Case №1

At the figure 1. you can see dependence of concentration and effect of two drugs (A and B). What conclusions can you make while comparing them in terms of activity and effectiveness? Explain your answer.

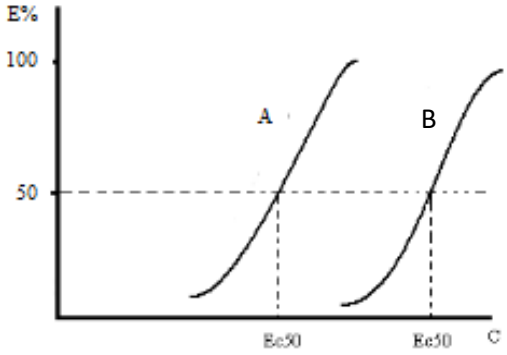


Fig 1. "Concentration - effect" of drugs A and B.

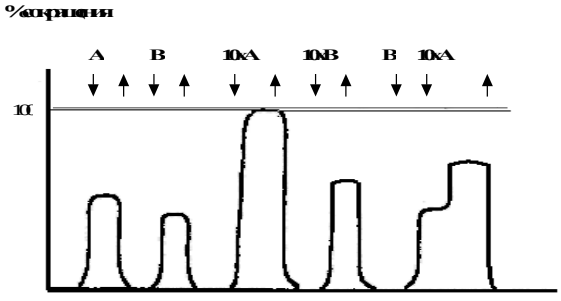
1. A is more active than B.
2. B is more active than A.
3. A is more effective than B.
4. B is more effective than A.
5. The drugs are equiefficient.

Case №2

Indicate the part of drug **X** (weak acid with **pKa=7.4**) that will be absorbed from the duodenum (**pH 7.4**) into the blood (**pH=7.4**). Explain your answer.

Case №3

The figure shows a kymogram of contractions of the isolated rat intestine in response to two drugs (A and B). After analyzing the data in the figure, name the drug that is a <u>full agonist</u>. Explain your answer.



Note: ↓10xA, 10xB - addition of drugs A and B in a tenfold concentration.

Case №4

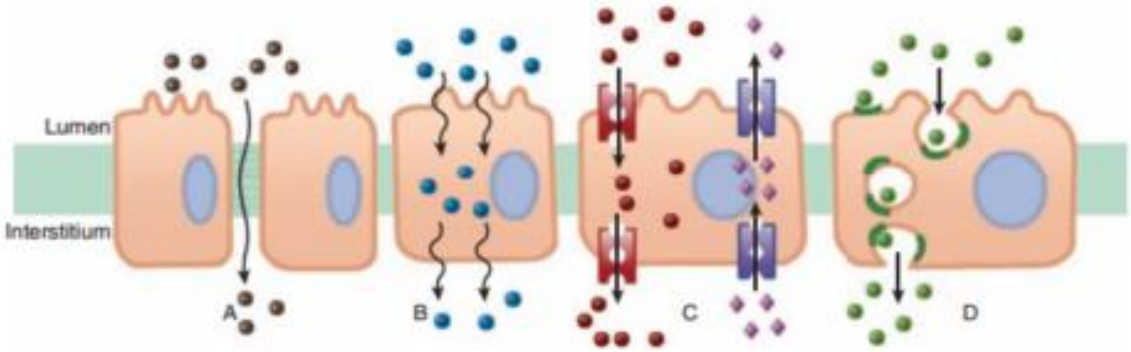
A 45-year-old woman was diagnosed with lupus. The oral treatment with a glucocorticosteroid drug was started. What is the most likely time interval expected between receptor activation and therapeutic effect? Explain your answer.

1. A few milliseconds. 2. A few seconds. 3. A few minutes.

4. Less than an hour. 5. Several hours or days.

Case №5

Using the picture, identify the types of drug permeation depicted on it. Explain your answer.



Case №6

A doctor prescribed a medicine for a patient with atony of the bladder, the dose of which the patient independently exceeded. Urination returned to normal, but following symptoms has appeared: miosis, sweating, profuse salivation, vomiting, diarrhea, bradycardia, and muscle cramps.

1. Drug from which group was prescribed to the patient?
2. What is the main cause and mechanism of developing those side effects?
3. List the drugs from this group.

Case №7

A patient suffering from dementia due to Alzheimer's was prescribed a course of treatment with anticholinesterase drug. In the process of therapy, he noted a slight improvement in

memory, attention and speech. However, after some time, visual disturbances, sweating, frequent stools, arrhythmia, muscle twitches began to disturb.

1. What drug was prescribed to the patient?
2. What is the mechanism of its action?
3. List the drugs from this group.

Case №8

A 10-year-old boy with an acute poisoning was taken by an ambulance to emergency treatment. The child complained on severe spastic pains in the abdomen, tightness in the chest, a feeling of lack of air, profuse salivation and lacrimation. According to his grandmother he had vomiting and diarrhea for several times. The boy arrived two days ago to the village to visit his relatives. This morning, he actively helped his grandfather to treat trees in the garden with a solution against insect pests. After dinner, he felt unwell and chilled. By evening, relatives sought medical help due to a deterioration in his condition. Body temperature 38.5 C, BP 90/65, heart rate 50 per minute, respiratory rate 22 per minute. On examination by a doctor revealed: a significant constriction of the pupils, hyperemia of the conjunctiva, moist hot skin, shortness of breath, bradycardia, arterial hypotension.

1. To which group of drugs does this insecticide belong to according to the mechanism of action?
2. What is the cause of these symptoms of poisoning?
3. Name the drugs used for this poisoning and explain the mechanisms of their action

Case №9

Doctor prescribed drug to a patient with acute hepatic colic. The attack was stopped, but the patient started to complain on a heartbeat, dry mouth, and visual impairment.

1. What are the causes of following symptoms?
2. Which group of drugs can lead to them?
3. List the drugs from this group.

Case №10

A patient, that suffers from dysuria and urinary incontinence for was prescribed M-Cholinoblocker(ChB) drug. After a while, the patient's condition improved significantly, the frequency of urging to urinate decreased, but headache, dry skin, constipation, and accommodation disorders appeared.

1. Which M- ChB was assigned to the patient?
2. Explain the mechanism of action of the drug and pharmacological effects.
3. List the drugs from tis group.

Case №11

M-Cholinoblocker was administrated into the conjunctival sac of the patient due the examination of the ocular fundus. The doctor warned the patient that he would not be able to read and write for a week.

1. What drug was administered to the patient?
2. Explain the mechanism of its action on the eye.
3. Which M-anticholinergic drugs have a shorter effect on the eye?

Case №12

Doctor prescribed neostigmine to a patient with atony of the bladder, the dose of which the patient arbitrarily exceeded.

1. What drug should be used to eliminate the symptoms of neostigmine overdose?
2. Name his group and explain the principle of action.

Case №13

A patient suffering from COPD was prescribed drug therapy for restore bronchial patency and prevent airway obstruction. As a result of the therapy, shortness of breath and cough were significantly reduced, the patient's well-being improved.

1. Which M-cholinoblockers were used in this situation?
2. Justify their advantage over other drugs in the group.
3. What side effects are possible with their use?

Case №14

A patient with a seasickness will have a long journey on a ship.

1. What medications can the doctor recommend to him in this situation?
2. Explain why?

Case №15

The patient underwent a long surgical operation under endotracheal anesthesia using peripheral muscle relaxant. The operation was successful, however, spontaneous respiration was fully restored only after neostigmine administration.

1. What is the mechanism of action of the muscle relaxant, that was used during anesthesia?
2. What is the purpose of neostigmine use in this case?

3. List the drugs from this group.

Case №16

Patient A, suffering from glaucoma, was prescribed a drug that reduces intraocular pressure, causes mydriasis and slight changes in accommodation. Patient B who also received treatment for glaucoma, was prescribed a drug that reduces intraocular pressure, causes myosis and accommodation spasm.

1.Which groups of drugs do these patients use?

2. List drugs from those groups.

Case №17

A patient suffering from rhinitis for a long time consulted a doctor with complaints of nasal congestion, frequent violation of nasal breathing, which persists despite regular use of local vasoconstrictor drugs.

1. Which drug patient had used for a long time for rhinitis?
2. To which group it belongs to?
3. What recommendations should the doctor give the patient in this situation?

Case №18

A patient with benign prostatic hyperplasia (BPH) was prescribed a drug for prolonged conservative therapy, after which the patient felt nauseous, dizzy, and severe weakness. The measuring of blood pressure revealed arterial hypotension.

1. What drug was prescribed to the patient?
2. What pharmacological group does it belong to?
3. What is the reason for the described adverse reactions?
4. Which drug is preferable to recommend to the patient?
5. Justify the use of drugs of this group for BPH.

Case №19

The musician was taken from the concert hall to the intensive care with an asphyxia. The examination revealed the following symptoms: arterial hypotension, bradycardia, atrioventricular block. From the patient's story, it turned out that he had taken several pills in order to remove the excitement and tremor that occurs before the performance.

1. The drug from which group could the patient take?
2. What is the cause of the adverse reactions? Justify your answer.

Case №20

At the figure 1 you can see the result of the interaction between drug X (small doses) and acetylcholine (effect on blood pressure).

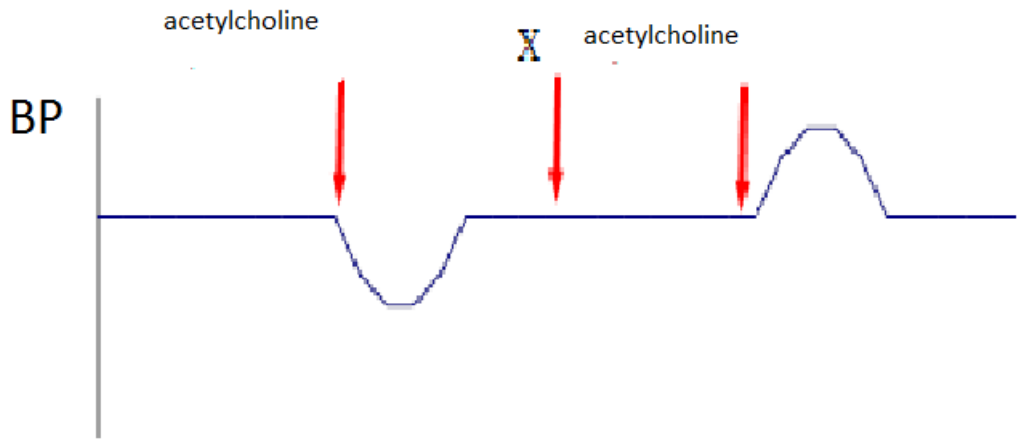


Fig.1. Effect of Acetylcholine and its combination with drug X on blood pressure

1. Name the drug X. What pharmacological group does it belong to?
2. Explain the mechanism of development of the hypotensive action of acetylcholine?
3. Why does acetylcholine increase blood pressure when its used in combination with drug X?

Case №21

At the figure 1 you can see the result of the interaction between adrenomimetic drug adrenaline and adrenoblocker X (effect on blood pressure).

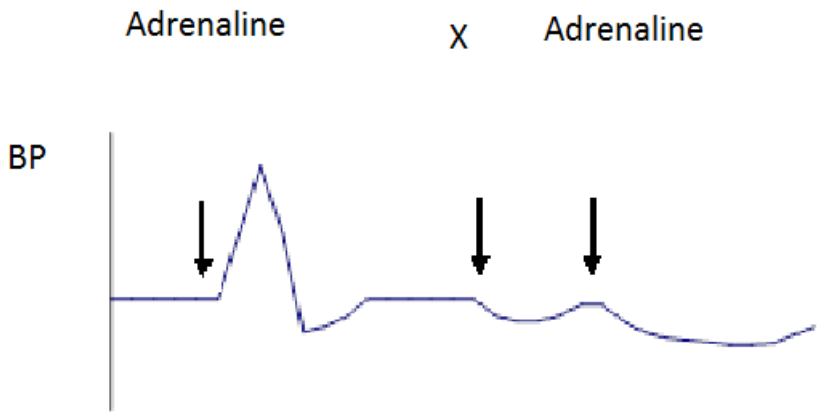


Figure 1. Effect of Adrenaile and its combination with drug X on blood pressure

1. Name the drug X.
2. What pharmacological group does it belong to?
3. Why is there a perversion of the hypertensive effect of adrenaline during the administration of drug X?

Case №22

A patient with rheumatoid arthritis had been treated with an anti-inflammatory drug for a long time. He began to notice irritability, sleep disturbances, increased blood pressure, swelling in the legs, epigastric pain, and weight gain. He decided to stop taking pills without asking his physician, suddenly his condition began to get worse: severe muscle weakness, nausea, lethargy, vomiting appeared, and blood pressure dropped.

1. The drug from which group could the patient receive?

2. List all the drugs of this group

3. What is the reason for the deterioration of the patient's condition and how can his physician help him?

Case №23

A 40-year-old patient suffering from peptic ulcer was admitted to the hospital with gastric bleeding. From the anamnesis it became known that 7 days ago he fell ill with the flu and took the drug X in order to low the temperature.

1. To which class of drugs can the drug X belong to?
2. List the drugs from that class.
3. What mechanism underlies in peptic ulceration and bleeding

Case №24

A 2-year-old child with a viral infection was given an antipyretic drug **X** by his mother. In a time, Reye's syndrome has developed to the child.

1. What drug could provoke that syndrome?
2. What class does this drug belong to?
3. What other side effects does this drug have?

Case №25

A patient who was often bothered by epigastric pains and epigastric burn for a long time took the drug X to relieve symptoms, without consulting with a doctor. For a short time, the pains disappeared, but then he began to burp air ("champagne phenomenon"). Recently, bloating began to disturb him, swelling has appeared, and he felt not well generally. The patient was hospitalized. Upon examination, the metabolic alkalosis was revealed.

1. What drug did the patient take to relieve pain and epigastric burn?
2. What is the reason for the deterioration of his condition?
3. What can be recommended to him in this case?

Case №26

A 35-year-old patient has been suffering from duodenal ulcer for 7 years. The last week he felt severe epigastric pain, that got worse at night, heartburn. During esophagogastroduodenoscopy (EGD), an ulcerative defect of the duodenal mucosa was detected, and by biopsy the presence of H. pylori was detected.

1. What drugs, along with antibiotic therapy, are indicated to the patient?
2. What groups do the drugs you mentioned belong to?
3. What are the mechanisms of action of these drugs?

Case №27

After taking an antibiotic from penicillin group, the patient experienced a sharp decrease in blood pressure, shortness of breath, and convulsions. He lost consciousness. Anaphylactic shock has developed

1. What drugs should be given to the patient to stop the condition?
2. What pharmacological groups do they belong to?
3. What mechanisms of action of these drugs lead to the relief of anaphylactic shock?

Case №28

A 35-year-old patient with a toothache decided to listen to friends advice and without going to a dentist took the pill for pain relief several times a day. After 5 days of treatment, he began to notice a sour taste in the mouth, a burning sensation behind the chest, epigastric pain.

1. The drug from which group could the patient use?
2. List all the drugs from this group.
3. Explain the mechanism of adverse effects.

Case №29

The patient suffered from rhinitis for a long time during the flowering period of the plants. In the last two years in the spring he had attacks of dyspnea, breathlessness, accompanied by wheezing. During the examination bronchial asthma was diagnosed.

1. What drugs should be prescribed to a patient for the prevention of this disease in the spring?
2. What pharmacological groups do they belong to?
3. What side effects can be expected with their use?
4. Which drugs can be prescribed for a patient to stop acute attacks of BA?
5. What groups do they belong to? Name their side effects.

Case №30

The patient, 70 y.o. was admitted to the emergency with complaints of pain and swelling in the lower third of the forearm, as well as the inability to move in the wrist joint. During the examination it became clear that the patient is suffering from rheumatoid arthritis, thus for is receiving therapy with glucocorticoids. In X-ray examination, the diagnosis of a

fracture of the forearm bones in the area of the wrist joint, as well as osteoporosis were made.

1. What main drugs can be used in this case?
2. What are their mechanisms of action?
3. What side effects are possible with their prescription?

Case №31

An ambulance has arrived on call to a 14-year-old patient. Examination revealed: the patient is inhibited, answers monosyllabic, chapped lips, dry mouth, tendon reflexes are reduced, heart rate is increased, blood pressure is reduced, the smell of acetone in exhaled air. Diabetes and hyperglycemic coma were diagnosed.

1. Which drug is used for treatment of hyperglycemic coma?
2. What effects of this drug are relevant in this situation?
3. What side effects are possible with its use?

Case №32

Patient A. came to the endocrinology center with complaints of irritability, tearfulness, fever, sweating, weight loss, palpitations, and increased blood pressure. Examination revealed an increase in systolic blood pressure and a decrease in diastolic blood pressure, tachyarrhythmia, exophthalmos, and tremor of the hands. Thyrotoxicosis was diagnosed.

1. Which drugs are used to treat hyperthyroidism (overactive thyroid)?
2. What side effects are possible with their prescription?

Case №33

To a patient who admitted to the hospital with myocardial infarction, was diagnosed heart failure that was complicated by ventricular tachyarrhythmia.

1. What antiarrhythmic drugs can be prescribed to the patient?
2. What are the classes of antiarrhythmic drugs they belong to?
3. What is their influence on the main parameters of the activity of the heart?

Case №34

The patient with angina pectoris felt acute pressing pain behind the chest and took several tablets of the drug. The pain attack has passed, but dizziness and weakness immediately appeared, and the patient lost consciousness. At measurement of blood pressure the acute hypotension has revealed.

1. Which drug took the patient?
2. What was the cause of this side effect and how it can be prevented?

Case №35

A patient with arterial hypertension, who takes diuretics for a long time, complains about the following symptoms: tachycardia, muscle spasms, headache, nausea. During the examination, the patient was diagnosed with hypercalcemia.

1. Which group of diuretic drugs can cause these side effects?
2. Name diuretics, that belong to this group?
3. What conclusion can we make based on these side effects?
4. How to prevent these side effects?

Case №36

An antihypertensive drug was prescribed to a patient with arterial hypertension, which kept his pressure normal. However, soon he started to complain on persistent dry cough, a skin rash and a taste change.

1. The drug of which group of antihypertensive agents could the patient take?
2. List the representatives of this group.
3. What are the mechanisms of their antihypertensive action?

Case №37

A 58-year-old patient suffering from gastric and duodenal ulcer after myocardial infarction was prescribed an antithrombotic drug to prevent recurrent infarction. 3 weeks after the start of treatment, the patient went to the doctor with complaints on epigastric pain and dyspeptic disorders. A diagnosis of peptic ulcer in the acute stage was made.

1. What drug was prescribed to the patient?
2. Which group does this drug belong to?
3. What is the mechanism of its action?
4. What other side effects are possible with its use?

Case №38

The patient with CHF in the compensation stage came to the dentist with complains about the toothache. At the moment of removal of the tooth, a fainting has developed, also tachycardia and dyspnea. To prevent the development of acute heart failure, the patient was injected with strophanthin. The patient's condition improved, but soon there were

nausea, vomiting, disturbances in heart rhythm. From the anamnesis it is known that the patient takes Digoxin in a small dose.

1. What was the reason of the above adverse effects?
2. What drugs should be prescribed to the patient for elimination of glycosides?
3. What are the principles of their action?

Case №39

The patient was admitted to the hospital with symptoms of intoxication after taking a large dose of sedative-hypnotic drug.

1. What diuretics should be prescribed to the patient to remove toxic substances from the body as quick as possible?
2. To which groups of diuretics do they belong to, what are the features of their action?

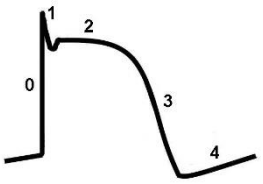
Case №40

A patient suffering from arterial hypertension applied to the physician with complaints of dyspnea attacks that she had after she began to take an antihypertensive drug on her own. From the anamnesis it was revealed that the patient also suffers from bronchial asthma.

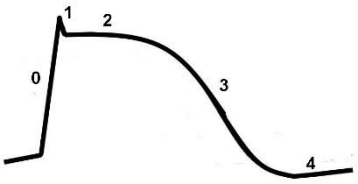
1. What medication could have provoked asthma attacks? What group of drugs does it belong to?
2. What are the mechanisms of antihypertensive action of this group?
3. What antihypertensive drugs should be prescribed to this patient?

Задача №41

Effect of the antiarrythmic drug on the action potential duration in Purkinje fibers



Before Drug administration



After drug administration

1.Which antiarrhythmic drugs can cause the following changes in the Purkinje fiber action potential? Name their pharmacological group and their effects on the parameters of the heart?
2. What are the indications for those drugs?
3. What side effects can they cause?

Case №42

A 32-year-old patient, who suffered from antiphospholipid syndrome (APS) was treated with an antithrombotic drug, but after its use the hematomas appeared during minor injuries. Thus for, vitamin K therapy was prescribed.

1. What treatment was being prescribed to the patient?
2. Which group does this drug belong to?
3. What is its mechanism of action?
4. What other side effects are possible with its use?

Case №43

The patient was given a drug X before the colonoscopy, to avoid anxiety and unpleasant memories of this procedure.

1. Name the group of drugs that drug X belongs to?
2. What specific pharmacological effects of this group of drugs promote their use for premedication?

Case №44

A 68-year-old patient with metastatic cancer was prescribed a transdermal therapeutic system with fentanyl.

1. What is the purpose of prescribing the drug?
2. What group of drugs does it belong to?
3. What pharmacological effects and side effects does it cause?

Case №45

The doctor prescribed L-DOPA and trihexyphenidyl to a patient with Parkinson's disease. After a while, she began to worry about dry mouth, constipation and visual impairment.

1. To which group of antiparkinsonian drugs do prescribed medication belong to?
2. Which drug could cause the described side effects?
3. What is the mechanism of these side effects?

Case №46

Patient N. with a diagnosis of schizophrenia is being treated by a psychiatrist. For several time he received effective antipsychotic therapy. Symptoms of psycho decreased, but signs of extrapyramidal disorders appeared.

1. What kind of antipsychotic medication did the patient receive?
2. What anti-Parkinsonian drug should be prescribed to the patient for the correction of extrapyramidal disorders.
3. Which anti-Parkinsonian drugs cannot be prescribed in this case and why?

Case №47

A 42-year-old patient has been observed for a long time by a psychiatrist for a severe endogenous mental illness. For many years he received maintenance therapy with antipsychotic drugs, he felt satisfactory. His condition changed on the eve of the refusal to take an antipsychotic. In connection with complaints of lack of sleep and the unmotivated alarm that appeared, he was examined by a psychiatrist, to whom the patient said that he was “being watched.” Recommended resumption of antipsychotic medication with a mandatory increase in dose. An antiparkinsonian drug has been prescribed to prevent extrapyramidal symptoms.

1. Which group of antipsychotics is most likely a drug taken by a patient?
2. What antiparkinsonian drug is usually prescribed for the prevention and correction of extrapyramidal disorders in the treatment of antipsychotic drugs?
3. What anti-Parkinsonian drugs and why cannot be used for this purpose?

Case №48

A 41-year-old man with a depressive disorder asked his doctor to replace his antidepressant, which he has been taking for about 2 months. The symptoms of depression were significantly reduced, but the tolerability of the drug was markedly reduced. The patient developed drowsiness during the day, blurred vision, began to experience episodes of a sharp decrease in blood pressure, accompanied by dizziness and fainting.

1. What antidepressant could have been prescribed to the patient?
2. What is the mechanism of its action and what causes the occurrence of side effects when taking the drug?
3. What are the possible options for replacing it?

Case №49

A 35-year-old man with bipolar affective disorder takes a drug prescribed for the purpose of stabilizing his mood. The therapy is effective: the patient feels satisfactory, notes the absence of mood swings. However, he developed symptoms of hypothyroidism (weakness, drowsiness, weight gain, chilliness), which was confirmed in laboratory.

1. What normotymic drug could cause a similar adverse reaction?
2. What are its side effects?
3. Why is it necessary to monitor its concentration in blood plasma during treatment with this normotimic agent?

Case №50

A 43-year-old man injured in a car accident underwent an operation to remove a “foreign body” from the soft tissues of his right shoulder. Regional brachial plexus blockade was performed with a standard dose of lidocaine. After 15 minutes, an additional dose of the drug was administered, due to the insufficient effect of anesthesia.

1. Is it possible in this case, the occurrence of dose-dependent adverse reactions?
2. If yes, which ones?

Case №51

A 43-year-old patient underwent surgical treatment of phlegmon of the right thigh. After the next bandaging, carried out against the background of intravenous administration of an anesthetic, the patient had uncontrolled movements and visual hallucinations.

1. What drug, providing adequate anesthesia and analgesia for incomplete loss of consciousness, could be used in the patient?
2. What can explain the development of these symptoms?
3. Name the classification of general anesthetics

Case №52

A 20-year-old patient has some extensive abrasions, which are planned to be treated with a local anesthetic and antiseptic. In her anmnesis: an allergic reaction to PABA esters (urticaria when applied to the skin containing cream).

1. Which local anesthetic treatment will be preferred in this case?
2. Justify your choice.

Case №53

Patient A., 65 years old, will have hip arthroplasty. In order to prevent infection of the surgical area, antibiotic prophylaxis is planned.

1. Which of the antibiotics is most suitable for the antibiotic prophylaxis purposes in this case?
2. Indicate to which antibiotic group your chosen drug belongs to.
3. What determines its purpose for antibiotic prophylaxis in surgery?

Case №54

Patient S., 30 years old, was given antibiotic therapy for severe pneumonia caused by MRSA. During the course of the disease, positive dynamics in treatment were noted, but after the next infusion of an antibiotic on the skin in the face and neck areas, extensive areas of redness appeared.

1. Which antibiotic could provoke the development of an undesirable reaction?
2. Indicate the type and mechanism of action of this antibiotic.
3. What is the spectrum of antibacterial action of this antibiotic?

Case №55

Patient M. who is suffering from gastric ulcer was prescribed therapy for H. pylori eradication. During the treatment, the patient's condition improved: the epigastric pain has decreased, heartburn stopped. However, in open areas of the body exposed to sunlight, the phenomena of photo dermatosis began to be noted - erythematous polymorphic rashes, itching, swelling and peeling.

1. Which antibiotic could provoke these adverse reactions?
2. What are the other side effects of this drug?

Case №56

A 66-year-old man with a diagnosis of febrile neutropenia was hospitalized in the intensive care unit of the hospital. In his anamnesis: chemotherapy for lung cancer. Pseudomonas aeruginosa (Pseudomonas aeruginosa) was found in blood culture. The combined antibacterial therapy of meropenem and amikacin were prescribed.

1. What antibiotic groups do these drugs belong to?

2. What side effects are possible with use of amikacin?

Case №57

Patient S., 30 years old, receives antibiotic therapy for gastric ulcer treatment, caused by H. pylori. Despite the doctor's warning, he combined drugs to eradicate H. pylori with alcohol. The patient's condition and well-being worsened suddenly, an emergency team was called. The patient complained on feeling of fear, nausea, vomiting, palpitations. Blood pressure measurement showed arterial hypotension.

1. Which antibacterial agent took the patient together with alcohol that provoked that condition?
2. Why this antibacterial drug not compatible with alcohol?
3. What is the spectrum of action of this antibacterial agent?

Case №58

A forty-year-old man with an active form of pulmonary tuberculosis receives therapy with the main anti-TB drugs for five months. Recently, he began to notice tingling sensations in his legs and "goosebumps" on the skin of his lower limbs. Examined by a neurologist, the diagnosis was established: "Peripheral neuropathy."

1. Your assumptions: what vitamin deficiency is the patient possibly experiencing?
2. Name the anti-TB drug that could cause these complications?
3. Indicate the type and mechanism of antituberculosis action and the spectrum of antimicrobial activity of this drug.

Case №59

During the course of chemotherapy for lymphocytic leukemia, the young man had an increase in blood pressure, swelling, tachycardia. And following symptoms have appeared: weakness, irritability, sleep disturbances, epigastric pain.

1. Indicate which of the anticancer drugs could cause these adverse reactions?
2. To which group of anticancer drugs does the drug belong?
3. Indicate the main mechanisms of action of this drug, that caused those symptoms to the patient.

Case №60

In order to increase the effectiveness of therapy, a patient B. with acute leukemia was prescribed a drug that synchronizes the tumor cell population by delaying all dividing cells in phase of mitosis (the so-called "metaphase poison").

1. Name the drug.
2. To which group of anticancer drugs does it belong to?
3. Indicate the side effects that it may cause.