptors.

13. The patient addressed to a doctor with complaints of bad mood, that was accompanied by expressed sedative action, feeling of fear, anxiety. The clinical examination revealed physical depression. What drug should be administered to this patient.
A. Droperidolum.
B. Aminazinum (chlorpromazine).
C. Coffeinum.
D. Amitriptylinum.
E. Ortophenum (diclofenac-sodium).

14. A patient with traumatic encephalopathy was admitted to the neurological department with complaints of disorders of memory, intellect, headache, vertigo. Choose the group of drugs for the treatment of the patient.
A. Psychostimulants.
B. Analeptics.
C. Nootropic agents (cognitive enhancers).

D. Antidepressants.
E. Adaptogens.

15. Specify the main effect of Pyracetamum (nootropilum).
A. Stimulation of myocardium activity.
B. Tranquilizing effect.
C. Inhibition upon excitation in the CNS.
D. Improves the processes of memorizing and cognitivity.
E. Decreases the neuronal stability to hypoxia.

16. This drug has stimulating action promoting synthesis of proteins and ATP, increases the capacity for physical and psychical work. It is used for a long time and it shouldn't be taken before sleep.
A. Tincture of Ginseng.
B. Tincture of Valeriana.
C. Barboval.
D. Nialamide.
E. Natrii bromidum.

17. It is necessary to prescribe a patient a drug, which improves memory and mental work in case of organic damages of the brain. What drug should be prescribed?
A. Nitrazepamum.
B. Pyracetamum.
C. Mezapamum.
D. Diazepamum.
E. Coffeinum-natrii benzoas.

18. The newborn child has asphyxia. What drug is it necessary to prescribe for the stimulation of breathing of the newborn?
A. Atropini sulfas.
B. Lobelini hydrochloridum.
C. Prasozinum.
D. Aethimizolum.
E. Proserinum.

19. An ambulance has delivered to a hospital a patient who tried to commit suicide in the condition of severe depression. The diagnosis: depressive psychosis. The drug of which pharmacological group is necessary to prescribe to the patient?
A. Anxiolytic drugs.
B. Sedatives.

C. Neuroleptics.
D. Antidepressants.
E. Salts of lithium.

20. A patient with complaints of memory impairment and intellectual work capacity decrease after a head trauma is hospitalized into a neurology department. What medicine can be recommended to improve brain tissues metabolism.
A. Pyracetamum.
B. Meridilum.
C. Sydnocarbum.
D. Coffeinum-natrii benzoas.
E. Analginum.

Assignment 5.
*Choose **all** correct answers:*

1. CNS-exciting agents are:
1. analeptics
2. antiparkinsonic agents
3. neuroleptics
4. dimethylxanthines
5. psychostimulants
6. analgesics

2. Psychostimulants:
1. elevate mood
2. cause limosis (good appetite)
3. cause drowsiness
4. cause psychomotor acceleration
5. increase mental and physical efficiency
6. increase the tone of bronchi

3. Psychostimulants:
1. elevate mood
2. cause psychomotor acceleration
3. increase mental and physical efficiency
4. intensify feeling of fatigue
5. cause a decrease in blood pressure
6. are used for treatment of manic state

4. Psychostimulants are:
1. Sydnocarbum

2. Coffeinum
3. Moclobemide
4. Pyrazidolum
5. Camphora
6. Meridilum

5. Psychostimulants are:
1. Diazepam
2. Meridilum
3. Coffeinum
4. Sydnocarbum
5. Amitriptylinum
6. Lithium salts

6. These drugs have psycho stimulatory properties:
1. Cordiaminum
2. Amitriptylinum
3. Sydnocarbum
4. Coffeinum
5. Aminazinum
6. Meridilum

7. Coffeinum has:
1. cardiotonic effect
2. immunosuppressive effect
3. psychostimulating effect
4. analeptic effect
5. neuroleptic effect
6. anxiolytc effect

8. Coffeinum:
1. stimulates excitative processes in the brain
2. slackens inhibitory processes in the brain
3. increase mental efficiency
4. blocks monoamine oxidase
5. blocks adenosine(purine) receptors
6. slackens cardiac performance

9. Coffeinum:
1. stimulates centers in the medulla oblongata
2. stimulates gastric secretion
3. inhibits gastric secretion

4. causes vasoconstriction
5. dilates cardiac vessels
6. inhibits synaptic transmission

10. Coffeinum is characterized by:
1. psychostimulation
2. slackening inhibitory processes in the brain
3. stimulation of gastric secretion
4. direct spasmolytic action
5. excitation of the centers in the medulla oblongata
6. inhibition of lypolysis

11. Coffeinum:
1. inhibits phosphodiesterase
2. activates adenylate cyclase
3. is a synthetic drug
4. is a derivative of xanthine
5. causes drowsiness
6. increase mental and physical efficiency

12. Coffeinum exerts such effects as:
1. sedative
2. direct spasmolytic
3. cardiotonic
4. psychostimulating
5. hypnotic
6. analeptic

13. In response on administration of coffeinum such alterations of blood pressure may be observed:
1. a decrease due to spasmolytic properties
2. an increase due to direct adrenomimetic action
3. a decrease due to inhibition of vasomotor centre
4. an increase due to direct spasmodic action
5. an increase due to cardiotonic action
6. an increase due to stimulation of vasomotor centre

14. Psychostimulating effect of coffeinum can be explained by:
1. block of adrenoreceptors
2. block of adenosine (purine) receptors
3. excitement of benzodiazepine receptors
4. inhibition of monoamine oxidase

5. stimulation of cortex of cerebrum
6. exciting of adenosine (purine) receptors

15. In mechanism of metabolic action such points are important:
1. inhibition of phosphodiesterase
2. storage of cyclic adenosine monophosphate in tissues
3. increases permeability of membranes for glucose
4. stimulation of glycogensynthetase
5. inhibition of lypolysis
6. stimulation of glycogenolysis

16. These drugs have adaptogenic activity:
1. Tinctura Ginseng
2. Extractum Rhodiolae fluidum
3. Tinctura Magnolia-vini
4. Extractum Belladonnae siccum
5. Tinctura Eleutherococci
6. Extractum Valerianae

17. These plants have adaptogenic activity:
1. deadly nightshade
2. Ginseng
3. foxglove
4. Rhodiola rosea
5. Leuzea
6. Valeriana

18. Adaptogenes are characterized by:
1. an increase of non-specific body resistance
2. an increase of adaptability
3. a decrease of body temperature
4. an increase of ganglion activity
5. are used for preventive health care
6. all drugs of this group are synthetic

19. An antidepressant, inhibitor of monoamine oxidase:
1. Coffeinum
2. Pyrazidolum
3. Imipraminum
4. Moclobemide
5. Nialamidum
6. Aminazinum

20. Nialamidum:
1. is an antidepressant
2. blocks re-uptake of monoamines
3. it is contraindicated to ingest together with cheese
4. irreversibly blocks monoamine oxidase
5. reversibly blocks monoamine oxidase
6. has sedative properties

21. Amitriptylinum:
1. is an antidepressant
2. has sedative properties
3. blocks monoamine oxidase
4. blocks re-uptake of monoamines
5. stimulates CNS
6. its structure is similar to that of Nialamidum

22. Tricyclic antidepressants are:
1. are derivatives of phenentrene
2. stimulate GABA-receptors
3. blocks re-uptake of monoamines
4. increase quantity of monoamines in synaptic cleft
5. decrease blood pressure
6. blocks monoamine oxidase

23. Antidepressants are:
1. Lithii carbonas
2. Imizinum
3. Diazepam
4. Fluoxetine
5. Amitriptylinum
6. Nicotinamid

24. Nootropic agents:
1. are effective in the case of memory impairment
2. are used for treatment of cerebrovascular accidents
3. stimulate mental performance
4. have analgesic properties
5. cause convulsions
6. do not penetrate hematoencephalic barrier

25. Nootropic agents are:

1. Pyracetamum
2. Aminalonum
3. Imizinum
4. Coffeinum
5. Cavinton
6. Nicergoline

26. Nootropic agents are:
1. Pyracetamum
2. Aminalonum
3. Amizylum
4. Nialamidum
5. Nicergolinum
6. Amitriptylinum

27. Nootropics:
1. improve memory
2. enhance blood circulation in the brain
3. increase ATP synthesis in the CNS
4. block GABA receptors
5. decrease processes of inhibition in the brain
6. decreases synthesis of macroergic phosphates

28. Pyracetamum (nootropil):
1. enhances mental performance
2. exerts antihypoxic effect
3. increases blood circulation in the brain
4. causes spasm of the vessels in the brain
5. may cause convulsions

29. Pyracetamum (nootropil):
1. its structure is similar to that of GABA
2. blocks monoamine oxidase
3. blocks phosphodiesterase
4. increases phospholipid synthesis in the neurons
5. increases brain metabolism
6. it does not cross blood-brain barrier

30. Indications for administration of the nootropics:
1. drowsiness
2. disturbances of the blood circulation in the brain
3. atherosclerosis of the brain vessels

4. history of the brain damage
5. depressions
6. bad mood

31. Which of the following drugs have an analeptic action?
1. Bemegridum
2. Aminazinum
3. Cordiaminum
4. Coffeinum
5. Pyracetamum
6. Diazepam

32. Analeptics:
1. cause excitation of the vital centers
2. are antagonists for anesthetic drugs
3. depress vital centers
4. are analeptic synergists
5. are substitutes for nootropics
6. enhance mental performance

33. Choose indications for administration of analeptics:
1. alcohol poisoning
2. bronchial asthma
3. barbiturate overdosing
4. grand mall seizures
5. preanesthetic medication
6. poisoning by the opioid analgesics

34. For respiratory center stimulation we would employ:
1. Camphora
2. Nialamidum
3. Cordiaminum
4. Bemegridum
5. Pyriditolum
6. Coffeinum

35. Which of the following are analeptics?
1. Bemegridum
2. Camphora
3. Cordiaminum
4. Diazepam
5. Theophyllinum

6. Strychninum

36. Camphora:
1. stimulates breathing
2. raises low blood pressure
3. stimulates cardiac performance
4. is a synergist of phenobarbitalum
5. exerts tranquilizing action
6. is an alkaloid

37. Indications for administration of analeptic:
1. alcohol poisoning
2. bronchial asthma
3. collapse
4. parkinsonism
5. carbon monoxide poisoning
6. respiratory arrest

38. Analeptics:
1. cause autonomic ganglions excitation
2. decrease blood pressure
3. cause excitation of the vital centers
4. depress pain sensitivity
5. are employed in the case of carbon monoxide poisoning
6. are employed in the case of asphyxia

P. W. 15.
Theme:
Vitamins drugs.

General questions:

1. Vitamins drugs. Classification, general characteristics.
2. Water-soluble vitamins. Pharmacology of Thiamini chloride, Riboflavine, Acide nicotinice, Calcii pantothenas, Pyridoxine hydrochloride, Cyanocobalamine, Acide folice, Calcii pantothenas, Acide ascorbinice, Rutine. Pharmacokinetics, pharmacodynamics, mechanism of action, therapeutic use, adverse effects.
3. Fat-soluble vitamins. Pharmacology of Retinole acetas, Ergocalciferole, Cholecalciferole, Tocopherole acetas, Vicasole. Pharmacokinetics, pharmacodynamics, mechanism of action, therapeutic use, adverse effects.
4. Polyvitamin drugs. Antivitamins.

Classification of Vitamins drugs:

I. Water-soluble vitamins drugs:

- Thiamini chloridum (vitamin drug of B_1)
- Riboflavinum (B_2)
- Acidum nicotinicum (B_3, PP)
- Calcii pantothenas (B_5)
- Pyridoxini hydrochloridum (B_6)
- Cyanocobalaminum (B_{12})
- Acidum folicum (B_9)
- Calcii pangamas (B_{15})
- Acidum ascorbinicum (C)
- Rutinum (vitaminum P)

II. Fat-soluble vitamins:

- Retinoli acetas (A)
- Ergocalciferolum (D_2)
- Cholecalciferolum (D_3)
- Tocopheroli acetas (E)
- Vicasolum (K)

Home task on prescription:

1. Thiamine chloride in tablets.
2. Pyridoxine hydrochloride in ampoules.

3. Acid nicotinic in tablets.
4. Cyanocobalamin in ampoules.
5. Acid acrobatic in dragee.
6. Retinol acetas in flacons.
7. Vicasolum in ampoules.
8. Isotonic solution of Sodium chloride in flacons.
9. Calcium gluconas in tablets.
10. Polyglucine in flacons.

Educational research work:

Assignment 1. *Prescribe:*

1. Riboflavin in tablets.
2. Thiamine chloride in ampoules.
3. Nicotinamide in ampoules.
4. Acid folic in tablets.
5. Acid ascorbinic in ampoules
6. Ascorutin in tablets.
7. Ergocalciferole in dragee.
8. Tocopherole acetas in capsules.
9. Calcium chloride in ampoules.
10. Magnesii sulfas in ampoules.
11. Glucosum in flacons.

Assignment 2. *Pharmaco-therapeutic task:*

1. A vitamin's drug for treatment of polyneuritis.
2. A vitamin's drug which posses antioxidant activity
3. A vitamin's drug for treatment of megablastic and macrocystic anemia.
4. A vitamin's drug which improves permeability of capillaries.
5. A vitamin's drug for prophylaxis and treatment of rachitis.
6. A vitamin's drug for treatment skin, cornea and retina diseases.
7. Isotonic solution of sodium chloride used in dehydration of the organism.
8. A drug used for correction of acid-base balance in respiratory acidosis.
9. Proteinase for treatment acute pancreasatitis.
10. Peptidases for treatment hypoacidic and anacidic gastritis.

Assignment 3. *Individual work.*

Drugs	Dosage forms	Indication to use

Assignment 4.
Choose one correct answer:

1. A patient, who has a mastectomy because of the mammary gland cancer, is prescribed a course of radiotherapy. What vitamin drug has antiradiation effect caused by antioxidant activity?
A. Cyanocobalaminum.
B. Ergocalciferolum.
C. Riboflavinum.
D. Tocopheroli acetas.
E. Acidi follicum.

2. Tetany has developed after thyreoidectomy. Using what drug is it possible to eliminate the problem?
A. Triiodothyroninum.
B. Calcii chloridum.
C. Mellictinum.
D. Calcitrinum.
E. Ergocalciferolum.

3. A 39-year-old man appealed to a hospital. Recently he noticed susceptibility to infectious diseases and impairment of twilight vision. During the examination a doctor diagnosed hyperkeratosis. What vitamin drug should be prescribed?
A. Pyridoxini hydrochloridum.
B. Retinoli acetas.
C. Riboflavinum.
D. Ergoealciferolum.
E. Tocopheroli acetas.

4. A patient came to a doctor with complaints of twilight adaptation impairment (night blindness). What vitamin drug is to be prescribed to the patient for the restoration of his sight?
A. Thiamini chloridum.

B. Vikasolum.
C. Pyridoxini hydrochloridum.
D. Retinoli acetas.
E. Tocopheroli acetas.

5. The deficiency of prothrombin in blood was detected during a preoperative examination of a patient. What drug is needed for the preliminary use by the patient for reducing blood loss during operation?
A. Phenylinum.
B. Thrombinum.
C. Acidum aminocapronicum.
D. Vicasolum.
E. Contrycal.

6. A patient who had been taking a vitamin drug for the prevention of cerebrovascular spastic reactions began to complain of unpleasnt feelings: hyperemia of the face and upper part of the body, vertigo, feeling of blood influx into the head. What drug may cause these side-effects.
A. Acidum nicotinicum.
B. Tocopheroli acetas.
C. Nicotinamidum.
D. Thiamini bromidum.
E. Calcii pangamas.

7. A patient had been taking vitamin D for a long time for treatment of rickets. Soon the signs of vitamin D intoxication developed: loss of appetite, nausea, headache, fatigue, increase of body temperature, etc. What vitamin decreasing the toxic influence of vitamin D should be administered?
A. Vitamin A.
B. Vitamin C.
C. Vitamin B1.
D. Vitamin PP.
E. Vitamin B6.

8. A 55 year old patient was admitted to the haemotological department with signs of acute anemia. After laboratory examination megaloblastic hyperchromic anemia was diagnosed. Which drug must be administered to the patient first of all?

A. Cyanocobaiaminum.
B. Vitamin B1.
C. Ferroplexum.
D. Ferrum-Lek
E. Acidum folicum.

9. A 55 year old patient suffering from hyperchromic anemia obtained long-term treatment with vitamin B12 parenterally. Why the parenteral way of introduction of vitamin B12 is prefered more than the peroral way?
A. It isn 't absorbed in the intestine in oral introduction due to deficit of gastromucoprotein.
B. It is faster absored.
C. It is longer circulated in the blood.
D. It is faster penetrated to the bone marrow.
E. It isn't destroied in the liver.

10. A patient has diarrhoea, dementia and dermatitis. What vitamin has to be included into the complex pharmacotherapy?
A. Nicotinic acid.
B. Thiaminum.
C. Cyanocobalaminum.
D. Panthotenic acid.
E. Riboflavinum.

11. There is an inhibited coagulation in the patient with bile ducts obstruction, bleeding due to the low level of absorbtion of a vitamin. What vitamin is in deficiency?
A. Vitamin K.
B. Vitamin D.
C. Carotin.
D. Vitamin.
E. Vitamin E.

12. Hydroxilation of endogenous substrates and xenobiotics requires a donor of protons. Which of the following vitamins can play this role?
A. Vitamin C.
B. Vitamin A.
C. Vitamin P.
D. Vitamin B6.

E. Vitamin E.

13. A patient suffers from chronic alcoholism with the following symptoms: pain in arms and legs, impairment of skin sensitivity, muscle weakness, edemas and increased amount of pyruvate. Which vitamin drug should be prescribed to the patient?
A. Ergpcalcipherolum.
B. Thiamini chloridum.
C. Retinoli acetas.
D. Rutinum.
E. Vicasolum.

14.Which of the acids below decreases permeability of connective tissue structures, possesses antioxidant activity due to ability to be transformed from the oxydized form into reduced and on the contrary?
A. Aspirinum.
B. Hydrochloric acid.
C. Mefenamic acid.
D. Ascorbinic acid.
E. Aminocapronic acid.

15. Radiation therapy is performed to the patient. What vitamin drug with antioxidant properties is necessary for administration to increase stability of tissues in this case?
A. Thiamini chloridum.
B. Vitamin B6.
C. Ascorutinum.
D. Cyanocobalaminum.
E. Acidum folicum.

16. The patient who was treated by a vitaminic drug for prophylaxis of vasospasms of the brain, has developed complaints of the unpleasant sensations related to taking of this medicine: reddening of the face and the upper half of a trunk, giddiness, sense of flush of blood to a head. For what drug the specified side-effects are characteristic?
A. Tocoferoli acetas.
B. Nicotinamidum.
C. Thiamini bromidum.
D. Acidum nicotinicum.

E. Calcii pangamas.

17. What vitamin promotes growth and development of epithelial cells, including epidermal ones?
A. Retinoli acetas.
B. Ergocalciferolum.
C. Acidum ascorbicum.
D. Acidum nicotinicum.
E. Lipoic acid.

18. To the child with signs of rachitis the pediatrist and the dentist administered a liposoluble vitamin which influences an exchange of phosphorus and calcium in an organism, promotes sedimentation of calcium in bone tissue and dentine. Determine a drug.
A. Retinoli acetas.
B. Tocoferoli acetas.
C. Ergocalciferolum.
D. Vicasolum.
E. Thyreoidinum.

19. A doctor administered tocoferol acetate to a patient with ischemic heart disease. What effect of a drug does the doctor expect?
A. Hypotensive.
B. Spasmolytic.
C. Antioxidant.
D. Increase of oxygen delivery to myocardium.
E Positive inotropic.

20. What enzymatic drug is used with the purpose of dropping of density and rising of permeability of connective tissue structures?
A. Amylasum
B. Lipasum
C. Carboxylasum.
D. Cholinesterasum.
E. Lidasum.

21. Cardiac arrhythmia, expressed muscle weakness, diarrhea, vomiting, impairment of vision, headache have developed to the patient under the

treatment by digitoxin. What drugs can attenuate the above-mentioned phenomena?
A. Drugs of potassium.
B. Drugs of calcium.
C. Iron preparations.
D. Drugs of sodium.
E. Drugs of magnesium.

22.Which of plasma substitutes listed below circulates in the blood for a long time?
A. Rheopolyglucinum.
B. 5 % Glucose Solution.
C. 0,9 % solution of Sodium chloride.
D. Ringer-Locke solution.
E. Polydesum.

Assingnment 5.

Choose all correct answers:

1. Which of the following vitamins are liposoluble?
1. Retinolum (vitaminum A)
2. Thiaminum (vitaminum B2)
3. Acidum nicotinicum (vitaminum PP)
4. Ergocalciferolum (vitaminum D)
5. Tocopheroli acetas (vitaminum E)
6. Acidum ascorbinicum (vitaminum C)
7. Vikasolum (vitamin K)
8. Riboflavinum (vitaminum B2)

2. Which of the following vitamins are water-soluble?
1. Thiaminum
2. Riboflavinum
3. Pyridoxinum (vitaminum B6)
4. Tocopheroli acetas
5. Ergocalciferolum
6. Acidum ascorbinicum
7. Acidum nicotinicum
8. Retinolum

3. Thiaminum
1. has an active form – thiamini biphosphas (Cocarboxylasum)
2. takes part in carbohydrate metabolism
3. takes part in nitrogen metabolism
4. takes part in mineral metabolism
5. is employed in the case of neuritis, paralysis
6. is employed in the case of arthritis, arthrosis

4. Pyridoxinum
1. takes part in protein metabolism
2. takes part in carbohydrate metabolism
3. takes part in mineral metabolism
4. increases synthesis of thiamin
5. is employed when isoniazidum is administered for long time in the case of tuberculosis
6. is used in hepatitis

5. Thiaminum
1. 50% contains in the heart
2. about 40% contains in the visceral organs
3. is phosphorilated in the microsomes
4. is phosphorilated in the hyaloplasm
5. is excreted with sweat
6. is excreted with feces

6. In pharmacodynamics of thiaminum we can outline such effects as
1. cardiotropic action
2. hypoglycemic action
3. influence on the kidneys
4. hepatotropic action
5. neurotropic action

7. Symptoms of chronic intoxication by vitamin D are following
1. stomachache
2. dyspepsia
3. hypertension
4. a decrease of visual acuity
5. hyperreflexia

8. Acidum ascorbinicum
1. when taken orally is absorbed in the intestines
2. is turned into dehydroascorbic acid which have vitamin activity
3. smoking inhibits conversion of ascorbic acid into non-active metabolites
4. is phosphorilated in microsomes
5. activates epinephros

9. Cyanocobalaminum
1. regulates hematopoiesis
2. promotes formation of epithelial cells
3. supports nervous system
4. stimulates growth and regeneration
5. in big doses inhibits insulin delivery
6. decreases vessels permeability

10. Indications for administration of cyanocobalaminum
1. megaloblastic anemia
2. disorders of the central and peripheral nervous system
3. disorders of the hepar
4. radiation disease
5. infectious diseases
6. dystrophy in children
7. powerless labor

11. Retinolum
1. is a water-soluble vitamin
2. is employed in hemeralopy (day blindness)
3. is produced from carotin in the intestines
4. stimulates epithelization, is used in the case of trophic ulcer
5. has a synonym ‘calciferol’
6. is used in rachitis

12. Ergocalciferolum
1. is a steroid
2. is produced in the colon due to microorganisms
3. is employed for prevention and treatment of rachitis
4. is an antioxidant

5. regulates calcium and phosphor metabolism
6. degrades when exposed to ultraviolet rays
7. in the case of overdosing may cause calcification of the vessels and cardiac valves

13. Acidum folicum
1. takes part in purine synthesis
2. takes part in pyrimidine synthesis
3. takes part in synthesis of cyanocobalamin
4. is employed in the case of malignant [pernicious] anemia
5. is used in the case of leucosis
6. takes part in carbohydrate metabolism

14. What is recommended to use in the case of neuritis or paralysis
1. Acidum ascorbinicum
2. Riboflavinum
3. Thiaminum
4. Retinolum
5. Ergocalciferolum
6. Pyridoxinum

15. Thiaminum
1. dilates coronary vessels
2. enhances glucose utilization
3. constrict peripheral vessels and dilates coronary vessels
4. causes rise in arterial blood pressure
5. enhances acetylcholine accumulation

16. Thiaminum
1. increase oxygenation of the heart
2. enhances impulse conduction
3. decreases glucose utilization
4. increase venous blood pressure
5. increases intraocular pressure

17. Acidum ascorbinicum
1. smoking speeds converting of ascorbic acid into non-active metabolites
2. alcohol speeds converting of ascorbic acid into non-active metabolites
3. is reabsorbed in the intestines

4. is activated by rutin
5. is phosphorilated in microsomes

18. Riboflavinum
1. increases resistance to hypoxia
2. increases growth and regeneration
3. supports organ of vision
4. promotes formation of the epithelial cells
5. supports nervous system
6. activates haemoglobin synthesis

19. Calcii pangamas
1. activates lipid metabolism
2. increases quantity of phosphocreatine in the hepar
3. decreases oxygen utilization
4. increases oxygen utilization
5. causes hypoxia
6. increases quantity of the glycogen in the hepar and muscles

20. Indications for the use of the calcii pangamas
1. hepar diseases
2. radiation disease
3. dystrophy of the myocardium
4. stenocardia
5. tropical sprue
6. chronic gastroenteritis

P. W. 16-17.
Theme:
Hormonal drugs.

General questions:

1. Pharmacology of hormonal drugs. Classification of hormones by the chemical structure.
2. Hypotathalamic hormones drugs: mechanism of action, therapeutic uses.
3. Pituitary hormones drugs (anterior and posterior): mechanism of action, therapeutic uses.
4. Thyroid hormones drugs: mechanism of action, pharmacologic effects, therapeutic uses, adverse effects.
5. Thyroid hormones inhibitors: therapeutic uses, adverse effects.
6. Parathyroid hormones: therapeutic uses, adverse effects.
7. Drugs used in diabetes mellitus: types of diabetes, insulinum and various types of insulin, therapeutic uses, adverse effects.
8. Oral hypoglycemic agents: classification, pharmacokinetics, mechanism of action, therapeutic uses, adverse effects.
9. Adrenal corticosteroids drugs and related agents: glucocorticoids, mineralocorticoids, mechanism of action, pharmacological effects, therapeutic uses, adverse effects.
10. Estrogens and antiestrogen drugs: therapeutic uses, adverse effects. Progestins and antiprogestine drugs: therapeutic uses, adverse effects.
11. Androgens and antiandrogens: mechanism of action, therapeutic uses, adverse effects.
12. Hormonal contraceptives: classification, mechanism of action, indication and contraindication to use, adverse effects.

Classification of hormones:

I. Hypotalamic hormones drugs:

- Sermorelinum (GHRH)
- Somatostatinum (SRIH)
- Ostreotidum
- Protyrelinum (Rifatyronum, TRH)
- Corticotropin releasing hormone (CRH)
- Gonadotropin-releasing hormone (GnRH)

- Prolactin-inhibiting hormone (PIH, Dopaminum)

II. Pituitary hormones drugs:

- Corticotropinum
- Somatotropinum
- Menotropinum
- Oxytocinum
- Vasopressinum
- Pituitrinum
- Adiurectinum

III. Thyroid hormones drugs and inhibitors:

- Levothyroxinum (α-Thyroxinum)
- Triiodthyroninum hydrochloridum
- Mercazolilum
- Propylthioracilum
- Radioactive iodine
- Sol. Lugoli

IV. Parathyroid hormones drugs:

- Parathyroidinum
- Calcitoninum

V. Pancreatic hormones drugs:

1. Insuline preparations:

Rapid acting:

- Insulinum pro injectionibus
- Suspension Zinc-Insulinum

Intermediate acting:

- Semilente Insulinum suspension

Prolonged acting:

- Ultralente Insulinum suspension

2. Glucagon.

VI. Oral hypoglycemic agents:

1. Sulfonylureas:

- Butamidum (Tolbutamidum)
- Chlorpropamidum
- Glibenclamidum
- Glipizidum
- Glimepiridum

2. Biguanides:

- Metforminum

3. Thiazolidinediones:

- Thioglutazonum
- Rosiglitazonum
- Pioglitazonum

4. α-Glucosidase inhibitors:

- Acarbosa
- Miglitolum

VII. Glucocorticoids:

- Hydrocortisoni acetas
- Prednisolonum
- Triamcinolonum
- Dexamethasonum
- Beclomethasoni dipropionas
- Synaflanum
- Flumethasoni pivalas

VIII. Mineralocorticoids:

- Desoxycorticosteroni acetas
- Fluorocortisonum

IX. Estrogens:

- Estradiolum
- Oestronum
- Synoestrolum
- Aethinylestradiol

Antiestrogens:

- Clomiphenum
- Tamoxifenum

X. Progestogens:

- Progesteronum
- Oxyprogesteronum caproas
- Pregninum

Antiprogestogens:

- Mifepristonum

XI. Androgens:

- Testosteronum
- Toestenatum
- Methyltestosteronum

- Antiandrogens:
- Cyproteronum
- Flutamidum

XII. Oral contraceptives:

1. Combination preparations:

- Logest
- Zanin
- Marvelonum
- Atenovinum
- Triregolum
- Trisistonum
- Continuinum
- Narcolutum

2. Postcoital drugs:

- Levonorgestrel
- Postinorum
- Mephipristonum

3. Local contraceptives:

- Pantetex
- Pharmatex

XIII. Anabolic steroids:

- Phenobolinum
- Retabolilum
- Methandrostenolonum

Home task on prescription:

1. Corticotropine in flacones.
2. Oxytocine in ampoules.
3. Triiodthyronine hydrochloride in tablets.
4. Insuline in flacones.
5. Glibenclamide in tablets.
6. Progesterone in ampoules.
7. Logest in dragee.
8. Testosteroni propionas in ampoules.
9. Phenoboline in ampoules.
10. Desoxycorticosteroni acetas in tablets.
11. Ointment of Flumethasoni pivalas.

Educational research work

Assignment 1. *Prescribe:*

1. Metformine in tablets.
2. Suspension of Zinc-Insuline in flacones.
3. Mercazolile in tablets.
4. Acarbosa in tablets.
5. Oxyprogesteroni caproas in ampoules.
6. Climonorm in dragee.
7. Retaboilile in ampoules.
8. Ointment of Hydrocortisoni acetas.
9. Prednisolone in tablets.
10. Desoxycorticosteroni acetas in ampoules.

Assignment 2. *Pharmaco-therapeutic task:*

1. Insuline preparations for the treatment of diabetic mellitus.
2. Oral hypoglycemic agents for treatment of non-insulin-dependent diabetes mellitus.
3. Anabolic steroid for the treatment of osteoporosis, fractures, eczema, psoriasis.
4. Thyroid hormones for the treatment of hypothyroidism (myxedema).
5. Hormones for the treatment of life-threatening shock, infection or trauma, inflammatory and allergic status.
6. A hormone for the treatment of hyperthyroidism.
7. A synthetic glucocorticoid to arrest bronchial asthma attack.
8. A natural progestational hormone to treatment amennorrhea, dysfunctional uterine bleeding, endometrial cancer.
9. Combination preparations which used for oral contraception.

Assignment 3. *Individual work.*

Drugs	Dosage forms	Indication to use

Assignment 4.

*Chooose **one** correct answer:*

1. A patient with hypothyroidism was treated with a drug — synthetic sinistrorotatory thyroxin isomer. The following concomitant complications

are possible: tachycardia, arrhythmia, trembling of the limbs. Which of the listed drugs has such action?
A. Retabolilum.
B. Ergocalciferolum.
C. Mercazolilum.
D. Levothyroxinum.
E. Prednisolonum.

2. Diabetic coma has been diagnosed. Concentration of sugar in blood is 18,44 millimole/l. What drug with glucose decreasing effect should be prescribed to this patient?
A. Insulinum of prolonged action.
B. Insulinum of average duration action.
C. Insulinum of brief action.
D. Metforminum.
E. Glibutidum.

3. A patient with rheumatoid arthritis had been taking glucocorticosteroid during several weeks. Then he suddenly stopped taking these drugs. What complication can occur in this case?
A. Hyperglycemia.
B. Hypertension.
C. Withdrawal syndrome.
D. Exacerbation of chronic infection processes.
E. Formation of ulcers on the mucous coat of the stomach and duodenum.

4. Because of a long-term application of a drug such complications as osteoporosis, erosive ulcers of the mucous coat of stomach, edemas, increase of arterial pressure, insomnia have developed. Laboratory tests detected hypernatremia, hypokalemia and hyperglycemia. What drug has been applied?
A. Digoxinum.
B. Hypothiazidum.
C. Prednisolonum.
D. Indometacinum.
E. Reserpinum.

5. The condition of a patient with diabetes worsened after a routine injection of insulin. There was anxiety, cold sweat, tremor of limbs, general

weakness, loss of consciousness. What drug is a pharmacological antagonist of insulin?
A. Adrenalini hydrochloridum.
B. Butamidum.
C. Coffeinum-natrii benzoas.
D. Noradrenalini hydrotartras.
E. Glibutidum.

6. An endocrinologist has prescribed glibenclamide to a patient with type II diabetes. What is the basic mechanism of this drug action?
A. Increasing of glucose metabolism.
B. Depression of gluconeogenesis.
C. Stimulation of insulin secretion by β-cells of Langerhans' islets.
D. Enchancement of glucose capture by peripheral tissues.
E. Activation of glucose transport into the cell.

7. Type II diabetes was revealed during an examination of a 70-year-old patient. What drug is expedient for use in this case?
A. Cortisonum.
B. Insulinum.
C. Mercazolilum.
D. Parathyreoidinum.
E. Glibenclamidum.

8. Having a serious infection a patient needs an anabolic drug for the improvement of appetite. Which one?
A. Heparinum.
B. Thiamini chloridum.
C. Tinctura Absinthii.
D. Retabolilum.
E. Acidi folicum.

9. A medicine was prescribed for the treatment of arthritis. It has the following pharmacological characteristics: it increases the production of lipomodu-line, reduces phospholipase A_2 activity, reduces the synthesis of arachidonic acid metabolism products (cyclic endoperoxides, prostaglandins). What drug is this?
A. Isadrinum.
B. Adrenalini hydrochloridum.

C. Prednisolonum.
D. Butadionum.
E. Glibenclamidum.

10. A drug oppressing enzymatic systems, participating in synthesis of hormones of thyroid gland was administered to a 47 years old patient, suffering from thyrotoxicosis. Indicate this drug.
A. Triiodthironini hydrochloridum.
B. Sol. Lugoli.
C. Mercazolilum.
D. L-Thyroxinum.
E. Radioactive iodine.

11. Specify a synthetic analogue of glucocorticoid hormones.
A. Prednisolonum.
B. Adrenalinum.
C. Pituitrinum.
D. Fluorocortisonum.
E. Testosteronum.

12. A woman, 28 years old, was admitted to a hospital in relation with danger of miscarriage. Earlier she had two cases of preliminary labor. Specify the drug of the hormone of corpus luteum that needs to be introduced in this case.
A. Progesteronum.
B. Synoestrolum.
C. Diazepamum.
D. Magnii sulfas.
E. Tocopheroli acetas

13. Specify the drug of posterior pituitary hormone applied to stimulation of labor activity of uterus.
A. Progesteronum.
B. Synoestrolum.
C. L-Thyroxinum.
D. Oxytocinum.
E. Salbutamolum.

14. What hormonal drug is used for treatment of diabetes insipidus?

A. Hydrocortisoni acetas.
B. Desmopressinum.
C. L-Thyroxinum.
D. Oxytocinum.
E. Insulinum.

15. Mercazolilum had been administered to the patient, suffering from thyrotoxicosis. What effect underlies antithyroid activity of a drug?
A. Depression of production of thyrotropic hormone.
B. Decrease of thyroid hormones production.
C. Depression of uptake of iodine by thyroid gland.
D. Destruction of cells of thyroid gland.
E. Oppression of metabolism in thyroid gland.

16. Insulin was introduced to the patient, suffering from diabetes mellitus. What is the main mechanism of action of this agent?
A. Oppression of giycogenesis.
B. Activation of glucose transport from blood to tissues.
C. Inhibition of transport of aminoacids.
D. Activation of synthesis of triglycerides.
E. Activation of glycogen synthesis.

17. The state of the patient, suffering from diabetes mellitus was worsened after the injection of insulin: general asthenia, cold sweat, tremor of extremities developed. What drug should be used in this situation?
A. Butamidum.
B. Hydrocortisoni acetas.
C. Glucosum.
D. Noradrenalini hydrotartras.
E. Metforminum.

18. Indicate the synthetic antidiabetic drug from the group of biguanide derivatives.
A. Butamidum.
B. Acarbosa.
C. Metforminum.
D. Glibenclamidum.
E. Glipizidum.

19. The doctor has administered an ointment containing glucocorticoid to the patient suffering from allergic dermatitis. The advantage of this drug is - it is not absorbed into the blood from the skin. Specify this drug.
A. Hydrocortisoni acetas.
B. Dexamethasonum.
C. Beclomethasoni dipropionas.
D. Flumethasoni pivalas.
E. Prednisolonum.

20. The patient of 45 years complains of constant thirst and expressed polyuria. The level of glucose in blood plasma is normal, and in urine glucose misses. What drug should be chosen for his treatment?
A. Insulinum.
B. Dexamethasonum.
C. Adiurecrinum
D. Hydrocortisoni acetas.
E. Prednisolonum.

Assignment 5.
Choose all correct answers:

1. Gonadotropinum menopausticum is used for
1. stimulation of sex hormones' synthesis the testicles and ovaries
2. to perform reproductive methods
3. to speed menopause
4. to delay menopause
5. to enlarger mammary glands

2. Human chorionic gonadotropin is used
1. in pituitary gigantism
2. to stimulate hair growth in the case of alopecia
3. hypogonadism in women caused by hypothalamic-pituitary insufficiency
4. hypogonadism in men caused by hypothalamic-pituitary insufficiency
5. pituitary dwarfism

3. Synthetic analogs of oxytocin are following
1. Desaminooxytocinum
2. Pituitrinum

3. Vasopressin
4. Adiurecrinum
5. Dinoproston

4. Desaminooxytocinum – a synthetic substitute of oxytocin is administered
1. transbuccally
2. transdermally
3. as an inhalation
4. in syrup
5. as powder

5. Hormones of which gland increase basal metabolism, oxygen consumption, body temperature, and degradation of proteins, lipids, and carbohydrates?
1. parathyroid gland
2. thyroid gland
3. pancreas
4. parotid gland
5. suprarenal gland

6. Thyroid insufficiency in childhood causes
1. cretinism
2. myxedema
3. gigantism
4. dwarfism
5. rachitis

7. Thyroid insufficiency in adults causes
1. obesity
2. depression
3. myxedema
4. hypotension
5. insomnia

8. Levothyroxine sodium is characterized by
1. onset of action develops slowly (8-10 days)
2. duration of action 2-4 days
3. onset on action is instant

4. duration of action 1-2 days
5. develops its action in 1-2 days

9. Triiodthyronini hydrochloridum is characterized by
1. onset of action develops in 1-2 days
2. it is 3-5 times more potent than levothyroxinum
3. onset of action is slow (8-10 days)
4. duration of action 2-4 weeks
5. it is 3-5 times less potent than levothyroxinum

10. In the case of myxedema coma we shall use
1. Vasopressin
2. Thyroxin
3. Thyrotropin
4. Mercazolilum
5. Triiodthyroninum

11. Choose an antidiabetic drug which decreases absorption of disaccharides in the intestines
1. glucagon
2. saccharose
3. glucose
4. insulin
5. Acarbose

12. Steroid estrogen preparations of natural origin are
1. Disethylstilboestrolum
2. Dimestrolum
3. Oestronum
4. Estradiol
5. Aethinyloestradiolum

13. Steroid estrogen preparations of synthetic origin are
1. Synoestrolum
2. Disethylstilboestrolum
3. Dimestrolum
4. Praegninum
5. Turinal

14. Estrogen antagonists are
1. Clomifene
2. Tamoxifenum
3. Oxyprogesteroni caproas
4. Praegninum
5. Turinal

15. Steroid gestagen preparations of natural origin are
1. Progesteronum
2. Oxyprogesteroni caproas
3. Praegninum
4. Turinal
5. Retabolil

16. Steroid gestagen preparations of synthetic origin are
1. Oxyprogesteroni caproas
2. Praegninum
3. Turinal
4. Phenobolinum
5. Synoestrolum

17. Antagonists of the gestagen receptors are
1. Phenobolinum
2. Retabolil
3. Mifepristone
4. Disethylstilboestrolum
5. Dimoestrolum

18. Antagonists of androgen receptors are
1. Cyproterone
2. Oxyprogesteroni caproas
3. Praegninum
4. Turinal
5. Phenobolinum

19. Agonists of androgen receptors are
1. Testosteroni propionas
2. Testenat
3. Methyltestosteronum

4. Phenobolinum
5. Retabolil

20. Choose drugs which have anabolic and small androgen effects

1. Phenobolinum
2. Retabolil
3. Synoestrolum
4. Methandrostenolonum
5. Postinor

P. W. 18-19.
Theme:
Pharmacology of anti-inflammatory agents. Antiallergic drugs. Immunotropic drugs

General questions:

1. Classification of anti-inflammatory agents. General characteristics.
2. Nonsteroidal anti-inflammatory drugs: classification, general characteristics of salicylates, derivatives of aniline, indolacetic acid, antranil acid, oxicames, sulphone acid, isonicotinic acid, coxibes.
3. Steroid anti-inflammatory drugs: classification, mechanism of action, therapeutic uses, adverse effects.
4. Immunopharmacology. Classification of drugs influence on immune system.
5. Antiallergic drugs: classification, general characteristics.
6. Pharmacology of H_1-receptor antagonists: generations, comparative characteristics, mechanism of action, therapeutic uses, adverse effects.
7. Immunodepressants: classification, mechanism of action, therapeutic uses.
8. Immunomodulating agents: classification, general characteristics, therapeutic uses. Interferons.

Classification of anti-inflammatory drugs:

I. Nonsteroid anti-inflammatory agents:

1. Salicylates (Salicylic acid compounds)

- Acidum acetylsalicylicum (Aspirin)

2. Pyrazolone compounds:

- Butadionum (Phenylbutazone)

3. Aniline (para-aminophenol) compounds

- Paracetamolum (Acetaminophenum, Panadolum)

4. Indol-acetic acid compounds:

- Indometacinum (Metindolum)
- Sulindacum

5. Phenyl-acetic acid compounds:

- Diclofenac-Natrium (Ortophen, Voltaren)
- Aceclofenac (Aceck)

6. Antranil acid compounds:

- Acidum mephenamicum (Ponstelum)
- Acidum fluphenamicum (Arlet)

7. Propionic Acid compounds

- Ibuprophenum (Bruphenum)
- Naproxenum (Naprosinum)
- Ketoprophenum (Ketonal)

8. Oxicam derivatives:

- Pyroxicamum (Felden)
- Meloxicamum (Movalis)
- Fenoxicamum (Tenoptyl)

9. Coxibes:

- Celecoxibum (Celebrex)
- Rofecoxibum
- Parecoxibum
- Valdecoxibum

10. Derivatives of isonicotine acid:

- Amizonum

II. Steroid anti-inflammatory agents (Glucocorticoids):

- Hydrocortisoni acetas
- Prednisolonum
- Methylprednisolonum
- Dexamethasonum
- Triamcinolonum
- Synaflanum
- Flumetasoni pivalas

Classification of antiallergic drugs:

I. Antiallergic drugs in immediate type of allergy:

1. Glucocorticoids:

- Hydrocortisoni acetas
- Prednisolonum
- Methylprednisolonum
- Dexamethasonum
- Triamcinolonum
- Synaflanum
- Flumetasoni pivalas

2. Xantines:
- Euphyllinum
- Theophyllinum

3. Membranes stabilizers:
- Cromolyn-Sodium
- Ketotiphenum

4. H_1-receptors blockers (antihistaminic drugs)

I generation
- Dimedrolum
- Diprazinum
- Suprastinum
- Diazolinum

II generation:
- Loratadinum (Claritinum)
- Terfenadinum
- Cetirizinum
- Astemizolum

III generation:
- Desloratadinum (Erius)
- Texofenadinum (Telfastum)

II. Antiallergic drugs in slowing allergy:

1. Non-steroid anti-inflammatory drugs.

2. Immunodepressants.

Classification of immunotropic drugs:

I. Immunosupressants (immunodepressants):

1. Corticosteroids.

2. Cytostatics:
- Cyclosporinum
- Tacrolimus
- Celcetum
- Azithioprinum
- Cyclophosphamidum
- Etanerceptum
- Leflunamidum
- Thalidomidum

3. Monoclonal antibodies:
- Muromonab

- Daclizumab
- Jufliximab

II. Immunoregulators (immunomodulators):

1. Thymus geanid drugs:
- Thymalinum
- Tactivimum
- Thymosinum

2. Immunopeptide drugs:
- Myelopidum
- Immunophanum

3. Interferons:
- Interferonum A
- Interferonum B
- Roferonum
- Laferonum
- Betaferonum

4. Interleukinum

5. Drugs microbial origin:
- BCG (Bacille Culmette-Guerin)
- Bronchoimunalum
- JRS-19
- Imudonum

6. Active compounds of plants:
- Extr. Echinaceae fluidum
- Extr. Rodiolae fluidum

7. Synthetic drugs:
- Amixinum
- Cycloferonum
- Levamisolum (Decaris)

8. Enzymes:
- Wobenzymum
- Flogenzymum

9. Vitamines (E, PP, A, C)

10. Immunoglobulines

Home task on prescription:

1. Acide acetylsalicilice in tablets.

2. Ibuprophene in dragee.
3. Diclofenac-natrii in ampoules.
4. Amizone in tablets.
5. Dimedrole in rectal suppositories.
6. Suprastine in ampoules.
7. Tavegile in tablets.
8. Ketotiphene in flacones.

Educational research work

Assignment 1. *Prescribe:*

1. Paracetamole in tablets.
2. Indometacine in dragee.
3. Celecoxibe in capsules.
4. Ointment of Hydrocortisone.
5. Prednisolone in ampoules.
6. Nimesulide in tablets.
7. Dimedrole in ampoules.
8. Diprasine in dragee.
9. Phencarole in ampoules.
10. Tactivine in flacones.
11. Loratadine in tablets.

Assignment 2. *Pharmaco-therapeutic task:*

1. An anti-inflammatory agent from the group of phenylacetic acid derivatives to the patient with arthritis.
2. An anti-inflammatory drug with antipyretic activity from the group of aniline.
3. Steroid anti-inflammatory agents for treatment of chronic polyarthritis.
4. Non-sedative H_1 –histamine receptor blockers for treatment allergic rhinitis.
5. An agent with immunomodulating activity for treatment of influenza.
6. Immunotropic drugs – immunodepressants for treatment of a patient with cytomegaloviral infection.
7. An analogue of natural glucocorticoid hormone for arrest of anaphylactic shock

Assignment 3. *Individual work.*

Drugs	Dosage forms	Indication to use

Assignment 4.

*Choose **one** correct answer:*

1. A 40-year-old woman appealed to a doctor with a complaint of pain in the knee joints. During examination the doctor revealed swelling, reddening, hyperthermia in these joints area. Laboratory tests showed positive acute phase reactants. What drugs have to be used for the treatment of the patient?
A. Narcotic analgesics.
B. Antiinflammatory agents of nonsteroid structure.
C. Antidepressants.
D. Antibiotics.
E. Sulfanamides.

2. A patient with rheumatoid arthritis had been taking glucocorticosteroid during several weeks. Then he suddenly stopped taking these drugs. What complication can occur in this case?
A. Hyperglycemia.
B. Hypertension.
C. Withdrawal syndrome.
D. Exacerbation of chronic infection processes.
E. Formation of ulcers on the mucous coat of the stomach and duodenum.

3. A 62-years-old man has been suffering from coxitis for a long time. A doctor prescribed him a new nonsteroid antiinflammatory agent celecoxib. It improved the patient's state. What is the advantage of this drug?
A. Depression of choline esterase.
B. Depression of phosphodiesterase.
C. Activation of adenylate cyclase.
D. Selective blockade of cyclooxygenase-2.
E. Activation of phosphodiesterase.

4. Allergic dermatitis produces itching, hypostasis, reddening, and insomnia. What drug is expedient for prescribing to the patient?
A. Dimedrolum.
B. Phenobarbitalum.

C. Nitrazepamum.
D. Chlorali hydras.
E. Natrii oxybutyras.

5. A patient has urticaria, which is treated with dimedrol. Which element of allergy pathogenesis is the therapeutic effect of dimedrol connected with?
A. Synthesis of immunoglobulins.
B. Histamine secretion.
C. Formation of the antigen-antibody complex.
D. Interaction of histamine with receptors in organs.
E. Activation of B-lymphocytes.

6. For treatment of joints arthritis a physician prescribed a drug which belongs to nonsteroid antiinflammatory medicines. It mainly influences cyclooxy-genase-2. It has no irritative influence on the mucous coat of the digestive system. What drug is it?
A. Indometacinum.
B. Celecoxibum.
C. Diclofenac-natrium.
D. Acidum acetylsalicylicum.
E. Ibuprofenum.

7. A second generation antihistaminic drug is a derivative of piperidine, taken once a day. It has no M-anti-cholinergic and adrenergic blocking effect. It shows antiallergenic, antiexudative, antipruritic action. What drug is this?
A. Retinoli acetas.
B. Dimedrolum.
C. Diazolinum.
D. Suprastinum.
E. Loratadinum.

8. A 40 year-old patient working as a driver suffers from chronic conjunctivitis of an allergic genesis. Which antihistamine drug should be administered to a patient, taking into account his profession?
A. Diazolinum.
B. Dimedrolum.
C. Diprazinum.

D. Suprastinum.
E. Ketotifenum.

9. After prolonged taking of a drug in relation with acute respiratory disease a patient began to complain of headache, vertigo, noise in ears, nausea, epigastric pain. Specify this drug that might cause such clinical picture.
A. Acetylsalicylic acid.
B. Vitamin C.
C. Prednisolonum.
D. Bromhexinum.
E. Midantanum.

10. Which drug is the most preferable for local treatment of allergic dermatitis?
A. Hydrocortisoni acetas.
B. Paracetamolum.
C. Furacilinum.
D. Methylsalicylas.
E. Ichthyolum.

11. The doctor has administered an ointment containing anti-inflammatory agent from the group of pyrazolone derivatives to the patient with arthritis of maxillofacial joint. What agent is contained in the ointment?
A. Butadionum.
B. Acidum mefenamicum.
C. Ibuprofenum.
D. Indomethacinum.
E. Diclofenac-natrium.

12. Indicate the drug from the group of nonsteroid anti-inflammatory agents which exerts the most prominent anti-inflammatory action in collagenoses?
A. Butadionum.
B. Aspirinum.
C. Ibuprofenum.
D. Indomethacinum.
E. Diclofenac-natrium.

13. Reduce of influence on which molecular substrate leads to decrease of ulcerogenic action of nonsteroid anti-inflammatory agents?
A. Cyclooxygenase-2.
B. Kallikreine.
C. Lysosomal enzymes.
D. Cyclooxygenase-l.
E. Adenylate cyclase.

14. The 63 years old patient with arthritis on a background of treatment by aspirin (acetytsalicylic acid) has complained of nausea, gravity in epigastrium. The doctor has abolished aspirin and has administered the anti-inflammatory agent from the group of selective COG -2 inhibitors. Indicate this drug.
A. Butadionum.
B. Diclofenac-natrium.
C. Indomethacinum.
D. Acidum mefenamicum.
E. Meloxycamum.

15. Indicate "day time" antihistaminic agent (with the least expressed sedative and hypnotic activity).
A. Dimedrolum.
B. Diprazinum.
C. Tavegilum.
D. Suprastinum.
E. Diazolinum.

16. A girl was treated with antibiotic from the group of semisynthetic Penicillins due to acute bronchitis. On the 3rd day of treatment allergic dermatosis has developed. Indicate an antiallergic drug which should be administered to the patient.
A. Suprastinum.
B. Analginum.
C. Aspirinum.
D. Biseptolum.
E. Mefenamic acid.

17. Indicate the group of antiallergic agents to which loratadine belongs.
A. Glucocorticoids.

B. Membrane stabilizers.
C. Antagonists of leucotriene receptors.
D. Blockers of histamine receptors.
E. Blockers of serotonine receptors.

18. The immunodepressive effect of Prednisolone is caused by:
A. Inhibition of protein synthesis due to activation of gluconeogenesis.
B. Inhibition of collagen synthesis.
C. Activation of synthesis of inhibitors of proteases.
D. Inhlbition of synthesis of mucopolysaccharides.
E. Diminution of activity of pfasmin.

19. A 48 years old woman who is suffering from exacerbation of chronic pneumonia requires treatment with immunostimulant agent. Indicate this drug.
A. Sulfocamphocainum.
B. Thymalinum.
C. Biseptolum.
D. Dimedrolum.
E. Levamisolum.

20. Indicate the immunostimulant drug which is also well known as anthelmintic agent.
A. Levamisolum.
B. Interferonum.
C. Methyluracilum.
D. Pyrantelum.
E. Natrii nucleinas.

Assignment 5.
*Choose **all** correct answers:*

1. Which of the following are steroidal anti-inflammatory drugs?
1. Acidum acetylsalicylicum
2. Betamethasonum
3. Prednisolonum
4. Indometacinum
5. Flumethasoni pivalas
6. Celecoxib

2. Which of the following are nonsteroidal anti-inflammatory drugs?
1. Betamethasonum
2. Nimesulidum
3. Indometacinum
4. Dexamethasonum
5. Meloxicam
6. Prednisolonum

3. Anti-inflammatory action of the glucocorticoids is due to
1. Inhibition of the COX-1
2. Inhibition of the phospholipase A2
3. Inhibition of the COX-2
4. Inhibition of the lypocortins
5. Activation of the lypocortins of leucocytes and activation of the phospholipase A2
6. Activation of the phospholipase A2

4. Steroidal and nonsteroidal anti-inflammatory drugs inhibit
1. phospholipase A2
2. synthesis of arachidonic acid
3. both COX-1 and COX-2
4. selectively COX-1
5. phospholipase A2 and COX
6. synthesis of activation inflammatory mediators

5. Steroidal and nonsteroidal anti-inflammatory drugs
1. inhibit phospholipase A2 and COX
2. stimulate synthesis of phospholipase A2 and COX
3. inhibit synthesis of arachidonic acid
4. activate synthesis of prostaglandins and leukotrienes
5. stabilize lysosome membranes and prevent delivery of the protein-degrading enzymes
6. increase sensitivity of the tissue receptors

6. Main properties of nonsteroidal anti-inflammatory drugs
1. immunodepressive action
2. analgesic action
3. anti-inflammatory action

4. antihistaminic action
5. antipyretic action
6. all nonsteroidal anti-inflammatory drugs inhibit aggregation

7. On the place of inflammation steroidal anti-inflammatory drugs
1. increase exudation
2. decrease activity of the macrophages and fibroblasts
3. increase sensitivity of the tissue receptors
4. decrease sensitivity of the tissue receptors to the inflammatory mediators
5. block adhesion and migration of the leucocytes
6. delate capillaries
7. have an anti-proliferative a action

8. Indications for use of prednisolonum
1. diabetes mellitus
2. gastric ulcer
3. hypertensive crisis
4. anaphylactic shock
5. collagenoses
6. bronchial asthma

9. Indications for use of nimesulidum
1. vasomotor rhinitis
2. gastric ulcer
3. rheumatoid joint inflammation
4. exacerbation of gout
5. fever
6. anaphylactic shock

10. Undesirable effects of steroidal anti-inflammatory drugs usage are
1. hyperglycemia
2. decreased resistance of the organism to infections
3. increased immunity
4. hypotension
5. hypoglycemia

11. Steroidal anti-inflammatory drugs are following
1. Diclofenac-natrium

2. Naproxenum
3. Beclometasoni dipropionas
4. Triamcinolonum
5. Nimesulidum
6. Synaflanum

12. Nonsteroidal anti-inflammatory drugs
1. Diclofenac-natrium
2. Triamcinolonum
3. Acidum mephenamicum
4. Naproxenum
5. Amizonum
6. Betamethasonum

13. Anti-inflammatory action of glucocorticoids is due to
1. ability to influence synthesis of inflammatory mediators
2. ability to influence vessels and proliferation
3. inhibit synthesis of arachidonic acid
4. inhibit synthesis of cyclooxygenase
5. stabilization of lysosome membranes
6. ability to activate synthesis of prostaglandins

14. Action of the nonsteroidal anti-inflammatory drugs is due to
1. activation of cyclooxygenase
2. inhibition of cyclooxygenase
3. inhibition of hyaluronidase and a decrease of vessel's permeability
4. modification of substrate of inflammation
5. activation of leukotrienes and prostaglandins synthesis
6. stimulation of ATP synthesis

15. Both analgesic and anti-inflammatory properties have
1. Prednisolonum
2. Naproxenum
3. Triamcinolonum
4. Nimesulidum
5. Diclofenac-natrium
6. Betamethasonum

16. Main properties of steroidal anti-inflammatory drugs are following

1. immunodepressive
2. desensitizing action
3. antipyretic action
4. analgesic
5. antishock action
6. hyperglycemic

17. In the place of inflammation glucocorticoids
1. inhibit phospholipase A2
2. activate phospholipase A2
3. dilate vessels and increase migration of leucocytes
4. inhibit proliferation
5. inhibit exudation
6. inhibit alteration

18. Indications for use of beclometasonum
1. allergic rhinitis
2. bronchial asthma
3. acute rhinitis
4. pharyngitis
5. tracheitis
6. pneumonia

19. Indications for use of indometacinum are following
1. contact dermatitis
2. ankylosing [rheumatoid] spondylitis
3. prevention of withdrawal syndrome after continuous administration of glucocorticoids
4. aggravation of gout
5. eczema
6. rheumatoid joint inflammation

20. Undesirable effects of glucocorticoid administration are following
1. osteoporosis
2. obesity
3. hypotension
4. withdrawal syndrome
5. angioneurotic edema
6. leukocytosis

7. short breath