



ОҢТҮСТІК ҚАЗАҚСТАН <b>MEDISINA</b> <b>AKADEMIASY</b> «Оңтүстік Қазақстан медицина академиясы» АҚ		SOUTH KAZAKHSTAN <b>MEDICAL</b> <b>ACADEMY</b> АО «Южно-Казахстанская медицинская академия»
Department "Surgery"		44 / 11 ( )
Lecture complex on the discipline "General Surgery"		1 p. of 40

## LECTURE COMPLEX

Discipline:	"General Surgery"
Discipline code:	GS 3305
Title of the EP:	6B10115 «Medicine»
Volume of study hours/credits :	90 h. (3 credits )
Course and semester of study:	3 course, V semester
Volume of lectures:	6

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The lecture complex of the discipline "General Surgery" was developed in accordance with the working curriculum (syllabus) and discussed at a meeting of the department

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Head of the Department  
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## Lecture № 1

### 1. Topic: Antiseptics.

**2. Goal:** To consolidate and expand students' knowledge of general asepsis issues. To teach how to recognize various types of infections and their ways of spreading. To teach preventive measures aimed at preventing pathogens from entering the body and methods of combating them. To acquaint students with the types and principles of asepsis, manipulations performed, and sterilization methods. To acquaint students with the types of autoclaves and the principles of sterilizers. To teach how to strictly follow the principles of sterilization in accordance with asepsis requirements.


### 3. Lecture abstracts:

There are mechanical, physical, chemical and biological antisepsis.


**Mechanical antisepsis.** The basis of mechanical antisepsis is the removal of non-viable tissues, pus, fibrin from an infected, purulent wound, purulent focus, which are the habitat and nutrition of microbial flora. It is known that healthy tissue is not damaged by the action of purulent microflora and does not contain it. Removal of devitalized tissues, although it is not a direct, but an indirect effect on microflora, contributes to the sterilization of the wound.



Mechanical antisepsis options include primary surgical treatment of infected wounds, the purpose of which is to excise the edges, walls and bottom of the wound within healthy tissues (see Wounds). Along with the excised tissues, hemorrhages, hematomas, blood clots, foreign microbodies, and the microflora contained in them are removed from the wound. The sooner such an operation is performed, the greater the likelihood of achieving wound sterility. If microbial flora begins to develop in the infected wound, which is possible with untimely or incomplete primary surgical treatment, or the wound is purulent from the very beginning (after opening abscesses, phlegmon), secondary surgical treatment of the wound is used. In this case, the edges, walls and bottom of the wound are not excised, but necrotic tissue, pus and fibrin are removed mechanically (scalpel, scissors, vacuuming, washing with a stream of liquid under pressure), purulent pockets and leaks are opened. In this case, the microbial flora is also removed and, although it is not possible to achieve wound sterility, the amount of microflora in it decreases and favorable conditions for wound healing are created. Any wound dressing has elements of mechanical antisepsis (wound toilet). Removal of bandages soaked in blood and pus, tampons, washing the wound with a stream of liquid, removal of loose necrotic tissue, sequesters, drying the wound with balls and tampons help remove microbial flora from it, the amount of which decreases by 10-20 times.


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**Physical antisepsis.** Methods of physical antisepsis are based on the laws of capillarity, hygroscopicity, diffusion, osmosis, the siphon principle, laser and ultrasound exposure. Drainage of wounds and purulent foci (abscesses, empyemas) involves creating conditions for the outflow of wound discharge into the external environment (into a dressing or a special container with antiseptic solutions). A gauze tampon is used as drainage in wound treatment. Tampons of various sizes are prepared from a strip of gauze and loosely inserted into the wound; due to its hygroscopicity, the tampon absorbs blood, exudate and pus. Its drainage properties are manifested for up to 8 hours, after which it can turn into a "plug" that clogs the wound and disrupts the outflow of exudate from it. To improve the drainage properties of the dressing, the tampons are moistened with a hypertonic (5-10%) solution of sodium chloride. This helps to create high osmotic pressure, which leads to increased fluid outflow from the wound into the dressing. In addition to a regular tampon, a Mikulich tampon is used. A large gauze napkin with a thread sewn to its middle is inserted into the wound. The napkin is placed on the bottom and walls of the wound, forming a "bag" that is filled with gauze tampons. When the tampons are soaked with wound discharge, they are removed, leaving a gauze napkin, and the resulting cavity is filled with new tampons. The tampons are changed several times - until the outflow of purulent discharge stops, after which the napkin is removed by pulling on the thread. Drainage can be done using rubber, chlorvinyl and other tubes of different diameters, which are inserted into the wound, abscess cavity, joint (in purulent arthritis), pleura (in purulent pleurisy), into the abdominal cavity (in purulent peritonitis). The resulting pus, tissue decay products, and with them microorganisms are released into the bandage through one or more drains. The drain can be connected by a tube to a vessel into which some antiseptic solution is poured; then the wound discharge will be released into the vessel, thereby reducing contamination of the bandage. Chemical antiseptics, antibiotics, proteolytic enzymes are introduced into the wound or purulent cavity through the drain. For more effective washing of wounds and purulent cavities, another tube is inserted into them (in addition to the drainage for the outflow of wound discharge) and an antibacterial solution is introduced through it, along with which the decay products of tissues, pus, blood and fibrin are removed from the wound through the drainage (Fig. 8). Thus, by combining the methods of physical and chemical antisepsis, conditions are created for flow-washing drainage. This method is also used in the treatment of purulent pleurisy and peritonitis. To increase the effectiveness of the method, proteolytic enzymes are used as a washing solution, which promote faster melting of non-viable tissues, pus, fibrin (the method of flow-through enzymatic dialysis). If the drained cavity is hermetic (a wound sutured with sutures, pleural empyema, purulent arthritis, an abscess cavity), active aspiration (vacuum drainage) is used. The vacuum in the system can be created using a Janet syringe, which removes air from a sealed jar with drainage connected to it, or using a water-jet suction or a three-jar system. This is the most effective drainage method, it also helps to reduce the cavity of the wound, close it more quickly and eliminate inflammation, and in case of pleural empyema - straighten the lung compressed by exudate. Aseptic conditions in the wound can be created by placing the limb with the wound or the patient himself (in case of extensive burns) in a special chamber in which an abacterial environment is created using the installation. Laser radiation in the form of a low-power beam has a bactericidal effect and does not have a damaging effect on tissue. Mainly a carbon dioxide laser is used, the focused beam of which has an evaporating effect on necrotic tissue and microorganisms. A very thin coagulation film is formed on the walls and bottom of the wound, preventing the penetration of microorganisms and their toxins into the tissue. Laser radiation is used to treat wounds. Low-frequency ultrasound has a bactericidal effect. In a liquid medium (a wound, a closed cavity), ultrasound exhibits physical and

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chemical properties. In a medium exposed to ultrasound, a cavitation effect is created - shock waves arise in the form of short pulses with the formation of cavitation bubbles. At the same time, under the influence of ultrasound, water ionization occurs with the formation of  $H^+$  and  $OH^-$ , under the influence of which oxidation-reduction processes in the microbial cell cease. Ultrasound cavitation is used to treat wounds.

**Chemical antiseptics.** Chemical antibacterial drugs are used to combat infection in a wound, inflammation sites; they are used for therapeutic or prophylactic purposes to obtain an antibacterial effect directly in the human body. Nitrofurans derivatives. The drugs are effective against pyogenic coccal flora. Furacilin (furacilinum) is used in aqueous solutions of 1:5000 for washing purulent wounds during dressing, abscess and empyema cavities - through drains (for example, in purulent pleurisy, purulent fistula in osteomyelitis), etc. Soluble furagin, or solafur, is used as a 0.1% solution for the same purposes as furacilin. The drug can also be used intravenously in a dose of 300 ml. In addition to these drugs, furazolidone in 50 mg tablets and others are also used. Nitrofurans drugs are part of the film-forming drug lifusol, which is produced in the form of an aerosol and is used to treat superficial wounds and burns. It forms a protective film with an antimicrobial effect on the wound surface. The film lasts for 5-7 days. A group of acids. A 2-3% aqueous solution of boric acid is used to wash wounds, purulent cavities or purulent fistulas. Salicylic acid has an antibacterial and keratolytic effect. It is used in the form of powders, ointments, 1% and 2% alcohol solutions. Oxidizers. This group includes hydrogen peroxide and potassium permanganate, which, when combined with organic substances, release atomic oxygen, which has an antimicrobial effect. Hydrogen peroxide solution is used as a 3% aqueous solution during dressings, for washing purulent wounds, purulent fistulas, empyemas, abscesses. The abundant foam formed during washing helps remove pus, fibrin, and necrotic tissue from the wound. It has deodorizing properties. Hydroperite is a complex preparation of hydrogen peroxide and urea. It is available in 1.5 g tablets. A 1% solution is used to wash wounds (2 tablets are dissolved in 100 ml of water). Potassium permanganate is used to treat purulent wounds (0.1-0.5% solution), burns (2-5% solution), and to wash cavities (0.02-0.1% solution). Dyes. Brilliant green is used as a 1-2% alcohol or aqueous solution to lubricate superficial wounds, abrasions, and to treat pustular skin diseases. Methylene blue is used to lubricate superficial wounds and abrasions (3% alcohol solution), treat burns (1-2% alcohol solution), and wash purulent cavities (0.02% aqueous solution). Detergent. Chlorhexidine is a 20% aqueous solution of chlorhexidine bigluconate. A 1:400 solution is prepared for washing wounds; a 1:1000 solution is prepared for washing body cavities in case of purulent inflammation; 1 ml of a 20% chlorhexidine bigluconate solution is diluted in 400 and 1000 ml of distilled water, respectively. The solutions are sterilized in an autoclave at 115 °C for 30 minutes. Quinoxaline derivatives. Quinoxidine has a broad spectrum of antibacterial action: it is effective against *Escherichia coli* and *Pseudomonas aeruginosa*, *Proteus vulgaris*, and gas gangrene pathogens. It is taken orally at 0.25 g 3 times a day. Methods of using chemical antiseptics. Local application of chemotherapeutic agents: a) use of dressings with antiseptic preparations in the treatment of wounds and burns; preparations can be used in the form of solutions (they are used to wash the wound during dressing, to moisten tampons), ointments, and powders; b) introduction of solutions of antibacterial preparations into the wound, closed cavities, followed by aspiration through drains — washing, flow drainage (a combination of physical and chemical antisepsis). An example of the combined use of physical and chemical antisepsis are peritoneal dialysis for purulent peritonitis, flow drainage of the pleural cavity for purulent pleurisy; c) infiltration of the inflammation site with a solution of antibacterial drugs to combat the infection in it (antibiotics are more often used for these purposes). General use of


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chemotherapeutic agents includes: a) taking antibacterial drugs orally (in the form of tablets) for the purpose of local action on the microflora of the gastrointestinal tract when preparing patients for bowel surgery and a general effect on the body after the drug is absorbed into the blood; b) intravenous administration of certain chemotherapeutic drugs.


**Biological antiseptics.** Biological antiseptics involves the use of biological agents to combat infection in the human body. The range of drugs is extremely wide, the ways of their application and direction of action are different. Conventionally, they can be divided into drugs for local and general antibacterial action. The group of biological antiseptics includes drugs that can activate the protective antimicrobial factors of the body (immunity). These can be both drugs with a specific direct antimicrobial action (administration of ready-made specific antibodies - passive immunization agents) and drugs that stimulate the action of antibodies. Immune defense agents also stimulate non-specific immune reactions - the production of cellular immunity factors in the body. Antibiotics occupy an important place among antibacterial drugs. Their use in modern conditions presents significant difficulties, which is due to the change in the species composition and properties of the microbial flora - the spread of drug-resistant microorganisms. The main causative agents of purulent-inflammatory diseases (staphylococci and gram-negative bacteria - Escherichia coli, Proteus, Pseudomonas aeruginosa, etc.) have acquired a high degree of antibiotic resistance and even antibiotic dependence due to the mutagenic effect of antibiotics. Among the causative agents of purulent-inflammatory diseases, a certain place is occupied by opportunistic microorganisms - non-spore-forming (non-clostridial) anaerobes and mainly bacteroids, which are distinguished by their natural resistance to most antibiotics. The main antibiotics, the use of which is indicated for the treatment and prevention of inflammatory diseases, are the following.

**Penicillins.** One of the most active is benzitenicillin (a natural antibiotic). Semi-synthetic penicillins are divided into two groups: 1) penicillinase-resistant (sodium oxacillin, sodium methicillin, sodium dicloxacillin), active against gram-positive microbial flora. They are used for staphylococcal infections of various localizations: pneumonia, abscess, pleural empyema, osteomyelitis, abscess and phlegmon of soft tissues, wounds; 2) broad-spectrum semi-synthetic penicillins: ampicillin, ampiox (a combination drug consisting of a mixture of sodium salts of ampicillin and oxacillin), carbenicillin disodium salt. These drugs are effective in the treatment of burns, wound infections, and IA

**Cephalosporins.** This group includes cephaloridine (ceporin), cefazolin (kefzol), cephalolitin, cephalixin - cephalosporins of the 1st and 2nd generations; drugs of the 3rd generation - cefotaxime, ceftazidime, ceftriaxone; IV generation - cefpirone (quiten). Aminoglycosides. These include gentamicin sulfate, canamicin, sisomicin sulfate, tobramycin; amikacin (a semi-synthetic aminoglycoside). The drugs have an oto- and nephrotoxic effect. Macrolides (erythromycin, oleandomycin, azithromycin). Tetracyclines. This group includes tetracycline, okeitetracycline dihydrate and hydrochloride, semisynthetic tetracyclines - metapicline hydrochloride (rondomycin), doxycycline hydrochloride (vibramycin). Fluoroquinolones (ofloxacin, ciprofloxacin, levofloxacin). Carbapenems: imipenem, pleropenem, tienam (a combination drug: imipenem + sodium celastatin). Lincosamines (lincomycin, clindomycin). Glycopeptides (vancomycin). Broad-spectrum antibiotics that affect both gram-negative and gram-positive flora include semi-synthetic penicillins, cephalosporins and aminoglycosides, and fluoroquinolones. Proteolytic enzymes are biological antiseptics. They have the ability to lyse (melt) necrotic tissue, fibrin, and pus, have an anti-edematous effect, and enhance the therapeutic effect of antibiotics. There are enzyme preparations of animal origin - trypsin, chymotrypsin, chymopsin, ribonuclease, collagenase; of bacterial origin - terrilytin, streptolyase (streptokinase), asperase, iruxol (ointment

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for enzymatic cleansing of wounds; contains clostradyl peptidase - an enzyme with proteolytic action); of plant origin - papain, bromelain. Enzyme preparations with proteolytic action are used locally in the treatment of purulent wounds, trophic ulcers in the form of a solution or powder. Napkins soaked in an enzyme solution are applied to a wound or ulcer treated with a solution of hydrogen peroxide or furacilin; in case of abundant wound discharge, the wound is sprinkled with powder. Some enzymes are used in ointments (iruxol, asperase). The preparations are used until the wounds or ulcers are completely cleared of necrotic tissue and pus. The doses of the preparations are indicated in the instructions for their use. Enzyme solutions are used for intracavitary administration: into the pleural cavity (in purulent pleurisy), into the joint cavity (in purulent arthritis), into the abscess cavity. The preparations are administered by puncturing the cavities or through drainage tubes after preliminary removal of pus by aspiration. In the case of a lung abscess, if it is not drained through the bronchi, the abscess is punctured through the chest wall with the introduction of an enzyme solution into its cavity. Enzymes can be delivered into the lung abscess cavity through a catheter or bronchoscope. In osteomyelitis, enzymes are administered into the bone marrow canal or bone cavity by puncturing the bone with a needle or through drains installed during surgery. Purulent fistulas are washed with an enzyme solution. In case of purulent lung diseases, inhalations of proteolytic enzymes are performed using inhalers. In the treatment of inflammatory infiltrates, enzyme electrophoresis is used. Trypsin or chymotrypsin is used for these purposes. As anti-inflammatory agents, proteolytic enzymes (trypsin, chymotrypsin) are injected intramuscularly at a dose of 0.07 mg/kg. Proteolytic enzymes together with a solution of novocaine can be used for tissue infiltration in the initial forms of inflammation or be part of solutions for novocaine blockades. Thus, in the initial forms of mastitis, a retromammary blockade is performed (see Local anesthesia), 70-80 ml of a 0.25% solution of novocaine, 10 mg of chymotrypsin or trypsin and 500,000 U of kanamycin are injected into the retromammary space. Bacteriophages. To combat microorganisms in the human body, a bacterial virus is used - a bacteriophage that can reproduce in a bacterial cell and cause its lysis. Bacteriophages have a specific effect. Antistaphylococcal, antistreptococcal bacteriophages, and anticoli bacteriophages are used. A polyvalent bacteriophage contains several phages and is used if the causative agent of the disease is unknown; after examination and detection of the causative agent, a specific bacteriophage is prescribed. Bacteriophages are used to irrigate purulent wounds, infiltrate tissues surrounding the wound, and introduce them into purulent cavities through drains and microirrigators. In case of purulent lung diseases, the bacteriophage is introduced endotracheally or directly into the abscess cavity by puncture through the chest wall. In case of sepsis, a specific bacteriophage is injected intravenously. Immune agents. Anatoxins are used for active immunization. Staphylococcal toxoid is administered subcutaneously at 0.1 ml in the scapular region, then every 2-3 days the injection is repeated, increasing the dose by 0.1 ml, gradually bringing it to 1 ml. In emergency cases, 0.5 ml of staphylococcal toxoid is administered before surgery. Tetanus toxoid is used for routine and emergency tetanus prevention. Injection of the drug in an emergency. One ampoule of serum contains 1500-3000 IU, the prophylactic dose of serum is 3000 IU. A single administration of the prophylactic dose of serum protects against tetanus for up to 5 days. The therapeutic dose of serum exceeds the prophylactic dose by 10 times. In all cases, the serum is administered with precautions due to the risk of anaphylactic reaction. Antigangrenous serum is an immune serum of animals (horses) containing antibodies to 4 main causative agents of gas (anaerobic) gangrene - Clostridium perfringens, Cl. Oedematiens, Cl. septicum, Cl. histolitikum. It is used for prophylactic and therapeutic purposes. For prophylactic purposes, the serum is administered intramuscularly, for therapeutic purposes - intravenously with

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precautions (due to the risk of allergic reactions). Immunostimulating drugs that enhance the body's nonspecific immunological defense include prodigiosan, lysozyme, and levamisole (Decaris). Prodigiosan is a bacterial polysaccharide that stimulates leukopoiesis, activates the T-immune system, and stimulates phagocytosis. It is indicated for use in cases of decreased phagocytosis activity and suppressed leukopoiesis, which results in a decrease in the number of lymphocytes and monocytes, and according to immunogram data, in a decrease in the number of B-lymphocytes circulating in the blood. The drug is prescribed at 50 mcg 4 times a day at intervals of 3-4 days. Levamisole (Decaris) stimulates the formation of T-lymphocytes, phagocytes, and increases antibody synthesis. The drug (6 times a day, every other day) is prescribed for a decrease in the number of T-lymphocytes in the blood, inhibition of phagocytosis. The course dose is 150 mg. Lysozyme is a natural humoral factor of non-specific reactivity, it has a bactericidal effect. The drug increases the non-specific defense of the body, enhances the effect of antibiotics. Thymalin (thymarin) is a drug obtained from the thymus gland of cattle, it stimulates immunological processes - the reaction of cellular immunity, regulates the number of T and B lymphocytes, enhances phagocytosis. In acute and chronic purulent processes accompanied by a decrease in cellular immunity, 10-30 mg is prescribed intramuscularly daily for 5-20 days, to prevent postoperative purulent-inflammatory complications, 10-20 mg is administered before surgery for 5-7 days. The drug is diluted with isotonic sodium chloride solution immediately before injection. Taktivin is obtained from the thymus gland of cattle. It is used in immunodeficiency states with predominant damage to the T-system of immunity, in purulent-inflammatory diseases, sepsis. Normalizes the T-system of immunity, restores the activity of T-killers. Prescribed in a dose of 1-2 mcg / kg at night for 5-14 days. For prophylactic purposes, it is administered for 2 days before surgery and 3 days immediately after it. Available in vials of 1 ml of 0.01% solution.

#### 4. Illustrative material:

(Overview - illustrative, booklets included)




#### 5. Literature:

- Durmanov, K. D. General surgery: okulyk / . - Karaganda: AKNYR, 2017. – 608p. S
- Gostishchev V.K. General surgery: textbook and CD. – 4th ed. – M., 2016. – 832 p.;

#### Control questions (feedback)

1. What does the term "Antisepsis" mean?
2. Who is the founder of asepsis and antisepsis?
3. What types of antisepsis do you know?



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4. List the classification of antiseptic drugs.
5. What are the methods of using antiseptic drugs.
6. Explain the rules for using types of antiseptics?

## Lecture № 2

### 1. Topic: Bleeding and hemostasis. Acute blood loss.

**2. Goal:** To consolidate and expand students' knowledge of bleeding and hemostasis. To teach how to determine indications and contraindications for various types of bleeding and hemostasis. To teach how to recognize the degree of bleeding and provide timely assistance to the patient with various complications.

### 3. Lecture abstracts:

Bleeding is the outpouring of blood from the bloodstream into the external environment or internal organs. Normally, a person has about 4-5 liters of blood, of which 60% circulates through the vessels, and 40% is in the blood depot (liver, spleen, etc.). A loss of 1/3 of blood is life-threatening, but patients can die with a smaller loss of blood if it flows out quickly. Men tolerate blood loss worse, while women are more adapted to blood loss.

**A distinction is made between internal and external bleeding.** Depending on the type of damaged blood vessels, bleeding may be

- arterial,
- venous,
- capillary,
- parenchymatous,
- mixed

Arterial bleeding is characterized by the release of blood from the wound in a pulsating stream. With venous bleeding, the blood is darker and is abundantly released from the wound in a continuous stream without a tendency to stop on its own. A cut vein can be seen in the wound. Capillary bleeding is observed with skin and muscle wounds. Blood is released less intensely than with a wound to a large vein, has a tendency to stop on its own, the amount of blood flowing depends on the size of the wound.

Due to:


1. Post-traumatic - as a result of trauma or wounds, including surgical ones;
2. Erosive - due to the erosion of the vessel wall by a pathological process: gastric ulcer, disintegrating tumor, purulent melting of tissues and vessel walls;
3. Diapedetic - bleeding without damaging the integrity of the vessel walls - in blood diseases (hemophilia), vitamin deficiency (scurvy), etc.

By the nature of communication with the external environment: there are external, internal and hidden bleeding.

1. External - blood flows directly into the external environment, so it is easy to diagnose.
2. Internal - the flowing blood has no communication with the external environment. Types: bleeding in the cavity of the body and in tissues.

In the cavity of the body:

- a) into the abdominal cavity - hemoperitoneum, most often with damage to the parenchymal organs;

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- b) into the pleural cavity - hemothorax, more often with rib fractures or stab wounds;
- c) into the cavity of the joints - hemarthrosis;
- d) into the cavity of the pericardium - hemopericardium, the accumulation of a significant amount of blood in the pericardial cavity causes compression of the heart - cardiac tamponade.

In the tissues of the body:

- a) hemorrhage – diffuse impregnation of tissues with blood;
- b) hematoma – accumulation of blood in tissues with the formation of a cavity;

What are the clinical manifestations of acute blood loss?

A victim with acute blood loss is pale, covered in cold sweat, usually lethargic, indifferent to the surroundings, speaks in a quiet voice, complains of dizziness and flashing "flies" or darkening before the eyes when raising the head, asks for a drink, notes dry mouth. The pulse is rapid, small in volume, blood pressure is low, and with a rapid outpouring of a large amount of blood, a picture of hemorrhagic shock with persistent hypotension develops.

Arterial bleeding

What are the basic principles of stopping external arterial bleeding?

The main emergency measure, often saving the life of the victim, is the temporary stopping of external bleeding.

Arterial bleeding from the vessels of the upper and lower extremities, as well as from the stumps of the extremities during traumatic amputations, is stopped in two stages: first, the artery above the site of injury is pressed against the bony protrusion to stop the blood flow to the site of injury, and then a standard or improvised tourniquet is applied.

A note indicating the time of application of the tourniquet is placed under the tourniquet. The time of application of the tourniquet must be indicated in the accompanying sheet. Stopping external bleeding is the primary task of first aid. Arterial bleeding is especially dangerous. Arteries are blood vessels that carry blood from the heart to the organs.

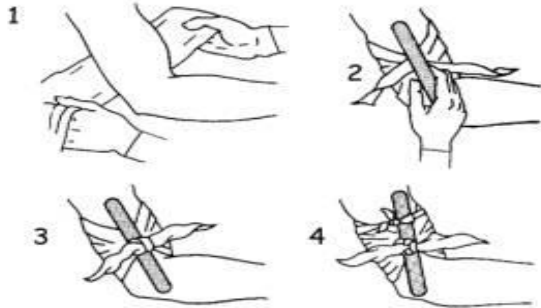
The most dangerous are injuries to large arteries - femoral, brachial, carotid; in these cases, death can occur in a matter of minutes.

For example, bleeding from the femoral artery can lead to the death of the victim within 1 - 2 minutes. Therefore, it is necessary to know and be able to apply the methods of finger pressure on arteries and the technique of applying an arterial tourniquet.

The figure shows a diagram of pressing the main arteries to temporarily stop bleeding. Pressing the artery with a finger or palm is done before applying an arterial tourniquet. It is very important that the tourniquet is applied only to the shoulder or thigh

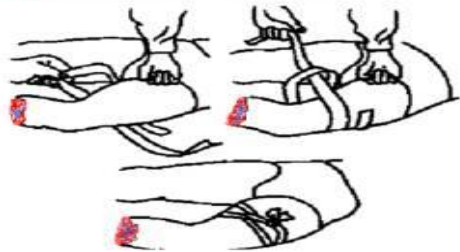
Signs of arterial bleeding: Blood splashes out of the wound in a pulsating stream. The color of the blood is bright scarlet. The pulsation of the blood coincides with the pulse rate. The rules for pressing the artery during bleeding are as follows: Press the artery above the wound (closer to the heart) Press the artery with enough force to stop the bleeding. Do not weaken the pressure before applying the tourniquet For superficial arteries, it is enough to press it with a finger, for large arteries (femoral), use a palm or fist. Applying a tourniquet when injuring large arteries: Wrap the limb with a towel (gauze) up to the bleeding site (central). Raise the injured limb. Stretch the tourniquet slightly and make 2-3 turns around the limb. Secure the ends of the tourniquet with a hook and chain. Tie the ends of the homemade tourniquet (thick rope, fabric, belt). Leave a note indicating the time of application of the tourniquet. The tourniquet can be on the limb for no more than 2 hours! Apply a sterile bandage to the wound.

Артериальное кровотечение.



1. For example, the figure shows the application of a tourniquet from auxiliary material.
2. 1. wrap the overlying part of the limb with a layer of gauze. 2. Using a thick cloth (kerchief) and a stick, apply an improvised twist. 3.

Артериальное кровотечение.

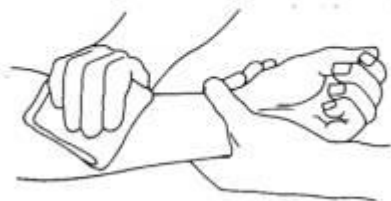


Twirling the stick

You can use a standard rubber tourniquet. The technique for applying it is not complicated. For example, when amputating a lower limb, without stopping squeezing the femoral vein with a fist, we pass a rubber tourniquet under the thigh, make a loop, tighten it until the bleeding stops and tie a knot. If the tourniquet is applied correctly, bleeding from the wound stops, the pulse in the radial artery or dorsal artery of the foot disappears, the distal parts of the limb turn pale. A note indicating the time of application of the tourniquet is placed under the tourniquet.

Артериальное кровотечение.

Давящая повязка для остановки кровотечения



Bleeding from small arteries on the forearm, hand, and foot can be stopped by squeezing the vessels in the wound without applying a tourniquet. Place a clean napkin on the wound, press it firmly, and hold for 4-5 minutes. Then apply a pressure bandage. A tourniquet is used only for extensive multiple wounds and crushing of the hand or foot. Wounds of the digital arteries are stopped with a tight pressure bandage. How is external arterial bleeding in the scalp, head, neck, and torso stopped?

Arterial bleeding in the scalp (temporal artery), neck (carotid artery), and torso (subclavian and iliac arteries) is stopped by tight tamponade of the wound. Using tweezers or a clamp, the wound is tightly tamponed with napkins, on top of which you can put an unfolded bandage from a sterile package and bandage it as tightly as possible. If the artery is visible in the wound, then hemostatic clamps can be applied.

**Venous bleeding**

**Signs of venous bleeding.** If the blood is dark red and comes from the wound in a slow or weakly pulsating stream in time with breathing, your patient has venous bleeding. Bleeding from large veins (femoral, subclavian, jugular) is life-threatening for the patient both due to rapid blood loss and the possibility of air embolism. In addition to cases of traumatic damage to veins, venous bleeding is possible with rupture of blood vessels in the mucous membrane of the nose or varicose veins of the lower extremities. Nosebleeds caused by taking aspirin, high blood pressure, may not stop for a long time and require hospitalization of the patient. First aid for any venous bleeding involves applying a pressure bandage, cold and an elevated position.


**Help with venous bleeding.** Applying a pressure bandage and applying cold. A pressure bandage is applied below the wound, since venous blood rises from the peripheral vessels to the heart. Such a pressure bandage consists of several sterile gauze pads or unwound bandage, onto which a tourniquet or elastic bandage is applied. The correct application of a venous tourniquet is indicated by stopping the bleeding, but maintaining the pulsation below the place of pressure. It is good to apply an ice pack or a heating pad filled with cold water on top of the bandage in the projection to the source of bleeding. Do not forget that after 30-40 minutes, the cold must be removed for 10 minutes to restore the general blood flow in this area.

If the bleeding occurs from a limb, it should be given an elevated position. In case of nosebleeds, the wing of the nose is pressed against its septum, it is good to first insert a wad of cotton wool soaked in 3% hydrogen peroxide into the nasal passage. Apply cold to the bridge of the nose or the back of the head for 3-4 minutes with breaks of 3-4 minutes until the bleeding stops. Do not tilt your head back, because the blood will flow down the back of the throat.

Signs of capillary bleeding. Slow blood flow from the entire surface of the wound is an indicator of capillary bleeding. Despite the apparent harmlessness of such a wound, stopping such bleeding is very difficult if the patient suffers from poor blood clotting (hemophilia).



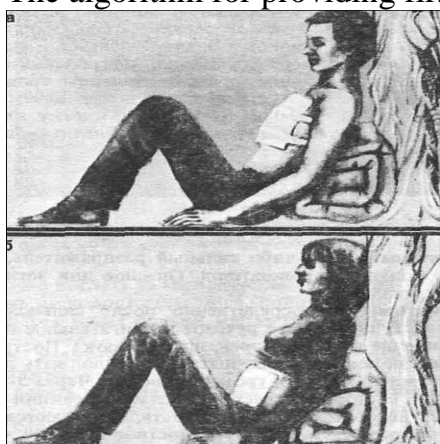
**Help with capillary bleeding.** Applying a pressure bandage. If you have a hemostatic sponge in your first aid kit, apply it to the wound, then apply a pressure bandage. If you don't have such a sponge, apply several layers of gauze napkins to the wound, which are fixed with a pressure bandage. In any case, if the wound is on a limb, it should be elevated and provided with rest and

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cold (ice pack). Parenchymatous bleeding (internal), internal bleeding is a reason for emergency hospitalization. If you suspect internal bleeding, you must call an ambulance as soon as possible and provide first aid before it arrives. Possible internal bleeding can be determined by the following signs

- pale skin
- fatigue, drowsiness, weakness
- cough with blood clots or scarlet foamy sputum in case of pulmonary hemorrhage
- vomiting "coffee grounds" or dark tarry stool in case of gastric bleeding
- cold sweat
- decreased blood pressure and increased heart rate

The algorithm for providing first aid should be approximately as follows



- the patient should remain completely at rest.
- provide maximum access to fresh air if possible
- if the location of the bleeding can be assumed by localizing the pain or other symptoms, then it is necessary to apply an ice pack to the affected area. At home, ice, frozen meat and other frozen foods placed in a plastic bag and wrapped in a towel are suitable.
- if possible, administer hemostatic drugs (calcium chloride, vikasol, epsilon-aminocaproic acid, hemophobin)


Pulmonary hemorrhage can be caused by trauma or disease of the lungs (tuberculosis, abscess, tumor lesion, etc.) and heart (mitral valve disease). It is characterized by coughing up foamy blood, blood-stained sputum, labored intermittent breathing, and shortness of breath. With severe bleeding, blood is coughed up in clots, there are signs of acute blood loss: pronounced pallor, dizziness, decreased blood pressure. The victim is given a semi-sitting position, a bolster is placed under the back for support, the chest is freed (the collar and trouser belt are unbuttoned, a cold compress is applied to the chest, fresh air is provided). The patient is prohibited from speaking, moving, or coughing. Urgently arrange for transfer to a medical facility.

Intrathoracic bleeding is a consequence of chest trauma and damage to internal organs: the heart, large vessels, and lungs. Bleeding into the pleural cavity can be massive, and, as a rule, does not stop spontaneously. The increasing accumulation of blood in the pleural cavity limits the expansion of the lung, which contributes to the development of respiratory failure. Lung ruptures are accompanied by symptoms of pulmonary hemorrhage; the entry of large amounts of blood into the respiratory tract leads to asphyxia, manifested by increased breathing, cyanotic color of the skin and mucous membranes. The rapidity of the increase in threatening symptoms requires rapid transportation of the victim to a medical facility for surgical care. The patient is given a semi-

sitting position with bent lower limbs, an ice pack is applied to the chest, the collar of the shirt and trouser belt are unbuttoned, restraining respiratory movements, providing a free flow of fresh air. Peptic ulcer, stomach cancer, other diseases or injuries are complicated by bleeding into the lumen of the gastrointestinal tract. Symptoms of such bleeding are vomiting the color of coffee grounds, tarry stool, general signs of acute anemia: pallor, tachycardia, decreased blood pressure, weakness, loss of consciousness. The patient is provided with complete rest and a horizontal position. An ice pack is placed on the epigastric region, small pieces of ice can be given to swallow. Transportation to the hospital is carried out on a stretcher in a lying position. Intra-abdominal bleeding occurs as a result of abdominal trauma with damage to internal organs - this is the most common cause of intra-abdominal bleeding. In women, intra-abdominal bleeding often accompanies a ruptured tubal pregnancy. Intra-abdominal bleeding is characterized by large blood loss (up to 2-3 liters), the impossibility of spontaneous stopping, the threat of peritonitis. It proceeds severely, with symptoms of acute anemia, collapse. The only way to save the victim is an immediate operation aimed at finally stopping the bleeding. The patient is prohibited from drinking and eating, transported in a lying position with a cold compress or an ice pack on the stomach and accompanied by a person providing assistance. During the delivery of the victim with bleeding to a medical facility, the accompanying person monitors the patient's condition, consciousness, appearance, periodically records the pulse, if possible - blood pressure. The life of the victim ultimately depends on the timeliness and correctness of first aid for any type of bleeding. The outcome of bleeding is largely determined by the treatment measures carried out at the hospital stage, which are aimed at normalizing the pathophysiological abnormalities caused by blood loss.

#### 4. Illustrative material:



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## 5. Literature:

- • Durmanov, K. D. General surgery: okulyk / . - Karaganda: AKNYR, 2017. - 608 p. S
- • Gostishchev V.K. General surgery: textbook and CD. – 4th ed. – M., 2016. – 832 p;

### 1. 6. Test questions (feedback)

2. 1. The concept of bleeding
3. 2. What is a hematoma and hemorrhage
4. 3. Classification of bleeding
5. 4. General symptoms of bleeding
6. 5. Local symptoms of bleeding
7. 6. Hemothorax; concept, clinical picture, treatment
8. 7. Hemoperitoneum: concept, clinical picture, treatment
9. 8. Hemopericardium: Hemocranium: concept, clinical picture, treatment
10. 9. Dangers and outcomes of bleeding. Temporary stopping of bleeding
11. 10. Applying a pressure bandage. Finger pressure. Applying a tourniquet
12. 11. Final stopping of bleeding. Mechanical, thermal, biological, chemical methods of stopping bleeding.
13. 12. Acute and chronic anemia
14. 13. Compensatory reactions of the body during bleeding
15. 14. Normal indicators of a general blood test

## Lecture No. 3

### 1. The theme: General issues of anesthesiology.

2. Purpose: To consolidate and expand students' knowledge on general issues of anesthesiology. To teach how to identify indications and contraindications to various types of anesthesia, individually select the type of anesthesia and anesthetic drug. To carry out premedication correctly. To teach to recognize the degree of anesthesia and provide timely intensive care to the patient with various complications.

### 3. Lecture abstracts:

General issues of anesthesiology.

Anesthesiology is the science of anesthesia and methods of protecting the patient's body from the extreme effects of surgical trauma.. October 16, 1846 is considered the official date of birth of modern anesthesiology – the American William Thomas Morton used ether anesthesia when removing a tumor of the submandibular region. In 1844, Wales used nitrous oxide. In 1844, the hip was amputated using Chistovich sulfuric ether. In 1847– J. Jung Simpson applied chloroform anesthesia, which is currently not used, due to the high toxicity of the drug. In Russia, anesthesia was used by Inozemtsev on February 7, 1847. For the first time, intravenous anesthesia was applied – hedonal, which was synthesized. Since 1942, curare-like substances have been synthesized, and endotracheal anesthesia with ventilation has appeared.


### Local anesthesia.

Anesthesiology is the science of anesthesia and methods of protecting the patient's body from the extreme effects of surgical trauma. Local anesthesia is the anesthesia of certain areas of the body against the background of preserved consciousness. About 50% of operations are performed under local anesthesia.

### Indications:

It does not require special long-term preoperative preparation. With contraindications to general anesthesia. The patient does not need constant postoperative supervision. Outpatient operations. Elderly and senile persons, emaciated, suffering from respiratory and cardiovascular insufficiency.

### Contraindications:

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Intolerance to the anesthetic due to hypersensitivity. the age is less than 10 years old. The presence of mental disorders in the patient, increased nervous excitability. The presence of inflammatory or scarring changes in the tissues. Ongoing internal bleeding.

#### **Methods of local anesthesia:**

**Infiltration anesthesia according to Vishnevsky.** The method is based on the structural features of fascial formations. Tight novocaine infiltrates move through the cases and merge with each other, hydraulic tissue preparation is carried out. 0.25% ratsvor of novocaine with the addition of adrenaline is used (3 drops of ratsvor per 100 ml of novocaine solution). Regional anesthesia – conduction, intravascular, intraosseous, spinal, epidural, etc.

**Conduction anesthesia**, there are the following types: anesthesia of nerve trunks, anesthesia of nerve plexuses, anesthesia of nerve nodes, spinal and epidural anesthesia. The anesthetic is administered peri - or endoneurally.

**Finger conduction anesthesia according to Oberst – Lukashevich.** A rubber tourniquet is applied to the base of the finger, distally, on the back surface of the main phalanx, the skin and subcutaneous tissue are anesthetized, the needle is pushed to the bone and 2-3 ml of 1-2% novocaine solution are injected, the other side is anesthetized in the same way.

**Intercostal anesthesia** – for rib fractures. Retreating a few cm from the fracture to the spine. The needle is inserted perpendicular to the broken rib, all the way, then, pulling the needle by 2-3 mm, it is pushed to the lower edge of the rib, sliding along its surface and 3-5 ml of 1-2% novocaine solution is injected.

**Novocaine blockades.** Circular blockage of the shoulder. On the anterior surface of the middle third of the shoulder, with the elbow bent, the skin, fascia of the shoulder, and biceps of the shoulder are pierced with a needle. They reach the humerus by pulling back the needle, 50-60 ml of 0.25% novocaine solution is injected, 50-60 ml of 0.25% novocaine solution is injected into the fir of the straightened limb.

Circular blockage of the forearm. In the middle third of the forearm, in the same way. 60-80 ml of 0.25% novocaine solution is administered.

Circular blockade of the hip. Insertion of a needle in the middle third of the thigh along the front surface. They pass to the bone, and slightly pulling back, 150 – 180 ml of 0.25% novocaine solution is injected.

**Retromammary blockade.** During breast surgery. At 3-4 points at the lower and upper poles from the outer surface of the breast. 50 ml of 0.25% novocaine solution is injected through each needle injection.


**Cervical vagosympathetic blockade.** For the prevention of pleuropulmonary shock, in case of chest injury. The patient lies on his back with a roller under his neck, the head is turned in the opposite direction, the arm on the side of the blockade is strongly pulled down. At the posterior edge of the sternocleidomastoid muscle at a level above the intersection with the external jugular vein. The sternocleidomastoid muscle is pushed forward and inside, the skin is pierced with a needle, the needle is pushed up and inside, focusing on the anterior surface of the spine. 40-50 ml of 0.25% novocaine solution is injected. A sign of properly performed anesthesia is the appearance of a Gorner's symptom (pupil dilation) on the side of the blockade.

**Paranephral blockade.** The patient lies on his healthy side with a cushion under his lower back. The leg is located on top, stretched out, bent at the knee joint from below. The injection point, the angle formed by the XII rib and the long back muscle along the bisector by 1 – 1.5 cm downwards. The needle is inserted perpendicular to the surface of the body and promoted, with a feeling of failure, the needle got into the paranephral space. The piston is pulled back, make sure there is no blood, 60-80 ml of 0.25% novocaine solution is injected.

**Intraosseous anesthesia.** The limb is isolated from the general blood flow by applying a cuff, an elastic bandage. The anesthetic is injected on the upper limb into the condyles of the shoulder, ulnar process, bones of the hand; on the lower limb – into the condyles of the thigh, ankle, calcaneus.

**Spinal anesthesia.** The introduction of an anesthetic into the subarachnoid space. The patient is seated across the table, the knees should be raised. Puncture is performed between the spinous processes LIII and LIV or LII and LIII. The landmark is the process L IV, located on the line of intersection of the connecting



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posterior upper awns of the iliac bones. the needle is inserted between the spinous processes with a slight downward slope of 5-10 degrees. when the ligaments are punctured, there is a feeling of failure, and when the dura mater is punctured, rotational movements. The appearance of cerebral fluid is the correct anesthesia. 1 ml of 5% novocaine or 0.5 – 0.8 ml of 1% sovcaïne solution is injected.

### General anesthesia.

General anesthesia or anesthesia is a condition characterized by a temporary shutdown of consciousness, pain sensitivity, reflexes and relaxation of skeletal muscles caused by the effects of narcotic substances on the central nervous system.

**Stages of ether anesthesia**, there are 4 stages: I – analgesia, II – arousal, III – surgical stage, IV – awakening.

Stage of analgesia (I) – the patient is conscious, but inhibited. There is no superficial pain sensitivity.

The stage of arousal (II) is the inhibition of the centers of the cerebral cortex, consciousness is absent from pronounced motor and speech arousal. The pupil is wide and does not react to light, cough often appears, vomiting may occur. Lasts 7-15 minutes.

Surgical stage (III) – depending on the depth of anesthesia, there are 4 levels of stage III anesthesia.

Level 1 – the patient is calm, breathing is even, the pupil is narrowed, the reaction to light is preserved. Muscle tone is preserved.

Level 2 – the movement of the eyeballs stops. Pupils dilate, breathing is calm and even. Decrease in muscle tone – perform abdominal operations.

Level 3 – deep anesthesia. Pupils are dilated, I react only to a strong stimulus. Complete relaxation of skeletal muscles. Shallow breathing, sinking of the tongue root, blood pressure is reduced. It is dangerous for the patient's life.

4 уровень-максимальное расширение зрачка, роговица тусклая, Сухожа. Пульс нитевидный, частый, паралич межреберных мышц. You can produce остановка дыхания and кровообращения.

Стадия побуждения (IV) - натсупает с прекращением анестезирующего вещества. DLI podavleniya function bluzhdajjeshego Nerva-provodya premedikaci, for 40 min to operacii-1 ml of 1-2% ratsvor promedol, or 1 ml of pentozocin and 2 ml of fentanyl.

### Intravenous anesthesia.

The advantages are a quick introduction to anesthesia. Short-term anesthesia.

Derivatives of barbituric acid – sodium thiopental, hexenal. The duration of anesthesia is maintained by fractional administration of 100-200 mg of the drug, the total dose of the drug should not exceed 1000 mg. Viadril is used at a dose of 15 mg / kg, the total dose is 1000 mg on average. It is more often used together with nitrous oxide. Viadril is used for introductory anesthesia, for endoscopic examinations.

Propanidide – 10 ml of 5% solution. IV, quickly 500 mg in 30 seconds, the duration of anesthesia is 5-6 minutes. It causes hypotension, is used for introductory anesthesia, for small operations.

Sodium oxybutyrate – IV, slowly. The dose is 100-150 mg / kg. It causes superficial anesthesia, is used for introductory anesthesia.

Ketamine – I / v, I / m, dose 2-5 mg / kg. It is contraindicated in patients with hypertension. It is used in the form of mononarcosis and introductory anesthesia.

Diprivan is a short-acting intravenous anesthesia. Ampoules of 20 ml of 1% ratsvor. The duration of anesthesia is 5-7 minutes. It is used for introductory anesthesia.

### Inhalation anesthesia.

Ether for anesthesia is oxidized and explosive under the influence of light. A strong narcotic substance, causes deep anesthesia. Reduces the functional ability of the liver.

Fluorotane is a colorless liquid with a sweet smell. It is not explosive, very fast transition from one stage to another – overdose is possible. It depresses the cardiovascular system and is toxic to the liver. Increases the sensitivity of the heart muscle to adrenaline and norepinephrine.

Chloroform is a colorless liquid with a sweet smell. Under the influence of light, a toxic substance is formed – phosgene. It is very toxic, currently practically unused.

Methoxyflurane is a colorless liquid with a fruity odor. Narcotic sleep occurs after 7-8 minutes. Reduces blood pressure, increases the sensitivity of the myocardium to adrenaline, norepinephrine.

Nitrous oxide is a "laughing gas", colorless, odorless. It is stored in a liquid state at a pressure of 50 atm. Anesthesia is used only in combination with oxygen, 1:1, 2:1, 3:1, 4:1, that is, 80% nitrous oxide and 20% oxygen. Weak narcotic effect, it is used for low-traumatic operations.

Cyclopropane is a colorless gas with the smell of oil. It is used only in a mixture with oxygen. It is explosive and has a strong narcotic effect. Increases the sensitivity of the heart muscle to adrenaline and norepinephrine, can lead to cardiac arrhythmia.

**There are 4 respiratory circuits.**

1. The open method. The patient inhales a mixture of atmospheric air, exhaling into the surrounding atmosphere of the operating room. Air pollution of the operating room with narcotic substances.
2. A semi-open method. Inhales a mixture of oxygen with a narcotic substance from the device and exhales it into the atmosphere of the operating room – the safest circuit for the patient.
3. Semi-closed - inhalation is performed from the apparatus, exhalation is partially into the apparatus, partially into the atmosphere.
4. The closed method is to inhale and exhale from the device into the device. It is economical and environmentally friendly.

Inhalation anesthesia can be performed by masking, endotracheal, and endobronchial methods.

Anesthesia machines. The main components of the anesthesia apparatus are 1) cylinders for gaseous substances (oxygen, nitrous oxide, cyclopropane); 2) dosimeters and vaporizers for liquid narcotic substances (ether, fluorotane, pentran); 3) respiratory circuit.

**There are three stages of anesthesia:**

Stage I – introduction to anesthesia. Introductory anesthesia – with any narcotic substance. Barbiturates, sombrevin fentanyl, promedol with sombrevin, muscle relaxants are mainly used and tracheal intubation is performed.

Stage II – maintenance of anesthesia. To maintain anesthesia, any narcotic substance (fluorotane, cyclopropane, nitrous oxide with oxygen), neuroleptanalgesia. Muscle relaxants.

Neuroleptanalgesia – nitrous oxide with oxygen, fentanyl, droperidol, muscle relaxants are used.

Anesthesia is maintained by inhalation of nitrous oxide with oxygen in a 2:1 ratio, fractional intravenous administration of fentanyl and droperidol 1-2 ml every 15-20 minutes. It is safer for the patient.

Stage III – withdrawal from anesthesia. The introduction of narcotic substances is gradually stopped. The patient regains consciousness.

Complications of anesthesia – vomiting, aspiration, regurgitation. Respiratory complications – foreign bodies can get in – teeth, dentures. Complications of tracheal intubation include damage to teeth with a laryngoscope blade, damage to the vocal cords, insertion of an intubation tube into the esophagus, insertion of an intubation tube into the right bronchus, exit of the intubation tube from the trachea or bending of it.

Complications from the circulatory system – hypotension, cardiac arrhythmia, cardiac arrest.

Complications from the nervous system – hypothermia, cerebral edema, damage to peripheral nerves.

**4. Illustrative material:**





## 5. Literature:

- Durmanov, K. D. Zhalpa surgery: okulyk / . - Karaganda: AKNUR, 2017. - 608 bet. S
- Gostischev V.K. General surgery: textbook and CD.– 4th ed. – M., 2016. – 832 p.;

## 6. Control questions (feedback)

1. Who discovered anesthesia for the first time and in what year?
2. What types of anesthesia do you know?
3. What advantages and disadvantages of local anesthesia do you know?
4. What indications and contraindications to anesthesia do you know?
5. How and when is premedication performed?

## Lecture No. 4


### 1. Topic: Acute local surgical infection.

**2.Purpose:** To teach to recognize the clinical picture of acute local surgical infections. Training in determining absolute relative indicators and contraindications to operations in acute local surgical infections. To teach the basic skills of first aid in acute local surgical infection, as well as the principles of modern comprehensive treatment..


### Lecture abstracts:

#### Surgical infection


Surgical infection is an inflammatory disease of different localization and nature caused by a pyogenic flora. By the end of the first day of life, the child is already inhabited by 12 species of bacteria. On the third or seventh day, they enter his intestines. As a child grows up, its microbial population grows rapidly. In the body of an adult, it is already represented by hundreds, the number of which reaches astronomical figures. It is estimated that the total weight of bacteria living in the human body is about two kilograms. There are about 200 species of microorganisms living in humans, and 80 of them are in the mouth. In the human intestine, there are normally from 300 to 1000 species of bacteria with a total weight of up to 1 kg, and the number of their cells exceeds the number of cells of the human body by an order of magnitude. They play an important role in the digestion of carbohydrates, synthesize vitamins, and displace pathogenic bacteria. But they are constantly changing, becoming more pathogenic. How many of them come to us with food, breathing, through dirty hands, during nursing and medical manipulations. Surgical infection is defined as the process of introduction and development of microbes into unusual habitats (wounds, internal organs and cavities, fiber). Patients with purulent-inflammatory diseases make up a third of all surgical patients. Classification 1. By clinical course: 1.1. Acute surgical infection: purulent; putrefactive (anaerobes that do not form spores); anaerobic; specific (tetanus, anthrax, etc.). 1.2. Chronic surgical infection: nonspecific (pyogenic); specific (tuberculosis, syphilis, actinomycosis, etc.). 2. For each of the listed forms, there may be forms: 2.1. Local surgical infection (with predominance of local manifestations); 2.2. General surgical infection (with predominance of general phenomena with septic course). Etiology Purulent-inflammatory diseases have an infectious nature (monoinfection or mixed, penetrating the body exo- or endogenous). The

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most common pathogen is staphylococci, which is explained by their high resistance to a/b and antiseptics, as well as their ability to secrete exotoxins. Streptococci are less common (they give severe intoxication), pneumococci, proteus, coli-bacteria, Pseudomonas aeruginosa, clostridium. Exogenous - airborne - airborne- dust- contact - implantation Endogenous - exacerbation of chronic foci of infection - hematogenic, lymphogenic pathways - contact (opening of purulent formations, hollow organs: gastrointestinal tract, etc.) Ways of infection penetration: Pathogenesis Further development of the inflammatory process is determined by the ratio of the number and virulence of invaded microbes with immunological forces the body. The condition of the tissues and local immune factors are also important. ! Germs trapped in the wound begin to activate after 5-6 hours . ! Clinical manifestations Local symptoms are classic signs of inflammation: • Hyperemia • Swelling • Pain • Local temperature rise • Organ dysfunction Distinguishes two phases of the inflammatory process: initially, the inflammatory focus is dense, the pain is constant (infiltrative phase); softening of the infiltrate, twitching pains, fluctuation indicates the development of the abscess phase. Common symptoms: • Fever, chills • Enlargement of regional lymph nodes • Agitation or lethargy of the patient • Headache, feeling of weakness, tachycardia • Change in blood composition (leukocytosis, increased ESR, decrease in hemoglobin and erythrocytes) • Changes in urine (cylinder and proteinuria). Treatment principles Treatment depends on the characteristics and localization of the inflammatory process. Infiltration stage – conservative treatment (to limit the focus): - A/b, antiseptics, anti-inflammatory drugs - Physiotherapy (heat, UV, UHF, electrophoresis, ultrasound, etc.) - Novocaine blockades - Rest (immobilization, bed rest) The stage of abscess formation is surgical treatment: a) Opening of the abscess to remove pus and necrotic masses. b) Thorough sanitation with antiseptics (hydrogen peroxide, furacilin) c) Adequate drainage d) The use of hypertensive solutions (10% NaCl, 25% MgSO<sub>4</sub>). Types of local surgical infection Abscess (abscess) is a delimited accumulation of pus in organs and tissues. Causes: infection, injection of concentrated drug solutions into tissues (25% MgSO<sub>4</sub>, 24% cardiomine solution, 50% analgin solution). The abscess is characterized by the presence of a pyogenic shell and a multicamber. Phlegmon is an acute diffuse inflammation of the fiber, not prone to delineation. Subcutaneous, intermuscular, retroperitoneal phlegmon are distinguished; some localizations have special names: mediasthenitis, paraproctitis, paranephritis, etc. Phlegmon has no clear boundaries. The infiltration phase is short. Treatment is only operative. Erysipelas (erysipelas) is an acute inflammation of the skin itself, less often of the mucous membranes. The causative agent is streptococcus. This explains the contagiousness of this disease. The disease occurs suddenly, the temperature rises rapidly (up to 40-41), severe intoxication is observed. It is more often localized on the face, head, and lower extremities. Local symptoms: burning pain, a feeling of heat, the appearance of bright redness with clear jagged borders (erythematous form). With a bulbous form, bubbles appear. With a phlegmonous form, suppuration of subcutaneous tissue appears. Necrotic erysipelas occurs in the weakened and elderly. Erysipelas can recur. Treatment: 1. Ufa. 2. A/b and sulfonamide preparations. 3. Wet bandages and baths are contraindicated, synthomycin emulsion and tetracycline ointment are used topically. 4. With a phlegmonous form, an autopsy is performed. 5. Patients should be isolated. 6. When the process is localized on the face, hospitalization is mandatory. Furuncle is a purulent necrotic inflammation of the hair follicle, sebaceous gland and surrounding subcutaneous fat. The most common localization is the back of the neck, face, back of the hand, hip. The appearance of two or more boils is called "furunculosis", which occurs with decreased immunity, diabetes mellitus, vitamin deficiency, etc. Carbuncle is an acute diffuse purulent necrotic inflammation of several hair sacs and sebaceous glands with the formation of a common infiltrate and necrosis. The treatment is operative, the incision is cruciform. The triangle of death is a place on a person's face limited by the mouth, nose and nasolabial folds, where the blood supply is very well developed. In this part of the face there are a huge number of vessels of the venous and arterial network, and these veins do not have valves (unlike veins in other parts of the body). Thus, any infection that can enter the body through the "triangle of death", elementary penetrates into the cavernous sinuses of the brain, causing very serious complications and often human death. Everyone knows that there are a large number of microbes on human hands, so touching this "triangle" with your hands is not something that is not desirable, but

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simply FORBIDDEN! Hydradenitis is a purulent inflammation of the apocrine sweat glands. It is localized in the axillary, less often in the genital and perianal areas. Predisposing factors: excessive sweating, dermatitis, non-compliance with personal hygiene rules, shaving hair, the use of depillators. Lymphadenitis is an inflammation of the lymph nodes that occurs as a complication of various purulent-inflammatory diseases and specific infections. Lymphangitis is a secondary inflammation of the lymphatic vessels, exacerbating the course of various inflammatory diseases. Mastitis is an inflammation of the breast. It occurs mainly in the first weeks of lactation (lactation mastitis, or "breast"). It occurs more often in primiparous (up to 70%), acute and chronic (rarely) are distinguished. The entrance gate is most often cracked nipples. The factor contributing to the occurrence of the disease is lactostasis. There are serous, infiltrative and destructive (abscessing, phlegmonous, gangrenous) forms of mastitis. Clinic. The appearance of pain in the mammary gland, an increase in temperature to 39 ° C, redness and enlargement of the breast (serous form). During the transition of the process to the infiltrative phase, chills appear, infiltration occurs in the gland, pain increases, axillary l.u. increase, With the appearance of fluctuation – sharp redness of the skin and expansion of the subcutaneous venous network, the infiltrate is delimited and palpated. Treatment. They are carried out taking into account the shape. In initial forms, it is conservative, in purulent forms, it is operative. When signs of stagnation of milk appear, an elevated position (bandage, bra, which do not squeeze the gland). To empty the gland, a breast pump is used, fluid intake is limited, oxytocin and no-shpu are prescribed, feeding is not stopped. With serous and infiltrative – a /b, sulfonamides, physiotherapy, novocaine blockade. All procedures are performed after emptying the gland. Prevention. 1) Increasing the resistance of the pregnant woman's body, rehabilitation of foci. 2) Preparation of the gland for feeding (air baths, rubbing with a towel), prevention of nipple cracks. 3) Follow the rules of feeding (position of the mother, hygienic treatment), alternate glands. 4) Pumping after each feeding 5) Mandatory bra wearing. Arthritis is an inflammation of the joint. There are three types of arthritis: traumatic, infectious, and dystrophic. Symptoms: pain, redness, swelling, deformity, impaired joint function, fever (local and general). Treatment: depends on the cause. In case of purulent arthritis, an autopsy of the joint, antibiotics. Arthritis can result in complete recovery, but it can disfigure the joint and lead to immobilization. Bursitis is an inflammation of the mucous bags. There are acute and chronic (hygromas). Reasons. Injuries, repetitive physical stress, arthritis, gout. Bursitis of the elbow, shoulder, and knee are more common (occupational injury). Symptoms. The appearance of painful rounded swelling, according to the location of the mucous sac, is a symptom of patellar balloting, weakness, and an increase in body temperature. Unlike arthritis, movement in the joint is preserved. Treatment. In the early phases – joint puncture, a/b, hormones, physiotherapy. If ineffective, the bag is opened. Healing is slow. Mucosal bags are limited connective tissue bags with a smooth endothelial surface that secretes synovial fluid. The number of these bags is not constant: newborns may not have them, adults have a lot of them, and in different places; they can form in places of continuous pressure and friction of skin, muscles, tendons against bones. Osteomyelitis is an infectious inflammation of bone tissue. There are acute and chronic, hematogenic and non-hematogenic. Symptoms. Malaise, aching limbs, muscle aches, fever, headache. Severe pain of a drilling, bursting nature appears in the affected limb, which is why patients scream at the slightest movement. The limb acquires a semi-bent position. Pounding on the heel (elbow) causes severe pain, palpation of the affected limb is painful. Then there is swelling of soft tissues and redness of the skin, regional l.u. Signs on the X-ray appear on the 10th-14th day. Treatment is conservative and operative. Panaritium is a purulent disease of the fingers. There are the following types of panaritium: cutaneous, subcutaneous, tendon, bone, articular, subungual, paronychia, pandactyl. Symptoms: gradually increasing, twitching pains, tissue tension, hyperemia, swelling, a symptom of the "first sleepless night". Body temperature can be normal or elevated (depending on the shape). The finger functions are broken. The treatment is operative. Phlegmon of the hand is a diffuse purulent lesion of the cellular spaces of the hand. Symptoms: edema and hyperemia of tissues, impaired hand functions, local fever, pain on palpation, changes in the appearance of the hand (for example, the "clawed paw" symptom), body temperature rises, symptoms of intoxication. Treatment is only

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operative General surgical infection (sepsis) Generalized (general) infection develops when the body is unable to neutralize pathogens that have entered the bloodstream. This is observed : 1) when a large number of highly virulent pathogens are received; 2) With a sharp weakening of the body's defenses. The place of introduction of infection into the body is called the entrance gate. Inflammation that occurs in the area of the entrance gate is called a primary focus (wounds, acute purulent foci, endogenous infection). There are: - primary (cryptogenic) sepsis, which develops in the absence of a visible focus; - secondary sepsis, which develops against the background of a primary focus. In addition, sepsis is distinguished: - lightning - fast (the clinic develops rapidly, after 1-3 days it can lead to death); - septic shock (severe phase of sepsis that develops due to intoxication in the presence of a purulent focus); - acute (rapid increase in the clinic, but not so catastrophic development); - subacute (established in 2-3 days). months after the onset of the disease); - chronic recurrent form. Sepsis is also classified according to the location of the entrance gate (umbilical, obstetric, odontogenic, otogenic, etc.). Acute sepsis can occur in the form of septicemia and septicopyemia. Septicemia (generalized blood infection) - prolonged flooding of the bloodstream with pathogens and their toxins, which come from the wound periodically. Most often these are streptococci, less often-staphylococci and Escherichia coli. The clinical course is characterized by an amazing chill and a rapid increase in temperature, which during the day is constantly kept in the range of 40-41<sup>o</sup> with a simultaneous increase in pulse and respiration. Only shortly before death, the temperature drops sharply to normal, and the pulse becomes faster (do not count). The cross formed by the temperature and pulse curves is called the death cross. Patients become sluggish or restless, the skin is dry, hot, sometimes with subcutaneous hemorrhages. The wounds are dry, dull, sluggish granulating. The spleen is enlarged and painful on palpation. Hemolytic jaundice develops. Septicopyemia (common metastatic infection). In this case, small blood clots in the area of a purulent wound become infected with microbes and enter the general bloodstream. Blood vessels serve as transport routes through which infected emboli enter any organ – a new secondary focus is formed. Clinically, there is an amazing fever of up to 41<sup>o</sup>, but in the morning it decreases by 3-4<sup>o</sup>. Rapid pulse, shortness of breath. The general condition is severe, patients complain of joint pain, the skin is hot and dry. Anemia, jaundice, enlarged spleen, and toxic diarrhea are often found. With the development of purulent metastases in the brain, death can occur. Septicopyemia and septicemia are often difficult to distinguish and can develop into one another. Diagnosis of sepsis is based on an assessment of: 1. The primary focus (in 95% of cases, sepsis develops against the background of severe purulent surgical or extensive wounds with necrosis, poor drainage, etc.). 2. The results of blood seeding (seeding pathogens from the blood is the best sign of sepsis; the material is taken at different times of the day, preferably at the height of fever). 3. Clinical symptoms (sepsis is characterized by an enlarged spleen, liver, hemolytic jaundice, leukocytosis or leukopenia, a sharp increase in ESR, severe disorders in the coagulation system, tachycardia, high fever) Types of fever in sepsis: Continuously high, 39-40<sup>o</sup>, reflects an acute, severe course. Remitting – daily fluctuations of 1-2<sup>o</sup> for 15-20 days. Undulating - periods of subfebrility alternate with high fever peaks; in subacute cases, sepsis treatment consists of: \* active surgical treatment of the infection site • intensive treatment of the pathogen (antibacterial and immunotherapy, extracorporeal detoxification methods) \* maintenance of impaired body functions (infusion therapy) Patients with sepsis should be treated in special intensive care units for patients with severe purulent infection. Subclavian vein catheterization is performed for prolonged infusion Anaerobic infection Anaerobes and their associations with aerobes belong to one of the leading places in human infectious pathology. They make up the absolute majority of the normal microflora of the human body. Their main habitat is the digestive tract. The flora in the mouth is

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99% anaerobic, which is close to the colon, their main habitat. Among the variety of types of these microorganisms, the causative agents of tetanus and gas gangrene – representatives of clostridial infection, which cause extreme severity and high mortality, are of particular importance. But clostridia make up a very small part of the anaerobes found in humans (about 5%). There is also a much larger group of anaerobes that are pathogenic to humans and do not form spores. They represent a large part of everyday surgical infections and can be characterized mainly by local manifestations and a benign course, or have a clinic of severe processes with an unfavorable prognosis. Gas gangrene is the most life-threatening complication of wounds of any origin. It is most common during combat operations. The probability of its development is higher with extensive crushed wounds with damage to blood vessels and bones, contamination with earth by pathogens are four types of clostridium, which secrete exotoxins. All clostridia are characterized by gas formation and edema formation. Clinic. The incubation period is 3-4 days, but can last up to 2-3 weeks. The beginning is rough. There are pains in the wound, a feeling of bursting and squeezing. As the swelling increases, these sensations increase. There is tachycardia, euphoria, low-grade fever. There are three forms of clostridial wound infection: 1. Clostridial myositis 2. Clostridial cellulitis 3. Mixed form. In all forms, the wound has a characteristic appearance: the tissues are lifeless, dirty gray in color, the discharge is scanty, sukrovichnoe. There may be a "razor symptom", crepitation, the muscles look like boiled meat (cl. myositis). With cl. cellulitis, first of all, the skin changes, which becomes tense, shiny, and drained of blood (erysipelas or white edema). In other forms, purple-cyanotic spots and blisters appear on the skin. Gas is distributed quickly in the tissues, and after a few hours crepitation is noted far from the wound. For diagnostics, in addition to clinical data, a tank is required. research. Treatment. It consists of three components. 1. Sanation of the wound focus with the elimination of the bacterial factor. Three types of operations are used: "lampasny incisions" (a wide dissection of tissues to the bone to aerate the wound and remove toxins accumulating in the edematous fluid); excision of affected tissues (muscles); amputation, which is performed without a tourniquet, above the visual level of tissue viability, stitches are not applied for 1-2 days. 2. Neutralizing the effects of circulating toxin: antibacterial therapy (penicillins in very high doses); serotherapy (polyvalent serum for prevention in a dose of 10 thousand mg). IU and for therapeutic purposes in a dose of 150 thousand rubles. IU, monovalent serum in / in drops, dissolving 100 ml of serum in 400 ml of NaCl-0.9%); HBO. 3. Correction of changes in the functions of organs and systems. Prevention. 1. Fight traumatic and hemorrhagic shock. 2. Transport immobilization, as early as possible PHO. 3. Isolation of patients. 4. For disinfection, sanitation, cleaning of premises, use 6% hydrogen peroxide with 0.5% detergent solution, for medical instruments – 1 h. 5. At the entrance (and exit) to the ward, change work clothes (dressing gown, shoe covers) Tetanus The causative agent of tetanus is the spore-forming G (+) of Clostridium tetani. Its spores are highly resistant, they can withstand boiling from 10 to 90 minutes, and some strains-up to 3 hours. A 5% solution of phenol causes their death in 8-10 hours, and a 1% solution of formalin-in 6 hours. Direct sun exposure is maintained for 3-5 days, but vegetative forms die at a temperature of 60-70 ° C in 30 minutes and using dez. facilities. The pathogen releases an exotoxin that affects the nervous system and red blood cells. Immunity after the disease is absent. Clostridium tetani lives in the intestines of animals and humans. It gets into the soil with feces, where it forms spores that persist for many years. Infection occurs only when spores enter through wounds, especially when anaerobic conditions are created in them (stab wounds, vascular pathology) Clinic. The leading symptom is the development of clonic and tonic skeletal muscle spasms. During the incubation period, which usually lasts 4-14 days, headache, insomnia, irritability, malaise, sweating, pain and muscle twitching in the wound area are noted.

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Muscle spasm begins either in the jaw muscles (descending type) or in the area of the wound (ascending type). The face is distorted and characterized by an expression of contemptuous laughter (sardonic smile) with the formation of wrinkles on the forehead and cheeks. Trismus (cramps of the masticatory muscles) makes it difficult to open the mouth. Seizures follow each other, are painful, occur with any irritation (touch, creak of the door, light, loud conversation). Spastic contraction of the muscles of the back, neck, and limbs is accompanied by a sharp overextension of the trunk and limbs (opisthotonus). Convulsions last up to several minutes. In the gaps, the muscles remain tense. Seizures can lead to muscle tears, bone fractures, and respiratory and circulatory disorders. Body temperature is high, profuse sweating, not corresponding to the height of the temperature.. Tonic contraction of the perineal muscles makes it difficult to defecate and urinate. With recovery, the symptoms gradually decrease and disappear after 14-70 days. Tetanus should be distinguished from trigeminal neuragia, meningitis, rabies, tetany, etc. Treatment. Intensive care and surgical interventions are performed. General treatment includes: 1. Specific serotherapy (introduction of PSS and AS). 2. Anticonvulsant therapy (muscle relaxants, drugs, alcohol, neuroplegics); anesthesia is used to turn off consciousness. 3. Auxiliary therapy to improve the activity of the heart, respiration, prevention of infectious complications. Surgical interventions consist of the following: revision, wide opening, drainage of the wound under anesthesia. The patient is placed in a separate room, isolated from noise, darkened. An individual observation post is organized.

Prevention.

Specific emergency:

1. Use of PSS and AS. Only 0.5 ml of AC is administered to the vaccinated, but if 5 or more years have passed since the last vaccination, 1 ml of AC is administered. After six months, another 0.5 ml of AC is re-administered. 2. PSS is administered from the age of 20 only to unvaccinated people using the Bezredko method. A specific routine is carried out according to the vaccination calendar. Non-specific – timely and complete PHO

**4. Illustrative material:**







## 5. References:

- \* Durmanov, K. D. General surgery: textbook / . - Karaganda: Aknur, 2017. - 608 P. S.
- Gostischev V. K. General surgery: textbook and CD. - 4th ed. - Moscow, 2016. - 832 p.;

## 6. Security questions (feedback)

1. Classification of surgical infection
2. Etiology and pathogenesis of purulent infection.
3. Local reaction of purulent infection
4. General reaction of purulent infection
5. General principles of treatment of purulent infection ( conservative, operative )
6. Antibacterial therapy, tests.


## Lecture # 5

### 1.Topic: Closed and open mechanical damages.

**2. Objective:** To develop and strengthen knowledge in general traumatology. Teach you to distinguish between different injuries based on their clinical manifestations. Training in proper diagnosis and trial diagnostics of various types of injuries. Training in first aid for various open and closed injuries and their complications, the use of modern complex treatment methods. Training in first aid for various injuries, applying a transport bandage, dressing, carrying. Familiarization with the specifics of caring for patients with various injuries.

### 3. Lecture theses:

Traumatology-the science of injuries Trauma is the impact on the body of an external factor that causes anatomical and functional disorders in tissues and organs, which are accompanied by a local and general reaction. Traumatism is a set of injuries that affect the same population groups under certain circumstances. Injuries are divided into industrial and non-industrial injuries. This division has important social and legal significance. In case of an industrial injury, the company fully pays


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the costs of treating the victim, from the first day the victim is issued a disability certificate with 100% payment, if necessary, a special pension and compensation. In Russia, an injury received in the workplace while performing official duties, as well as on the way to work and home, is considered industrial. In case of non-industrial injury, the disability certificate is issued from the sixth day and it is paid in accordance with the rules adopted in the industry: work experience, position, etc. Depending on the type of activity in which the injury was received, agricultural, industrial, transport, street, sports, school, military, domestic and intentional injuries are distinguished. In recent years, there has been a tendency for injuries to come out on the second place in the overall structure of mortality. Injuries take the 3rd place among the causes of disability. In Russia, about half of the cases are caused by domestic injuries, transport injuries account for about 40%, and industrial injuries account for 5-6%.

Organization of trauma care. Trauma care consists of the following components: first aid, outpatient inpatient treatment, and rehabilitation. First aid should be provided by a doctor, secondary medical personnel, or other people on a self - and mutual assistance basis. In this case, the role of sanitary and educational work among the population is important. Everyone should have the skills to provide medical care, especially representatives of the police, fire service, military personnel, and drivers of vehicles. When providing first aid at the scene of an accident, it is necessary to carry out transport immobilization, anesthesia, apply a bandage, stop the bleeding, and perform basic cardiopulmonary resuscitation. To provide qualified medical care, the victim is taken to a medical institution. When transporting the victim, it is necessary to properly lay him down and quickly deliver him to the emergency room or trauma department. Outpatient treatment of a traumatological patient is performed in specialized trauma centers. X-ray examination, primary surgical treatment of wounds, application of conventional and plaster bandages, as well as complex treatment and follow-up treatment of victims after discharge from the hospital are performed here. Inpatient treatment of traumatological patients is carried out in specialized departments of city and district hospitals, in clinics at the departments of traumatology and orthopedics of medical universities, in the Research Institute of Traumatology and Orthopedics. Rehabilitation of the victim plays an important role. Rehabilitation is carried out in trauma hospitals, trauma centers, polyclinics at the place of residence of patients, special rehabilitation centers and sanatoriums where the restoration of lost functions is carried out. Classification of damages.

Injuries are divided into single and multiple, closed and open. Injuries to the musculoskeletal system combined with damage to internal organs are called combined trauma. When various injuries are combined (fractures, burns, concussion, etc.), they indicate a combined injury. Closed soft tissue injuries include: contusion, sprain, tissue rupture, concussion, and prolonged compression syndrome. Dislocations and fractures of bones can be closed or open.

A bruise. A bruise is a closed mechanical damage to soft tissues and organs without a visible violation of their anatomical integrity. Bruises can be an independent injury or accompany other more serious injuries. The cause of the injury may be a fall from a small height or a light blow. Bruises are superficial and internal organs. The main clinical manifestations of a bruise are pain, soft tissue edema, hematoma, and impaired function of the damaged organ. The pain occurs immediately at the time of injury, then subsides a little. The swelling usually remains limited and painful. The size of the hematoma depends on the depth of the lesion. Violation of the function of the damaged organ with a bruise usually occurs not immediately, but as the edema and hematoma increase. The patient complains of limited active movements associated with pain. Passive movements are usually preserved. When providing first aid, it is necessary to apply a pressure

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bandage and cold. Treatment is carried out on an outpatient basis. On the first day, to reduce soft tissue edema and hematoma, cold is applied or the site of the bruise is treated with chloroethyl. An immobilization soft bandage is applied to the joint area. To reduce the hematoma, you can apply a pressure bandage. To reduce edema, an elevated position of the limb and troxevasin ointment are used. After 4 reduction of edema and hematoma (2-3 days), thermal procedures are applied: dry heat, ultraviolet radiation, UHF therapy.

Sprains. Stretching is called tissue damage with partial tears while maintaining anatomical integrity. Stretching usually occurs with sudden or sudden movement. Ligaments and tendons are more often damaged, but muscles, fascia, and nerves can also be damaged. The clinical picture of stretching resembles a bruise, but all the symptoms are most pronounced. When providing first aid, it is necessary to apply an immobilization bandage and cold. Treatment is carried out on an outpatient basis: rest for the limb, cold followed by thermal procedures.

#### Gap

A rupture is a closed damage to tissues or organs with a violation of their anatomical integrity. Severe stretching of the tissues can cause them to tear. Ligaments, tendons, muscles, fascia, and nerves are usually damaged. Torn ligaments. Ligament rupture can occur as an independent injury, or in combination with a dislocation or broken bone. Most often, the ligaments of the ankle and knee joints are damaged. In this case, there is severe pain, soft tissue edema, hemarthrosis and limited joint function. Hemarthrosis (the presence of blood in the joint) is determined by the symptom of balloting in the joint or by radiography ( expansion of the joint gap). When providing first aid, it is necessary to apply a transport tire and cold, and perform anesthesia. Treatment consists in applying a plaster splint for 2-3 weeks, followed by gradual restoration of the load on the joint with the help of physical therapy, physiotherapy is also necessary. With hemarthrosis, joint punctures are performed. Sometimes when ligaments are torn, surgical treatment is performed.

Muscle tear. A muscle tear can occur with a rapid, strong contraction or a strong blow to the contracted muscle. When damaged, severe pain appears, a growing hematoma, soft tissue edema, loss of muscle function, and a defect ( gap) in the muscle is palpated. When providing medical care, it is necessary to apply a pressure bandage, cold, immobilization splint, and anesthetize in one of the following ways. Treatment is carried out in the trauma department of the hospital. In case of incomplete rupture, observation, cold at the site of damage, application of a plaster splint for 2 weeks. From 3-4 days physiotherapy procedures are shown, after removing the plaster splint — physical therapy. In case of complete muscle rupture — surgical treatment ( muscle stitching), applying a plaster cast for 2-3 weeks. After removing the cast— physiotherapy and physical therapy. Tendon tear. The most common rupture of the extensor tendons of the fingers of the hand, Achilles tendon, long head of the biceps brachii muscle. When a tendon is torn, there is pain, soft tissue edema, loss of function of the corresponding muscle (flexor or extensor) while maintaining passive movements. During first aid, immobilization with a tire, anesthesia, and cold are applied. Treatment of tendon tears is operative: suturing the tendon and applying a plaster cast for 2-3 weeks, followed by physiotherapy. Ruptured fascia. When the fascia is torn, there is pain, soft tissue edema, palpable muscle hernia. 6 When providing first aid, it is necessary to apply a pressure bandage, cold, immobilization splint. Treatment of fascia rupture is only operative: suturing the fascia, maintaining rest and physiotherapy. Nerve rupture. When a nerve is torn, there is a loss of sensitivity and movement along the damaged nerve. When providing first aid, it is necessary to apply a cold and immobilization splint. Treatment of a nerve tear is only operative:


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suturing the damaged nerve ends and applying a plaster cast, followed by physical therapy and physiotherapy.

**Dislocations.** Dislocation is an excessive displacement of the articular surfaces that form the joint, which is accompanied by a rupture of the articular bag, damage to the ligamentous apparatus, muscles, and blood vessels. Dislocations are divided into complete and incomplete, congenital and acquired, pathological and traumatic, complicated and uncomplicated. Incomplete dislocations or subluxations - incomplete displacement of the articular surfaces. Congenital dislocations - a violation of the development of any joint. Pathological dislocations are disorders of the joint surfaces due to diseases such as tumors, tuberculosis, osteomyelitis, etc. Traumatic dislocations can be open or closed. Dislocations occur due to a fall on an extended or bent limb, a blow with a fixed limb, excessive muscle contraction. Clinically, dislocation is manifested by pain syndrome, deformity in the joint area, changes in the limb axis and joint configuration, forced position of the limb, changes in the length of the limb, palpation of the joint ends, lack of active movements in the joint of the limb, with passive movements, springy resistance is noted. During diagnosis, an X-ray examination is mandatory. When providing first aid, it is necessary to perform anesthesia, apply immobilization of the limb with a splint or kerchief bandage, apply cold and conduct hospitalization in the trauma department or in the emergency room. After an X-ray examination, the dislocation is corrected under local or general anesthesia, sometimes with the use of muscle relaxants to relax the muscles. After the reduction, the X-ray examination is repeated and a plaster cast is applied. After removing the plaster cast, physiotherapy procedures and physical therapy are prescribed. Indications for surgical treatment are: open dislocation, dislocations with soft tissue rupture, long-standing unrecoverable and habitual dislocations.

**Fractures.** A fracture is a violation of the integrity of the bone. Classification of fractures: 1. By origin, fractures are divided into congenital and acquired. Congenital malformations occur with fetal malformations. Acquired diseases are divided into traumatic and pathological ones. Pathological fractures occur in diseases such as metastases of malignant tumors, tuberculosis, osteomyelitis, etc. 2. According to the presence of soft tissue damage, fractures are divided into open, closed and gunshot. 3. By the nature of bone damage, fractures can be complete or incomplete. Incomplete fractures include fractures, green twig-type sub-periosteal fractures, marginal fractures, and punctured fractures. 4. In the direction of the fracture line, transverse, oblique, longitudinal, comminuted, helical, driven, compression fractures are distinguished. 5. By the presence of displacement of bone fragments relative to each other, fractures can occur with or without displacement. The offset can be in width, length, angle, and rotation. 6. Fractures are divided into diaphyseal, metaphyseal, and epiphyseal fractures based on bone damage. 7. The number of fractures can be single or multiple. 8. According to the development of complications, complicated and uncomplicated fractures are distinguished. There may be complications such as traumatic shock, fat embolism, internal organ damage, bleeding, nerve damage, and the development of a surgical wound infection. 9. According to the complexity of damage to the musculoskeletal system, simple and complex fractures are distinguished. In simple fractures, there is a violation of one bone, and in complex fractures, the fracture is accompanied by a rupture of ligaments, capsules, dislocation or displacement of bone fragments. 10. By the presence of a combination of a fracture with other injuries. For example: bone fracture, organ rupture, tissue burn. concussion of the brain. Clinical symptoms are divided into absolute and relative. Absolute symptoms are symptoms, and identifying at least one of them is sufficient to make a diagnosis. Absolute symptoms include:

1. abnormal mobility defined outside the joint area,


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2. crepitation of bone fragments, determined by palpation or auscultation at the site of the fracture,  
 3. deformity along the limb axis (configuration change, rotation, lengthening or shortening of the limb, as well as palpation of bone displacement debris).

Relative clinical symptoms include: 9 1. Pain that is associated with constant character and increases during movement and under load along the axis, 2. hematoma at the fracture site, 3. soft tissue edema, 4. forced position limbs, 5. impaired limb function (painful flexion and flexion. extension, can not stand up with support on the limb, tear it away from the body. surface of the bed). When providing first aid it is necessary to stop the bleeding (if it is an open fracture) by applying a tourniquet or twist, treat the wounds and apply aseptic bandages, perform analgesia (enter analgesics, do case blockage), apply immobilization splints, cold in place fracture, conduct anti-shock therapy. After providing the first service after the patient is assisted in the supine position on a stretcher, they are hospitalized in trauma department or emergency room. For diagnostic purposes an X-ray examination of the damaged area is mandatory. limbs in two or three projections. In the treatment of bone dislocation fragments are repositioned (placed in an anatomically correct position). position). Reposition is performed with mandatory anesthesia and x-ray control after it. If after repositioning the displacement was eliminated, a plaster cast is applied. Gypsum board the dressing can be in the form of a splint, circular, striped or bridge-like in the presence of a wound, coxitic in the case of damage in the thigh area, thoracobrochial in the shoulder area. Duration of gypsum board immobilization the dressing depends on the location of the fracture. If after a one-time operation If the offset has not been eliminated, then a gradual correction is carried out. reposition of bone fragments, which consists in the imposition of skeletal stretching or performing compression-distraction osteosynthesis. In some cases, surgical treatment is performed-osteosynthesis. for skeletal traction, a Kirschner spoke is used, which is carried out by through the condyles of the tubular bones; CYTO brace, fixed to the spoke. The bracket is connected to the load using a system of blocks. For compression- In distraction osteosynthesis, spokes are passed through tubular bones outside the fracture zone in different planes . The spokes are fixed on the rings or semi-rings of a special device. During the treatment process, fragments can be compressed at certain stages. In the surgical treatment of fractures, the displacement of bone fragments is compared using various metal structures. For osteosynthesis, metal spokes, wire seams, plates with bolts, screws, nails and other structures are used. After this type of treatment, the patient may be treated on an outpatient basis. After 8-12 months, a second operation is performed to remove structures from the bones. After removing the plaster cast, traction or other structures, it is necessary to conduct physiotherapy and physical therapy. General treatment for fractures is of a general strengthening nature: rest, careful care of the injured limb, antibiotic prophylaxis, proper nutrition, vitamin therapy, administration of calcium preparations, correction of vascular disorders, immunocorrection and prevention of complications.

The main complications in the treatment of fractures can be:

1. post-traumatic osteomyelitis,
2. formation of a false joint (pseudoarthrosis), to improper fusion of the fracture,
3. muscle contractures
4. violation of venous outflow, arterial blood supply, innervation, 5. pressure sores
6. joint contracture (incomplete movement in the joint)
7. ankylosis of the joint (joint immobility)
8. muscle atrophy.

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The causes of slow consolidation (fusion) of fractures are: impaired blood circulation of the limb, poor immobilization, infectious diseases, beriberi, cachexia, diseases of the endocrine system. To prevent complications, it is necessary to follow all the rules of first aid, carry out the correct reposition of bone fragments, observe the terms of immobilization, conduct X-ray monitoring, physiotherapy and physical therapy Patient care in the treatment of fractures. If the patient has a plaster cast, then a number of rules must be observed. The strength of the plaster cast develops gradually, and not immediately. After it is made, the patient's limb should be supported without putting it on the table until it hardens. After 5-10 minutes, the cast limb is already in a hardened, but still wet plaster cast is placed on semi-rigid pillows. After 10-15 minutes, you can put the patient to bed, while maintaining a horizontal position for the lower limb, and the upper limb should be tied up with a kerchief. The patient should be placed on a shield or rigid functional bed, so as not to break the plaster cast. The plaster cast is left open until it dries. For better drying of the dressing, it is necessary to periodically rotate the patient. 2 hours after applying the bandage, the limb should be examined: the presence of edema indicates a tight bandage, cyanosis of the nail phalanges indicates venous stasis, sensitivity and movement of the fingers should be preserved. If there are any violations or the bandage presses, 12 then it is redone. Do not let the discharge from the wound permeate the plaster cast, destroying it and causing maceration of the skin around the dressing. If there is a wound, a non-thick layer of cotton wool is placed under the edges of the plaster cast, which will prevent the discharge of the wound from flowing under the dressing. The patient in a plaster cast should be treated appropriately and kept clean. Wash yourself at least once every 7 days, covering the plaster cast with a film. The position of the cast limb should be raised. In skeletal or band-aid stretching, the arm is placed on a CITO splint, and the leg is placed on a Belera splint, on which a linen hammock is put. The tension of the hammock should be moderate. These splints give the limb a position of physiological rest. A cord is attached to the arc in which the spoke is fixed and thrown over the block. A load is suspended from it. When pulling on the CITO tire, traction is carried out using a spring. Under the mattress, you need to put a boardboard shield so that the bed does not sag. When treating the bones of the lower extremities, it is advisable to raise the foot end of the bed on special supports. During traction treatment, the patient is on long-term bed rest, so it is very important to care for him and prevent complications, the most important of which are bedsores, lung diseases and bone osteomyelitis. From the first days, physical therapy, breathing exercises and massage are provided. To prevent pressure sores, the patient's skin is wiped with camphor alcohol, rubber circles and pads are placed. To prevent the foot from sagging, it is suspended using a hammock or a bandage glued to the sole, thrown over the block. A load of 0.5 kg is suspended from the bandage. In order to give the tire with the entire traction system a stable position and ensure that the patient is properly laid, it is necessary to put a wooden shield between the bed net and the mattress. To pull the patient over the bed, strengthen the Brown frame. Rearrange the bed and serve the vessel to the patient very carefully, so as not to cause displacement of the wreckage. 13 The medical nurse should constantly monitor the patient's position, as an incorrect position can lead to complications: incorrect fusion of the fracture, paralysis of the limb. It is necessary to make sure that the limb does not rest against the headboard of the bed, and the weight does not fall to the floor. To prevent surgical infection, the needle insertion sites are treated with antiseptic alcohol solutions, the spokes are wiped with alcohol, and napkins moistened with alcohol are placed around the spokes at the injection sites several times a day, wetting it with alcohol using a pipette. The Ilizarov device is applied to the limb during treatment by compression-distraction method. With this method of treatment, the patient can walk

on crutches. Ilizarov's device should be covered with a cloth armband. Needle insertion sites are treated with alcohol and covered with sterile napkins.

#### 4. Illustrative material:



#### 5. Literature:

- Durmanov, K. D. Zhalpa surgery: okulyk / .- Karaganda: AKNUR, 2017. - 608 bet. S
- Gostischev V.K. General surgery: textbook and CD.– 4th ed. – M., 2016. – 832 p.;

#### 6. Control questions (feedback)


1. What types of injuries do you know?
2. What special signs of various injuries do you know?
3. What types of immobilization do you know?
4. What complex measures are advisable to carry out with double injuries?
5. What is the danger of timely medical care for various injuries?

### Lecture # 6

#### 1.Topic: Closed and open mechanical damages. Desmurgia. Transportation

**2. Objective:** To develop and strengthen knowledge in general traumatology. Teach you to distinguish between different injuries based on their clinical manifestations. Training in proper diagnosis and trial diagnostics of various types of injuries. Training in first aid for various open and closed injuries and their complications, the use of modern complex treatment methods. Training in first aid for various injuries, applying a transport bandage, dressing, carrying. Familiarization with the specifics of caring for patients with various injuries.

#### 3. Lecture theses:

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During an injury, we sometimes go to the emergency room for help. The trauma center has: a small operating room, a plaster cabinet, a treatment room, a patient reception room, a storage department, and a resident's room.

In accordance with PHC, the trauma center provides the following medical services:

- \* - Examination of patients and diagnosis of injuries;
- \* - Reposition of the fracture.
- \* - Setting the joint exit in place;
- \* - Immobilization with gypsum;
- \* - Clap blood lift;
- \* - Cleaning the wound, thrashing asptic dressings;
- \* - Surgical cleaning of primary injuries (suturing the injury);
- \* - Primary surgical cleaning of the finger recorder tendon;
- \* - Primary surgical cleaning of the finger nail plate during traumatic extraction, with the formation of a finger stump;
- \* - Emergency prevention of tetanus; (PSS, ADS-M);
- \* - Acute prevention of rabies; (CAV, EQUIRAB).

If you are bitten by a tick, the direct route isto the emergency room. There's a vaccine for tick-borne encephalitis, and before you ask for help, you need to ring the bell and get some advice.

Symptoms of a fracture;

- \* - catt's disease of the broken earth (urgent, this earth's disease).
- \* - violation of the stop-call function
- \* - obvious with a complete fracture and less pronounced with an incomplete fracture or with a fracture of one of the bones of the limb;
- \* - opening of bones (during examination or measurement);
- \* - suppression of the shape of the bones of the extremities (deformity-flexion);
- \* - the presence of abnormal movement in the affected area (during a forceful examination);
- \* - sometimes creaking or creaking of the bone (abrasions of fractures-you can feel or hear with your hands);
- \* - sometimes an increase in body temperature (up to -38°C in the first days);
- \* - fractures of the skull, ribs, spine and pelvis reveal signs of damage to the brain and spinal cord, lungs, bladder, rectum and others.

General rules of first aid (PHC) for open and closed fractures


- \* 1. Much attention is paid to the inelasticity of fractures (ulcerative shock, bruising, etc.) in SMP. First of all, in case of shock or departure from the Can artery (a tourniquet is applied for a short time), fattening is indicated. For fractures of large tubular bones (femur, etc.), the patient is given painkillers (promedol, morphine, etc.) to prevent shock and reduce pain. Morphine can be used for fractures of the ribs, pelvis, etc.
- \* 2. the affected leg must be immobilized (using fixing bandages or supporting frames that ensure mobility and calmness of the arms and legs, body parts).

They are:

- \* - reduction of pain (prevention of shock);
- \* - prevent the occurrence of wound-healing injuries (soft tissues and internal organs);
- \* - reduce the risk of occurrence and development of wound pain in an open fracture;
- \* - helps to create favorable conditions for bone fractures.

In case of a femoral fracture: the victim is placed on a sheet covered with veneer (takai or plywood) and immediately taken to a medical facility. Fractures are simple (violation of the integrity of the femur) and complex (violation of the integrity of the femur); as well as fractures of the femur-with the exit of the femur and without suturing the femur. The latter are characterized by increased mobility and pain of the pelvic bone during asymmetry or dislocation. Dislocation of the femur is unnatural, the position of the hip is fixed by a spring, which occurs if the head changes. In severe fractures, bleeding reaches 1.5-3 liters. The first medical



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lunge is performed with the extraction of the victim on a flat stretcher laid on his back, with a small cape under his chin.

For injuries to the extremities

- Check the presence and symmetrical change or deformation of the pile.
- check capillary fullness and distal pulse.
- assessment of sensitivity, flexion, muscle strength and symmetry of foot movements (sign of a leg fracture: hemorrhage due to edema, hematoma, local disease-increased disease under load on the axis; inability to move and disrupt the function of the foot, the most obvious sign: lengthening or shortening of the foot, deformity of the foot axis, pathological movement).
- Performing anesthesia
- Carrying out transport immobilization without repositioning the fracture.

(promedol 2% - 1ml or tramal 2ml used, instead of a fracture-novocaine 1-2% solution of 15-20 ml, for intra-articular fracture-puncture. In case of hand breakage: the following rules must be observed during the construction of the frame:

- \* - do not stretch the damaged stake.
- \* - for a wound and hemorrhage, first apply a bandage and tourniquet, then apply a frame on both sides of the arm;
- \* - both frames must cover the joints located below and above the fracture site;
- \* - before installing the frame, wrap it with a soft cloth or cotton wool. During the construction of the load-bearing frame, the stake is placed in a certain position:
  - \* in the number of Buche slightly tilted forward, bent at the elbow at a right angle;
  - \* in most cases, the palm is pressed against the stomach.
  - \* Kolya is slightly bent outwards, fingers partially bent, he puts a tight cotton knot wrapped around a bandage or jockey, on the sore spot of the iron. The victim squeezes it with his fingers

Trauma is a violation of health, violent damage to an organ or the body as a whole, caused by external influence.

Before the ambulance crew arrives, it is forbidden to move people who have been injured. The only exceptions are those cases when the patient needs to be removed from the source of danger.

One of the most common injuries is considered to be a fracture – a violation of the integral state of the bone, which is accompanied by sharp pain, swelling and deformity of the bone at the site of impact.

First aid for injuries

When providing first aid for fractures and dislocations, you need to:

Numb the affected area.

Treat the wound (with an open fracture), stopping the bleeding and applying a bandage;

Ensure that the broken bone is at rest with the help of tires (they can be made from improvised materials: boards, sticks), fixing them at least two joints with the center of the tire at the site of the fracture;

Apply a cold compress or ice to the fracture site.

When applying splints for a femoral fracture, the inner one should be fixed from the groin to the heel, and the outer one—from the armpit to the heel, while trying not to lift the leg.


If the spine is broken, but the injured person's back is not raised, fix a wide board or turn it to the position facing down. If the pelvic bones are damaged, lay the patient on a wide board, spread his knees to the sides, connecting the feet. To help with broken ribs, bandage the victim's chest. If this is not possible, try to pull it off with a towel while exhaling. Patients with fractures should only be transported on stretchers. Attempts to correct a dislocation or match bone fragments independently, without the help of a doctor, are prohibited, as they can have irreparable consequences. If the victim has a head injury, you must:

Lay the injured person on his back, providing him with rest and an immovable position;

If there is a wound, treat it and apply a sterile bandage;

Apply a tight bandage on the head, having previously fixed it on both sides with rollers;

Apply something cold to the affected area.

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If the victim is unconscious or the injury is accompanied by vomiting, carefully turn the head to the side.

First aid for sprains:

Fixing the affected area (using splints and bandages);

Cold compress on the injured area;

Providing the injured limb with complete rest until the doctor arrives.

Necessary first aid measures for bruises:

Apply something cold to the site of the injury;

Resting state for the affected area;

Tight bandage on the site of the bruise.

If the injured person is pinned down by the weight, it is necessary to release him and, having determined the type of damage, provide appropriate first aid

Types and symptoms of closed mechanical injury

Impact (contusio)

Closed injuries to tissues and organs caused by mechanical impact, the anatomy of which has not changed, are called bruises. This is caused by a bump or fall. The pathomorphology of soglu is diverse: there is reactive inflammation, hemorrhage, causing exudation and concentration of white blood cells. Over time, a liquid area of blood is sucked out, then fibrin. While half of the red blood cells are absorbed by the lymph node, half are destroyed there. Hemoglobin penetrates soft tissues and colors them in different colors. As soon as the hematoma resolves, connective tissue develops and, thus, a scar is formed.

Clinical signs: pain, shortness of breath, hemorrhage, impaired function. The hemorrhage increases 2-3 days after the injury and a bruise (bruise) appears on the site. Over time, the blood is pumped fragmentally, hemoglobin interacts with the tissues and changes the color of the hemorrhage site. It can be bluish-pink, green, or yellow. In many cases, the function of the limbs is impaired. joint movement is restricted.

Shake (commotio)

Closed mechanical injuries to tissues and organs whose morphological changes are not pronounced, characterized by impaired gum function, are called concussions. This happens under the influence of a rip wave, when it escapes from a height. Pathomorphology: with concussion, narrowing of small vessels is observed, then paralysis, stagnation of blood in the vessels, small focal hemorrhages and foci of dying tissues are detected. The disturbances that occur in shaikalu are short-lived and do not leave behind any obvious, permanent changes.


The clinical picture resembles shock. At the same time, the patient has a decrease in blood pressure, headache, dizziness, general weakness, adynamia, paralysis, symptoms of neuritis, pain in bones and joints, decreased visual and auditory sensations, sleep disorders, digestive tract dysfunction, ECG changes.

Compression (compressio)

If the damaging factor acts long and slowly, it leads to seizures. Although the external anatomical integrity of the skin is not visually impaired, soft tissues, nerves, and blood vessels are severely damaged, especially the muscles. Tense muscles are subject to various dystrophic processes and even death. If the vessels are squeezed, clots may form. As a result of spasms, deep ischemia, progressive intoxication, and tissue edema develop. Squeezing a large area of the body is characterized by a complex of specific signs - "prolonged squeezing syndrome". Treatment of bruises and seizures: administration of analgesics, restriction of hemorrhage in tissues, sedation of the patient, immobilization of the affected hands, application of local ice or cooling with chloroethyl. 2-3 days after the injury, when the pain and swelling stop, they prescribe impregnating drugs, apply local hot pressing, ultra-thin frequency (UHF), massage. If the hematoma is large, it is punctured or incised and drained. Anti-shock therapy is performed.

Stretching (distorsio)

Stretching-mechanical damage caused by the force of attraction, which does not cause violations of the anatomical integrity of tissues. Sprains of the ankle, knee and shoulder joints are common. It develops due to rapid and immediate movement to the joints. The pain that occurs when the ligaments of the joints are stretched quickly returns. In the affected area, there is a feeling of numbness, hemorrhage, swelling, aura.

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The joint function is not severely impaired. The diagnosis is made if there are no other pathologies of the joint during clinical X-ray examination.

Gap (rupture)

Rupture of subcutaneous tissue is accompanied by hemorrhage. A tentacle tear can be detected by palpation when the muscles relax. It appears in oblique or horizontal light. When a muscle is strained, it bulges out through a tentacle defined as a soft and elastic tumor, otherwise known as a "muscle hernia." Breaks may be incomplete or complete. Most often, muscles are torn in the position of stiffness and strong contractions: the quadriceps femoris, the rectus abdominis (when falling backwards), the calf muscle (when running and jumping), the long head of the biceps brachii (when lifting a heavy object). When a muscle is torn, there is a strong local pain, and palpation can reveal a crack that increases with muscle contraction.

A tendon tear is observed at the place where the tendon passes into the muscle or in the area of attachment to the bone. This is due to the fact that the muscles they are trying to stretch a lot. Most often, there is a separation of the Achilles tendon from the heel spur, the tendon of the quadriceps muscle of the thigh from the heel spur of the ligament of the ankle joint of the knee joint. A torn tendon causes immediate destruction of the muscle in the affected area.

Inside a meniscus tear, the inner meniscus of the knee joint is often ruptured. It is accompanied by a rupture of the internal ligament. Such an injury is not immediately detected. After some time, there are signs of blockage of the joint. Fluid accumulates in the joint cavity. Flexion contracture is observed. Going down the stairs, complains of difficulties with movement. When you try to grab the joint, you will feel pain. The pain gets worse when you twist your calf. The thigh muscles become thick. To clarify the diagnosis, arthropneumography, contrast radiography, and arthroscopy are performed.

Treatment of sprains and tears: anesthesia, applying a compression bandage, immobilization of the affected limb, local cold pressing. When the ligaments of the joint are stretched, a plaster cast is applied for up to 8-12 days. With prolonged application, physiotherapy is prescribed. Suturing the tentacle tear is performed only if the muscle function is impaired. If the muscle is completely torn, the tendon is surgically sewn up, immobilized for 3-6 weeks, after which massage and physical therapy are prescribed.

I. dislocation of the joint.

- the concept of joint dislocation.
- classification.
- clinical signs.
- treatment.
- first aid.

II. broken bones.

- the concept of a bone fracture.
- classification.
- first aid.
- features of immobilization.
- types of treatment provided.

III. stages of bone abrasion formation.

Plan.

Dislocation of the joint-dislocation of the joint-a rupture of the head of the joint, accompanied by ligament-capsule damage to the joint and impaired foot function.

Classification of joint dislocation:

I. Depending on the time limit:


new exit (injury duration is less than 3 days),

non-beginners (injury duration up to 14 days),

Senile dislocation - the duration of the injury is more than 2-3 weeks.

Open and closed exits.

Full and incomplete output.

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II. congenital protrusions.

III. incomplete output.

IV. full output.

- Paralytic;
- Pathological.
- As usual.
- Traumatic.
- Indirect.
- Complicated

Congenital dislocations occur due to a violation of the intrauterine development of the elements of the uterus. From the first days in the active movement

there is persistent lameness or absence of the musculoskeletal system of the affected limb. Multiple parts can be damaged sequentially when the damage is symmetrical. This is a very rare pathology. It may or may not be complete. Go out in relation to the ketophysiological norm of abnormally located organs or the pathological state of its part Incomplete exit Frequent joint ejection, in which the surface skew remains. The type of protrusion that occurs most often is non-traumatic.

In practical terms, the hip joint is observed in dysplasia, special orthopedic is detected in tests (Bardens and Ortolani), and the hip joint is visible on an X-ray.

Complete exposure of the surface, its types:

- Paralytic dislocations-pathological dislocations, dislocations of the limbs occur as a result of muscle paralysis.
- Pathological dislocation-dislocation due to joint diseases, which leads to the destruction of the articular surfaces of bones.
- Dislocation, as usual-anatomical features of the articular heads of bones changes in the connecting apparatus and link and one joint, based on the weakness of the surrounding muscles regularly recurring departures.
- Traumatic ejection-an exit is connected to external mechanical influences.
- Irreparable dislocation-soft between the bones complicated interposition of tissues, as well as aging care.
- Complicated dislocations-internal and articular with fractures, stem vessels and nerve plexuses due to complications associated with cortical damage.

Clinical picture.

As a rule, the symptom of dislocation of the bones of the extremities the ability to limp and support is completely eliminated, the disease begins, the restriction of movement in the affected joint;

Protrusion of the lower jaw-difficulties with food intake and limited passage of food, mismatch of teeth;

Dislocation of the vertebrae (depending on the degree of curvature of the vertebrae – lameness, cuts and paralysis, damage to the affected area during palpation, a painful sensation occurs.

If you are in doubt, take the following steps:

For help, you need to quickly contact a medical institution. The joint should not move. Fix the damaged wound with a splint until medical attention is provided. Selflessly don't try to move it or fix it. It is the joint and the surrounding muscles, ligaments, nerves, and blood that cause vascular damage. Ice is placed in the affected joint. This occurs due to internal bleeding and reduces the accumulation of fluid inside the joint and in the surrounding tissues. helps with absences. Bone Fractures-Bone fractures Bone fracturecrackage of whole bones or a major school disorder.Criticism

after harakat, with various diseases as a result, so catarrh suyek ie, IE, IE, IE, IE develops.


Classification.

I. Depending on the reason:

Traumatic-caused by external influence

Pathoanatomic-some pathology in the bones during processes (for example, tuberculosis, tumors, etc.)

II. depending on the severity of the damage:

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Complete: - unmixed (without mixing), for example, bone under the mouth; - continuous growth of fractures  
 Incomplete-cracks and fractures

IV. due to complications:

Complicated by: - traumatic shock; - damage to internal organs  
 with a lesion; - bleeding; - fat embolism; peptic ulcer infection, osteomyelitis, sepsis.

Not complicated.

Clinic.

Common symptoms:

shock, bleeding, fat embolism, prolonged spasms syndrome;

Local symptoms:

soreness, deformity, impaired limb function disorders and contractions, abnormal mobility, fractures of the  
 ends of bones crepitation.

Clinic.

Severity of the patient's condition and damage. If there is any bleeding, stop. Before the arrival of specialized  
 medical personnel, determine the possibility of replacing the patient. The patient will not be moved in the  
 presence of an intervertebral disc. With an isolated injury, the affected area is immobilized, wearing tires. Tire-  
 any object that can stop movement in the damaged area can be. Contraindications to transportation  
 transportation of the patient to a medical facility. If medical workers are in a state of alcoholic intoxication  
 and replace the patient in the presence of contraindications, the damage completely immobilizes the affected  
 area, after which the Catt is removed.

uses media.

First aid.

First aid is provided in the same place, as well as in the emergency room, or it can be done in a hospital. In  
 this case, the patient must assess the severity of the condition, prevent or treat it.

to alleviate traumatic complications, it is necessary to determine the scope of postoperative treatment.

Doctor's tactics. If the doctor indicates that the victim has a fracture, he acts as follows: Assessment of the  
 severity of the victim's condition. If Tusa's asks fight the most life-threatening ones first. Common  
 complications include shock and bleeding. Performs differential diagnosis of a traumatic fracture - I do not  
 know what it is.

If the diagnosis is clinically proven, immobilization is performed on the affected area at the upper level. After  
 the victim is immobilized, admission to a hospital or outpatient treatment makes a decision about the need  
 to make universal medical care. Highly specialized medical care is especially necessary for fractures of  
 complex parts, for fractures of bones when it is difficult to maintain in the right conditions or in the absence  
 of methods. Methods of treatment of fractures, both conservative and operative  
 when using X-ray monitoring every 5-7 days, i.e.-it is necessary to evaluate the effect of reposition and  
 regeneration. Treatment of fractures includes the following measures:

Anesthesia and anesthesia.

Soreness is a sign of a lesion, but, as you know, if the development of a defect is noticed, it becomes  
 dangerous. For this reason, any injury, as well as fractures, is also a disease

it is necessary to monitor the intensity of your feelings. Transport (temporary) address to the human limbs,  
 compliance with the following rules during immobilization should: leave the limb in a post-traumatic state,  
 it is desirable that you do not need to put the bone in its place.


At least 2 joints (below or above the fracture) should be fixed. In case of fractures of the iliac and humerus  
 bones, 3 fixes the joint. Wound treatment when applying a splint and in the presence of a wound  
 we must also stop the bloodshed.

Treatment.

Conservative treatment.

We classify conservative treatment methods into 3 groups:

Immobilization methods:

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Immobilization (fixed)- gypsum after a closed reposition of bandages (or polymer analogues) or for fractures without displacement.

Applying a bandage-a bone placed under an immobilization bandage excavation of cracks on the protrusions after treatment with an antiseptic solution, a piece of cotton or fabric is inserted to avoid being born. Then a plaster leg and arm splint or its polymer counterpart and circulation bandaging is performed. The following rules are followed: the legs and arms are in the most physiologically comfortable position.

The same bandage must include 2 joints-one distal from the fracture, the other the proximal one.

Б The bandage again does not twist, quacks.

Dist The distal areas of the foot and hand (fingertips) remain open forever. The last point is very important. Soft tissue tumor after applying a bandage symptoms characteristic of a tumor in the distal parts of the foot and lower leg if observed, cutting the bandage lengthwise to stop the development of trophic changes is necessary.

Treatment.

Traction methods. Main article: track Application of several types of stretching under load-skeletal, rare earth, adhesive, adhesive. The purpose of traction consists in bone fractures that neutralize the action of muscle plates and provide them from one to another with adequate regeneration of bone tissue, preventing its displacement, while at the same time constructing stretch marks that create conditions. Skeletal sprains-bone in optimal conditions for regeneration, the weight that ensures the capture of fragments is attached to the spoke passing through the bone by traction method. For example, in a knee fracture, the spoke passes through the plantar bone. Ileum fracture-performed through the bulge of the temporal bone.

Other methods of stretching under load have a skeletal effect compared to stretching downwards. Therefore, they are used for small bone fractures. The principles of all traction methods are the same: adequate stretching the load is attached to the distal part of the affected area to ensure safety. Its weight depends on the bone that will be used for traction. Types of stretching under load differ in the property of fixing the mutual load. Functional methods. Functional-without immobilization of the affected segment or treatment with minimal immobilization. Rarely used-small for broken bones or ruptured tubular bone.

Treatment.

Surgical treatment.

Closed reposition and percutaneous metallosteosynthesis. Through the skin, fixation of bone fractures using a conducted spoke or plate. Azinvasive metallosteosynthesis. In the bone that is located under the skin fixation of bone fractures using a plate that is attached with a screw.

An open reposition. Bone fractures during surgery . Manual reposition of bone fragments with subsequent fixation with pins Violation of the integrity of the bone is called a fracture. It is a mechanical force caused by growth and characterized by soft tissue damage. Close-up and there are types of horses. In open fractures, a wound is formed at the site of the fracture. This is very dangerous, because the risk of wound infection is high. If there is a fracture, if it is cracked, then this is:

1) Closed (in peacetime-without skin damage);

2) complete (violation of part of the entire integrity of the bone), incomplete (bone breakage of a certain part of the rod) is divided into In addition to serious changes in the affected bone itself, it is surrounding soft tissues (skin, muscles, joint nerves) they also change. can be exposed.

Symptoms of a fracture:

- severe pain in the area of the fracture (urgent, pain in the same area);


- violation of the functions of the legs and arms - with a complete fracture, it is clear and complete

With a non-fracture, a puncture or fracture of one of the bones of the limb occurs. not so well known at the time;

- shortening of the bones of the legs and arms (during examination or measurement);

changes in the shape of the limb bones (deformity-bending);

presence of abnormal movements in the affected area (when stroking);

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sometimes creaking or creaking of the bones (the friction of the fracture is felt or can be heard); sometimes fever (up to  $-38^{\circ}\text{C}$  in the first days);

With a fracture of the skull, ribs, spine and pelvic bones, the head and signs of infection of the spinal cord, lungs, bladder, rectum, etc. are determined. Types of fractures and their complications.

Complete types of fractures: transverse fracture line-transverse to the length of the bone (tubular in the bones, short bones - femur, calf, foot bones, ankle, heel bone, etc.);

oblique fracture line-transverse to the length of the bone (often found in long bones of the arm and leg).

longitudinal fracture line-parallel to the length of the bone (usually in the finger bones). or on the articular ends of long bones of the legs and arms);

line — in the form of a spiral line (when twisting long bones-mainly in the legs, shoulder bones).

5) mixed fracture (some lines are T-shaped, S-shaped, or wedge-shaped).

etc. b.) line. Mainly an internal bone fracture around the joint;

6) punctured bone fracture – penetrates into another bone ("punctured"). Bone

Violations of integrity are individualized in number, numerous, vivid.(three or more bone fractures, more often with gunshot wounds).

With a fracture, the position of bone fragments may change (muscle contraction of the bone fragment stuck to the bone), the development of infection (soft tissue suppuration, the development of a purulent-necrotic process in the damaged bone – a bullet hit wound osteomyelitis).

Children often have special fractures — fractures and bone humps.

Fractures on the bone surface with a slight subsurface movement, epiphysis, bone

fracture in the area of non-ossified epiphyseal cartilage at the ends. In case of fractures, the victim should be kept completely still. This shock Reduces the causes of soft tissue and bone formation. shrapnel damage must be prevented. If the fractures are open, first stop the bleeding and bandage the wound. Clothes and shoes will be removed or sewn up

Mechanism of joint dislocation

A dislocation is a dislocation of the articular bones. The joint may be completely or partially dislocated. Usually, two bones meet and face each other in the joint pocket. Sometimes a child's joint can be born from the inside, go outside due to injuries and various diseases in everyday life. Joint loss is common in the hip, shoulder, and elbow joints. This is due to incomplete growth of the pelvis and testicular joint, and the most common type of dislocation is an accidental injury. When a joint is dislocated, the surrounding tendons, pockets, skin at the junction of the bone can be damaged, and even the bone is broken. This can damage not only the bone, but also the blood vessels and nerve fibers located near the joint. Pathological protrusion of the joint occurs due to various joint diseases (arthritis, polyarthritis, nerve diseases). A dislocated joint should only be treated by a specialist doctor. The dislocated joint should be put back in place and tied with a bandage. A joint that has not been treated and replaced in time is called an obsolete joint. Such a joint can only be restored surgically.

Classification: complete and incomplete, new and old, closed and open, congenital and acquired (as a result of injury or disease) depending on the position of the head of the bone: anterior, lower, posterior. If the selection is repeated at least 2 times, then they are called habitual.

Diagnostic criteria:

1. Flattening of the deltoid muscle relief.
2. Pronounced protrusion of the humerus, pulling the tissues under it inward.
3. Restriction of active movements.
4. Elasticity.
5. When the shoulder joint is shortened, neurological symptoms are detected.

Laboratory tests: none.

Instrumental studies: the diagnosis is confirmed by X-ray in direct, lateral and axial projections. It is necessary to separate the output from the scrap.

Indications for specialist consultation: due to a double pathology.

Differential diagnosis: none.

List of basic diagnostic measures: none.

List of additional diagnostic measures: none.

Treatment tactics

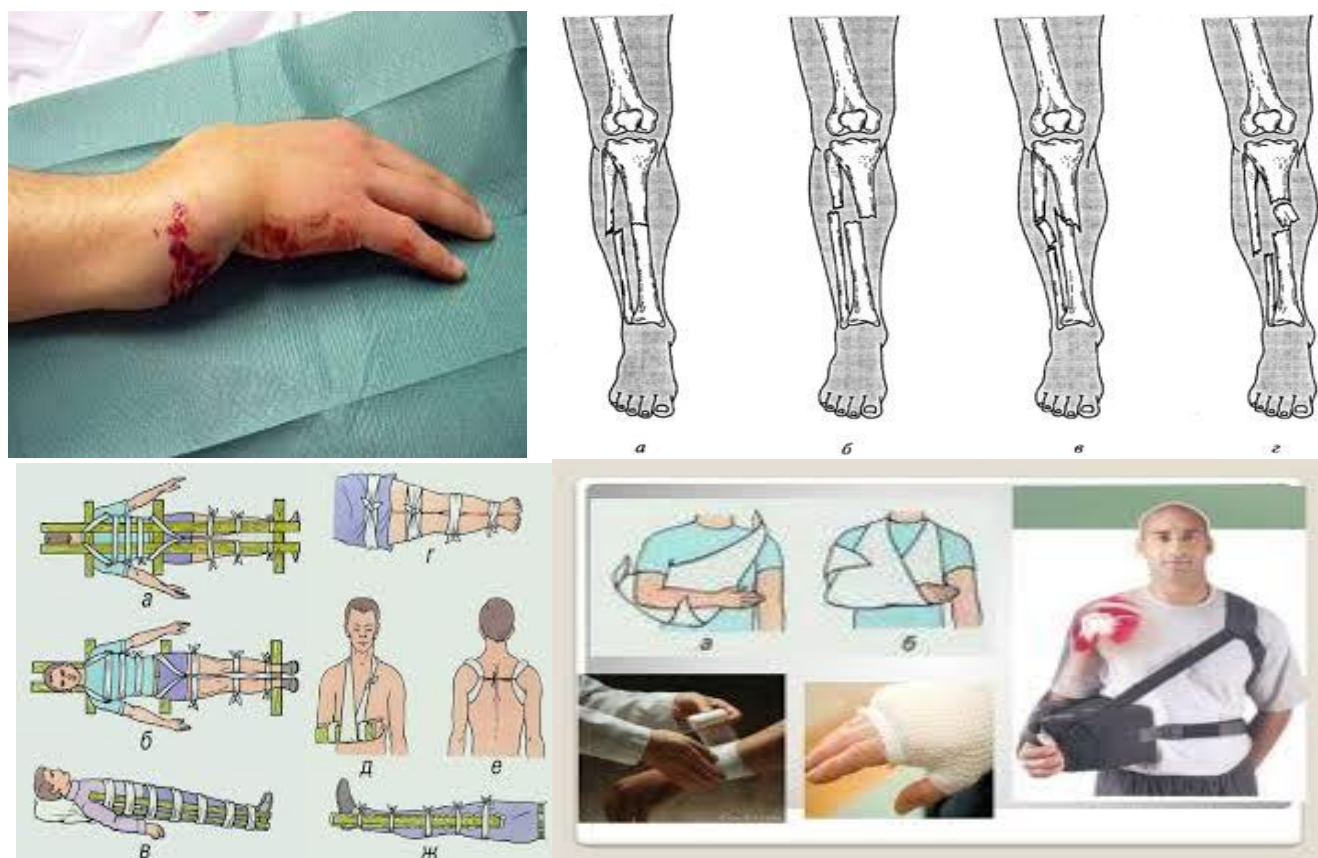
The goal of treatment: to put the slipped bone in place, eliminate the feeling of pain. If the patient can place the cuff of the affected arm on the opposite shoulder, then the hip joint is positioned correctly.

Medical treatment: none.

Medical treatment:

After general anesthesia or intravenous administration of pethidine, position the anterior cruciate ligament in one of the following ways:

#### 4. Illustrative material:



#### 5. References:

- Durmanov, K. D. Zhalpa surgery: okulyk / .- Karaganda: AKNUR, 2017. - 608 bet. S
- Gostischev V.K. General surgery: textbook and CD.– 4th ed. – M., 2016. – 832 p.;

#### 6. Security questions (feedback)

1. Fundamentals of traumatology. Classification. The concept of industrial, agricultural, domestic, street, sports, and military injuries.
2. Organization of first aid.
3. Closed damages.
4. Soft tissue injuries
5. Dislocations.
6. Bone fractures. Classification.