


MINISTRY OF HEALTH OF UKRAINE
ODESA NATIONAL MEDICAL UNIVERSITY

Faculty Medical №1
Department of simulation medical technologies

CONFIRMED by
Vice-rector for scientific and pedagogical work
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**METHODICAL RECOMENDATION
FOR ACADEMIC DISCIPLINE**

«NURSING PRACTICE. SIMULATION TRAINING»

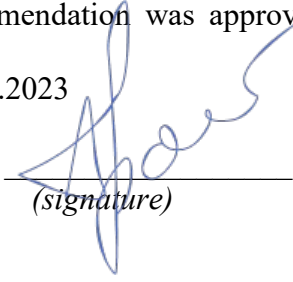
Faculty, course: Medical, 3 year

Educational Discipline: Nursing practice. Simulation training

Approved:

The methodical recommendation was approved at the meeting of the department of simulation medical technologies
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Head of the department



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Practical lesson No. 1

SUBJECT: HEMOSTASIS. BLEEDING AND BLOOD LOSS. BLOOD TRANSFUSION AND BLOOD SUBSTITUTES.

Purpose: Mastering the basic practical skills in providing assistance to patients with bleeding. Familiarization with methods of blood transfusion and its components.

A student of higher education must:

- to know: types of bleeding, methods of stopping bleeding, methods of determining blood group and Rh factor.
- to be able to: apply in practice theoretical knowledge on determining the blood group and Rh factor, stop bleeding of various types with special and improvised means.

Basic concepts: hemostasis, bleeding, blood loss, blood group, Rhesus factor, blood transfusion and blood substitutes.

Plan:

1. Organizational measures: greetings, verification of those present, announcement of the topic, purpose of the lesson, motivation of higher education seekers to study the topic.
2. Control of the reference level of knowledge: a frontal survey of applicants for higher education with the aim of determining the level of theoretical readiness of applicants to perform practical classes:
 - determination of blood group;
 - determination of the Rhesus factor;
 - determining the compatibility of the blood of the donor and the recipient;
 - stop bleeding in different ways.
3. Formation of professional skills.

Content of tasks:

Mastering the skills of identifying types of bleeding and providing assistance for various types of bleeding; analysis of blood group and Rh factor, determination of compatibility and suitability of blood.

Recommendations (instructions) for performing tasks.

Hemostasis is a protective reaction of the body, thanks to which bleeding stops when a vessel is damaged. In surgery, the term "hemostasis" refers to mechanical and medicinal means of stopping bleeding.

First, you need to determine the classification of bleeding:

1. Anatomical (according to the type of damaged vessel)
 - Arterial: blood flows out quickly, under pressure, bright red in color (it can be dark in case of asphyxiation or poisoning). The speed is high, the volume of blood loss is determined by the nature of the damage and the caliber of the vessel.
 - Venous: blood is dark in color and flows slowly.
 - Mixed: arterial-venous.
 - Capillary: individual bleeding vessels are not visible, blood flows over the entire surface (dangerous in hemophilia).
 - Parenchymatous: from internal parenchymal organs. It is usually abundant and very dangerous because the blood vessels are tightly connected to the connective tissue of the organ and do not fall off. It rarely stops on its own.
2. According to the mechanism of occurrence.
 - Erosive: In purulent processes and the disintegration of tumors, when the vessel wall is destroyed.
 - Diapedesis: when vascular permeability is impaired (vitaminosis C, sepsis, scarlet fever, uremia, etc.).

- When a vessel is damaged.
 - In case of blood coagulation disorders.
3. Regarding the external environment.
- External: quickly diagnosed.
 - Internal: blood flows into the lumen of hollow organs, tissues, cavities. Internal are divided into explicit and hidden. Hidden - hemoperitoneum, hemothorax, hemarthrosis, hemopericardium. Obvious - vomiting of "coffee grounds", melena, bleeding from the biliary tract, kidneys and urinary tract.
4. By the time of occurrence.
- Primary: associated with trauma.
 - Secondary: early – from several hours to 4-5 days after the injury and late.
5. According to the course
- Sharp.
 - Chronic.
6. According to the severity of blood loss.
- Light - loss of BCC 10-20% (500-1000 ml)
 - Average - loss of BCC 20-30% (1000-1400 ml)
 - Severe - loss of BCC 30-40% (1500-2000 ml)
7. By clinical manifestation and localization.

Hemoptysis - hemoptysis; bloody vomiting - hematemesis; uterine bleeding - metrorrhagia, bleeding into the urinary system - hematuria; bleeding into the abdominal cavity - hemoperitoneum; in the lumen of the gastrointestinal tract - melena; nosebleeds - epistaxis.

General symptoms of bleeding.

Subjective: complaints of weakness, dizziness, darkening of the eyes, feeling of lack of air, nausea, anxiety.

Objective: paleness of the skin, cold sweat, cyanosis, tachycardia, thread-like pulse, shortness of breath, decrease in blood pressure, decrease in diuresis, impaired consciousness.

To assess the severity of a patient with acute blood loss, it is possible to use the scheme of degrees of severity of blood loss according to O.O. Shalimov

1st degree, easy. Loss of up to 20% of BCC. The general condition of the patient is satisfactory or moderate. The skin is pale. Pulse 90-100 bpm. Blood pressure 100-90/60 mmHg. Oliguria.

2nd degree, medium severity. Loss of 20-30% of BCC. The general condition is moderate. The skin is pale. Pulse 120=130 bpm, weak filling. Blood pressure 90-80/50 mmHg. Sticky sweat, shallow, accelerated breathing. Pronounced oliguria.

3rd degree, severe. Loss of more than 30% of BCC. The general condition is severe or extremely severe, loss of consciousness. Suppression of muscle reflexes. The skin is pale-cyanotic, the pulse is 130-140 bpm, thread-like, it may not be determined on the peripheral arteries. Blood pressure 0-60 mm Hg. Breathing is superficial, rare. Anury.

A loss of 50-60% of BCC causes cardiac arrest due to insufficient blood supply to the myocardium.

Means to stop bleeding depend on the previously mentioned factors.

A patient with acute bleeding always needs urgent care.

Stopping bleeding can be temporary or permanent.

Temporary is emergency care, the purpose of which is to save life and enable transportation to a medical facility.

Ways to temporarily stop bleeding:

- elevated limb position;
- applying a compression bandage;
- tight wound tamponade;
- finger pressure of the vessel in the wound along its length;
- temporary vessel shunting;
- application of a harness or tourniquet.

In case of capillary and minor venous bleeding, an elevated position of the limb is used, which reduces its blood supply. A bandage is applied to the wound.

A compression bandage is applied in case of capillary or venous bleeding (more often in the case of

head and limb injuries). Small vessels are quickly thrombosed due to compression.

Tight tamponade is used for deep wounds, bleeding from the nose, vagina, and rectum.

When an artery is injured, finger pressure is applied to the vessel along its length. This technique is used either before applying a tourniquet, or if a quick final stop of bleeding is possible. Finger pressing is applied above the site of injury, pressing against the bones:

1. The temporal artery is pressed with one finger to the temporal bone in front of the auricle 1-1.5 cm from it.
2. Carotid artery - below the injury to the cervical vertebrae.
3. Subclavian artery - to the first rib in the fossa above the clavicle.
4. Inguinal artery - to the head of the humerus.
5. Brachial artery - pressed against the humerus from the inside of the shoulder on the side of the biceps muscle.
6. Ulnar artery - in the area of the ulnar fossa.
7. Radial artery - to the underlying bone in the area of the wrist of the thumb
8. Femoral artery - in the inguinal area to the pubic bone of the pelvis with a fist.
9. Popliteal artery - in the region of the popliteal fossa.
10. Abdominally - with a fist to the spine to the left of the navel.

A more reliable way to stop bleeding is ligation of blood vessels in the wound. To do this, find the central and peripheral end of the vessel, grab them with hemostatic clamps and tie them.

If it is impossible to find the ends of the bleeding vessel, as well as in case of secondary bleeding, vascular ligation is used throughout.

Selection of tools for vascular ligation surgery.

1. Rubber catheters, tubes, drains.
2. Syringes with needles.
3. Surgical instruments (forceps, probes, scissors, forceps, clamps, scalpels, needles, needle holders, wound expander
4. Auxiliary containers (kidney-shaped and rectangular trays)
5. Bandage material (large and small napkins, tampons, cotton and gauze balls, tourniquets).

1. Towels.
2. Shorts equipped with the above material.
3. Box with clothes for medical personnel.
4. Disinfectant solutions.

A tourniquet is applied in case of arterial bleeding, above the wound, it is not possible to apply a tourniquet in case of venous bleeding! The tourniquet is not applied in places where there are two bones (forearm, lower leg);

- before applying the tourniquet, the patient is given a comfortable position, a the skin is protected by a layer of clothing or other fabric

(bandage, towel, gauze, etc.);

- the tourniquet is located on the outside of the limb, facing towards face of the victim;

- the tourniquet is raised from the inner side of the limb, stretched from holding the middle with one hand, the end with the other. Stretched wrap the limb with a tourniquet, tightening the first round until the bleeding stops;

- subsequent rounds of the harness (3-4) are applied with less tension, but not allowing relaxation of the first round;

- each subsequent tour of the harness should overlap the previous one by 1/3 width in order to prevent pinching of the skin and its necrosis;

- the ends of the harness are fixed;

- the correctness of applying the tourniquet is assessed: stopping bleeding from the wound, absence of pulsation of arterial vessels distal to the site

applying a tourniquet, the appearance of a characteristic marble pallor and cooling of the skin;

- an aseptic dressing is applied to the wound and transportation is carried out

immobilization of the affected limb segment;

- under the harness, in a prominent place, a note with

the specified time of the last overlap;

- the tourniquet can remain on the limb for no longer than 2 hours. If during this time it is not possible to carry out a final stop of bleeding, then for the purpose of recovery of collateral blood circulation in tissues every hour (and in winter

time - every 30 minutes) the tourniquet is removed, the artery is pressed with a finger (in the wound or during) and after 3-5 minutes apply the tourniquet again;

- if necessary, hemostasis with the help of a tourniquet for more than 2 hours, after during the next relaxation, it is placed slightly higher than the previous one places

A modern tourniquet is even easier to apply. Handy tools (belt, handkerchief, suspenders, etc.) can be used as a harness.

In the case of prolonged bleeding and lack of stabilization of hemodynamics, it is necessary to start transfusion of blood or its components.

Blood transfusion, or hemotransfusion, is an operation that involves the transfer of blood or blood components from a donor to a recipient. The goal is to replace lost components and restore blood functions. Transfusion can be direct (currently not used) and indirect. In Ukraine, several studies are required for blood transfusion:

- Macroscopic assessment of benign blood quality;

- Determination of blood group and Rh factor;

- Determination of individual and Rh compatibility.

Macroscopic assessment of the benign quality of blood.:

1. Container tightness

1. Passporting - number of transfusion medium, date of collection and expiration date, blood group and Rhesus affiliation, name of preservative, name of procurement institution, full name of donor, data on RW, HBs-Ag, HCV, HIV -1,2 control.

2. The blood should be divided into 3 layers (bottom – red erythrocytes, middle layer – a narrow gray band of leukocytes and platelets, top – yellow transparent plasma). Plasma should be transparent without films and flakes (infected blood), clots, red color (hemolysis). If at least one of the presented requirements is not met, such blood cannot be transfused!

Macroscopic evaluation of the benignity of the erythrocyte mass.

Erythrocyte mass should be:

1. cherry-colored, uniform structure, with no clots in globular mass;

2. a clear boundary between the globular mass and plasma;

3. the supernatant should be transparent, without turbidity, flakes, streaks of fibrin, pronounced hemolysis.

4. Visually determine the integrity of the bottle or plastic bag, procurement and storage period, correctness of passporting.

Macroscopic evaluation of the quality of fresh frozen plasma after thawing.

1. Check the integrity and tightness of the package.

2. Frozen plasma is thawed at a temperature not higher than 35-37°C, with constant temperature maintenance.

3. After the defrosting procedure, it should not be visually determined undissolved cryoprecipitate.

4. Thawed plasma should have a uniform consistency of yellow straw color.

5. Re-freezing of plasma is not allowed.

Macroscopic assessment of benignity native plasma.

1. Native plasma should be: straw-yellow,

greenish-yellow color, transparent without flakes, fibrin streaks and clots; turbidity or the appearance of a so-called greasy film on its surface often is associated with the presence of a large amount of neutral fat in it (yes called chylous blood) to distinguish chylous plasma from bacterial plasma contaminated, the bottle should be placed for 30 minutes. into warm water or a thermostat at a temperature of 37 °C. Under these conditions, the chylous film disappears, the plasma brightens;

2. Visually determine the integrity of the bottle or plastic bag, procurement and storage period, correctness of passporting.

Macroscopic evaluation of the benign quality of dry plasma.

1. Dissolved dry plasma is usually translucent with opalescence yellowish liquid.

2. It should not contain sediment, flakes, clots or any other insoluble particles.

3. Dry plasma is dissolved immediately before transfusion and used plasma should be immediately after reconstitution.

Dissolution is carried out in strict compliance with the rules of asepsis.

4. Visually assess the integrity of the bottle, the period of procurement and storage, correctness of passporting.

Determination of blood group.

1. Determination of blood group using standard serums.

- Put the inscriptions of blood groups on a clean white plate from above: on the left O(I), in the middle A(II) and on the right B(III).

- Apply 1 drop (0.1 ml) of standard serums of the corresponding groups, two series, separately under each inscription.

- Using a separate glass stick, apply a drop (0.01 ml) of the tested blood to the plate next to the serum (in a ratio of 1:10). 7. Mix each drop of blood and serum together with a separate glass stick. Periodically shake the plate slightly.

- In 3 minutes. add 1 drop of 0.9% NaCl solution to the drop where agglutination occurred.

- Continue observation while rocking the plate for up to 5 minutes.

- When determining the AB(IV) blood group, it is necessary to conduct a control study of these erythrocytes with serum of the AB(IV) group. Confirmation of belonging to this group is the absence of agglutination.

2. Determination of blood group by standard erythrocytes.

- 3 drops of serum of the examined person (0.1 ml) are applied to the marked plate, 0.01 ml of standard erythrocytes of O(I), A(II), B(III) blood groups are added to each drop.

- Mix each drop of serum and standard erythrocytes together with a separate stick. Periodically shake the plate slightly.

- In 3 minutes. add 1 drop of 0.9% NaCl solution to the drop where agglutination occurred.

- Continue observation while rocking the plate for up to 5 minutes.

3. Determination of blood group using monoclonal reagents anti-A and anti- - Place the inscriptions anti-A, anti-B and anti AB on a clean white plate from above.

anti-B and anti-AB.

- Apply one drop (50 µl) of blood to be tested next to the reagent drops.

- Mix a drop of blood and reagent with a separate glass rod.

- Observe the progress of the reaction by gently shaking the plate for 5 minutes.

4. Determination of individual blood compatibility of the donor and the recipient.

-Centrifuge blood (or refrigerate for 12 hours to settle) to obtain serum.

- Pipette a large drop (0.1 ml) of the patient's serum onto the plate.

- Apply a small (0.01ml) drop of donor blood next to a drop of the recipient's serum and mix.

- Observe the reaction for 5 minutes, shaking the plate.

- Centrifuge the blood (or refrigerate for 12 hours to settle) to obtain serum.

- Pipette a large drop (0.1 ml) of the recipient's serum and next to it a small drop (0.01 ml) of the

donor's blood.

- Mix the donor's blood with the patient's serum. 5. Place the Petri dish in a water bath at a temperature of 44-48°C

Control materials for the final stage of the lesson:

Situational task No. 1.

A 25-year-old man with a gunshot wound to the right lower leg. What are your actions to help?

Situational task No. 2

A 5-year-old child needs a blood transfusion. What are your steps to determine the blood group and Rh factor?

Questions for current control:

1. Classification by bleeding?
2. Assessment of the severity of the patient's condition with bleeding?
3. Types of stopping bleeding?
4. Methods of determining blood groups?
5. Methods of determining the Rhesus factor?
6. Methods of determining suitability of blood for transfusion?

4. Summary:

Current evaluation criteria in practical training

Rating	Evaluation criteria
Perfectly "5"	The applicant is fluent in the material, takes an active part in discussing and solving the situational clinical problem, confidently demonstrates practical skills during the examination of the patient simulator. Expresses his opinion on the topic of the lesson, demonstrates clinical thinking.
Fine "4"	The winner has a good command of the material, participates in the discussion and solution of a situational clinical problem, demonstrates practical skills during the examination of a patient simulator with some errors, expresses his opinion on the subject of the lesson, demonstrates clinical thinking.
Satisfactorily "3"	The acquirer does not have sufficient knowledge of the material, is unsure of participating in the discussion and solution of the situational clinical problem, demonstrates practical skills during the examination of the patient simulator with significant errors.
Unsatisfactorily "2"	The acquirer does not possess the material, does not participate in the discussion and solution of the situational clinical problem, does not demonstrate practical skills during the examination of the patient simulator.

1. List of recommended literature:

Main:

1. Emergencies in the practice of a therapist and family doctor / under the editorship Yepishyna A.V. – ISBN: 978-966-673-122-0. Ukrmedknyga 2019p. 380 pages .
2. Mechanical Ventilation in Emergency Medicine . by Susan R. Wilcox & Ani Aydin & Evie G. Marcolini . ISBN 978-3-319-98409-4 ISBN 978-3-319-98410-0 (eBook).
<https://doi.org/10.1007/978-3-319-98410-0/2019> . 122 pages
3. Acute Medicine : A Practical Guide that the Management of Medical Emergencies , 5th Edition / David C. Sprigings (Editor), John B. Chambers (Editor) - ISBN: 978-1-118-

Additional:

1. The Complete First Aid Pocket Guide . by John Furst / ISBN 9781507208892 - Adams Media , 2018. 190 pages
2. Manual of emergency medicine / editor , G. Richard Brian . — 6th ed . ISBN: 978-1-60831-249-8. May 23, 2011. 704 pages

Electronic information resources:

1. <https://zakon.rada.gov.ua/laws/show/z0356-22#n42>
2. https://courses.prometheus.org.ua/courses/NMU/Cardiology101/2017_T1/course/
3. <https://emergencymanual.stanford.edu/downloads/>
4. <https://www.coursera.org/learn/infarction>
5. <https://www.coursera.org/learn/managing-asthma-allergies-diabetes-and-seizures-in-school>
6. <https://www.futurelearn.com/courses/critical-care>
7. <https://www.medscape.org/viewarticle/964673>
8. <https://www.medscape.org/viewarticle/964201>
9. <https://www.medscape.org/viewarticle/965140>

Practical lesson No. 2

SUBJECT: INJURY AND INJURY. DESMURGIA. SURGICAL INFECTION.

Purpose: Mastering the basic practical skills for providing assistance to patients with various types of injuries, functional duties of a nurse of a surgical and traumatological profile, prevention of complications in injuries and surgical pathology.

A student of higher education must:

- to know: rights and responsibilities of medical personnel, theoretical aspects of primary surgical treatment, types of dressings and splints, a list of tools for performing venesection, tracheostomy, pleural puncture, laparocentesis, application and removal of skin sutures, treatment of various types of wounds.
- be able to:
- transport victims with various types of injuries;
- apply bandages and splints;
- carry out processing of hands and the operating field;
- make a set of tools for carrying out: venesection, tracheotomy, pleural puncture, laparocentesis;
- clean surgical and purulent wounds;
- treat necrotized and ulcerated areas of soft tissues

Basic concepts: injuries, wounds, venesection, tracheostomy, pleural puncture, laparocentesis, surgical infection.

Plan:

1. Organizational activities: greetings, verification of those present, notification of the topic, the purpose of the lesson, motivation of higher education seekers to study the topic.
2. Control of the reference level of knowledge: a frontal survey of applicants for higher education with the aim of determining the level of theoretical readiness of applicants to perform practical classes:

- - fractures of the pelvis, spine, femur, ribs;
- - types of immobilization;
- - surgical infection.

3. Formation of professional skills and abilities.

Content of tasks:

- application of various types of bandages and splints;
- transportation of a patient with various types of fractures;
- surgical treatment of hands, operating field and various types of wounds.

Recommendations (instructions) for performing tasks.

To the duties of a nurse in the surgical department includes care of the operation site (bandage, drainage)⁶, urination, bowel movements. The nurse performs all the doctor's appointments during the shift, measures body temperature, collects secretions for analysis

the patient (analysis of urine, feces, sputum, etc.), prepares the patient for surgery. The day before, he puts on an enema (in the evening and in the morning), treats the skin, prevents bedsores, fills out medical documentation.

Operating nurse.

Her functional responsibilities differ from those of a post nurse. First of all, her duties include preparation tools, suture, dressing material before the operation. Sterility should be strictly observed during the operation.

The operating nurse is entrusted with personal responsibility for violation of asepsis during the operation and occurrence in the post-various complications during the operative period: suppuration of surgical wounds, etc. The operating room nurse organizes the work of the operating room and manages the current, planned and general cleaning, dresses the surgeon in sterile clothes, provides instruments during the operation.

The duties of the operating room nurse include sending the operating material for histological examination.

Surgical infection is the general name of diseases and pathological processes of infectious origin, in the complex treatment of which surgical methods are of decisive importance.

To prevent complications associated with surgical infection, the following treatment methods must be carefully followed:

Hand processing methods:

- household level (mechanical processing). The goal is to remove most of the pathogenic microflora from the surface of the skin without using an antiseptic;
- hygienic level (hand treatment using a skin antiseptic)
- surgical level (a sequence of manipulations that ends with putting on sterile gloves). Surgical treatment consists of 3 stages.

1. Mechanical cleaning of hands;
2. Hand disinfection with a skin antiseptic;
3. Covering hands with sterile disposable gloves.

Surgical hand antiseptics by rubbing the product

- wash hands with detergent, rinse thoroughly;
- thoroughly dry hands with a disposable towel;
- pour with the help of a dispenser (press the elbow on the lever).

an antiseptic agent in the hollow of a dry palm;

- first of all, wet the hands with an antiseptic, then the forearms and the elbows;

- rub the antiseptic in separate portions over time, specified by the developer. At the same time, the hands should be held higher elbow bends;
 - do not use a towel after antiseptic treatment.
- Wait for the hands to dry completely. Wear gloves only on dry hands.

Standard method of processing hands antiseptic according to EN 1500:

- palm to palm, including the wrist;
- right palm on the left back of the hand and left palm on the right back of the hand;
- palm to palm with crossed fingers;
- the outer side of the fingers on the opposite palm with crossed fingers;
- ring-shaped rubbing of the left thumb in a closed position palms of the right hand and vice versa;
- circular rubbing of the closed fingertips of the right hand on the left palm and vice versa.

They are used under military field conditions and in emergency situations

methods based only on skin tanning: the group includes methods of treating hands with 96% alcohol, 1% solution of diamond green, etc. Their significant disadvantage is significant skin damage, allergic reactions.

Treatment of the operating field

Preliminary preparation of the place where the incision will be made - operational field, begins on the eve of the operation and includes the general hygienic bath, change of underwear, dry shaving directly at the point of operative access. After shaving the hair, the skin wipe with alcohol.

When processing the operating field directly in the operating room, it is worth adhere to the following principles:

- - processing should be much wider than the operative zone access;
- - processing sequence – from the center to the periphery;
- - multiplicity of processing during the operation (before the start and before suturing);
- the most polluted areas are treated last.

Before surgery on the operating table in the operating room the field is widely lubricated with a 5% alcohol solution of iodine. Direct location operations are isolated with sterile linen and lubricated again with 5% alcohol iodine solution. Before applying and after applying stitches on her skin treated with the same alcohol solution. This method is known as method Grossykh-Filonchikova. With increased sensitivity to iodine, the skin adult patients and children are treated with a 1% alcohol solution diamond green (Bakkala method)

A wound is a mechanical damage to the integrity of the skin or mucous membranes. Wounds are among the most frequent injuries, both in wartime and in peacetime.

Primary surgical treatment of the wound (PHO) is an operative intervention, the purpose of which is to remove from the wound cavity various foreign objects, debris, dirt, areas of dead tissue, blood clots and other elements that can lead to complications in the treatment process and increase the time recovery and restoration of damaged tissues.

Depending on the timing of the procedure, it is divided into:

- Early, if all treatment measures were carried out within the first day after the injury.
- Postponed, if the treatment is carried out within the second day after receiving injuries.
- Late, if it was possible to carry out the treatment only on the third day after receiving the injury or even later.

Of course, the ideal option is a situation where wound healing is performed immediately after receiving an injury and at the same time is a comprehensive treatment, but this is not always possible.

Algorithm of PHO wound:

1. The wound cavity is dissected by a linear incision. The length of such an incision should be sufficient for the doctor to perform all the work on the injury. The incision is made taking into account the topographical and anatomical features of the structure of the human body, i.e. in the direction along the nerve fibers, blood vessels, as well as Langer's skin lines. Layers of skin and tissues, fascia and subcutaneous tissue are dissected layer by layer so that the doctor can accurately determine the depth of the damage. Muscle dissection is always done along the fibers.
2. Removal of foreign bodies from the wound cavity. In the case of gunshot wounds, such an object is a bullet, in the case of a shrapnel wound, fragments of a projectile, in the case of knife and cut wounds, a cutting object. In addition, when receiving any injury, various small objects and garbage can get into it, which must also be removed. Simultaneously with the removal of various foreign bodies, doctors also remove dead areas of tissue, blood clots, pieces of clothing, and bone fragments if they are present. The entire contents of the existing wound channel will also be extracted, for which the method of washing the wound with a special device with a pulsating stream of an antiseptic solution is usually used.
3. Excision of tissues that have lost viability. At the same time, the entire area of primary necrosis is removed, as well as areas of secondary necrosis, that is, those tissues whose viability is doubtful. As a rule, the doctor evaluates tissues according to certain criteria. Viable tissue is characterized by a bright color and bleeding. Living muscles should respond by shortening the fibers when they are irritated with tweezers.
4. Performing an operation on damaged tissues and internal organs, for example, on the spinal cord and spine, on the brain and skull, on main vessels, organs of the abdomen, chest cavity or pelvis, on bones and tendons, on peripheral nerves.
5. Drainage of the wound, while the doctor creates the most possible optimal conditions for the normal outflow of the excrement. A drainage tube can be installed alone, but in some cases it is necessary to place several tubes in the damaged area at once. If the injury is complex and has several pockets, then each of them will be drained with a separate tube.
6. Closure of the wound depending on its type. The type of suture is chosen individually in each individual case, since part of the wounds must be sutured immediately after the treatment, and the other part is closed only a few days after the PHO.

A set of tools for venesection:

General tools

Korntsang - 2

Pins - 4

Syringe 10.0 – 1

Anatomical tweezers - 2

Tools for tissue dissection

Abdominal scalpel - 1

Sharp scalpel - 1

Sharp surgical scissors -1

Tools to stop bleeding

Kocher blood pressure clamps - 4-6

Billroth blood pressure clamps – 4-6

"Mosquito" type clamp - 2

Tools for tissue expansion

Farabef's hooks - 2

Sharp toothed hooks - 2

Tools for stitching fabrics

Cutting needles - 2

Barbed needles - 2

Gehar's needle holder - 1
Surgical tweezers - 2
Special tools
Deshaun's needles - 2
Silk ligatures
Intravenous catheter - 1
Silk ligatures
Intravenous catheter - 1

A set of tools for tracheostomy

General tools
Korntsang - 2
Pins - 4
Syringe 20.0 - 1
Anatomical tweezers - 2
Tools for tissue dissection
Abdominal scalpel - 1
Sharp scalpel - 1
Sharp scissors - 1
Tools to stop bleeding
Kocher blood pressure clamps - 4
Billroth blood pressure clamps - 2
"Mosquito" type clamp - 2
Tools for tissue expansion
Two-toothed sharp hooks - 2
Farabef's hooks - 2
Tools for stitching fabrics
Needle holder Hegar-2
Cutting needles - 4
Surgical tweezers - 2
Special tools
Different types of leather tracheostomy tube sizes - 4
Single tooth tracheostomy hooks - 2
Trousseau dilator of the trachea - 1
Thick rubber catheter - 1

A set of tools for laparocentesis:

General tools
Korntsang straight - 1
Syringe 20.0 - 1
Injection needles - 2
Surgical tweezers - 2
Tools for tissue expansion
Scalpel - 1
Sharp scissors - 1
Tools for stopping bleeding
Bleeding clamps - 4
Tools for sewing fabrics
Needle holder Hegar-2
Cutting needles - 4
Special tools
Trocar - 1
Wandering catheter - 1

Thoracocentesis

Indications for pleural puncture are: hemothorax – blood in the chest cavity, hydrothorax - fluid in the chest cavity, pneumothorax - air in the pleural cavity, pleural empyema - pus in pleural cavity
Position of the patient: sitting with an inclination forward, half-sitting in bed.

Analgesia: local - 0.25-0.5% novocaine solution.

Technique: The puncture site is chosen depending on the localization accumulation of liquid or air. It is used to define it physical, x-ray and ultrasound research methods. At accumulation of fluid in the free pleural cavity puncture is performed usually in the VII-VIII costal spaces of the corresponding side on the back armpit line. It is necessary to remember the position of the intercostal vessels.

It is necessary to puncture the pleura along the upper edge of the rib

With pneumothorax, especially tense, pleural puncture performed in the second intercostal space along the mid-clavicular line.

In case of chest injuries with lung damage and the presence of pneumo- and hemothorax, as an urgent measure, two punctures are performed: one - in VII-VIII rib spaces for liquid removal and the second - in

the second rib gap to remove air. In the future, these

punctures are replaced with drainage. Cool is used for pleural puncture cut needles with a diameter of 1.2-1.3 mm. On the pavilion, the needles fix the rubber or a polyvinyl chloride tube, which before the puncture is filled with a solution and squeezed with a Kocher or Billroth clamp. On the other end of the tube

there must be a cannula for connecting the syringe. There is no needle in the puncture process can be injected deeply due to the danger of damage to the lung, diaphragm, liver and other structures.

Puncture technique. After tissue infiltration at the puncture site with novocaine during palpation, determine the position of the ribs and in the intended direction the site is punctured with a needle that is held directly by the hand.

The needle is passed through the tissue gradually until the feeling of "failure". At

puncture in the seventh-eighth intercostal space, the end of the needle directed slightly up and back due to the risk of injury

diaphragm After the puncture is completed, the syringe is attached to the cannula of the tube, the nurse removes the clamp from it and, pulling the piston,

tries to remove fluid and air from the pleural cavity.

Errors and dangers:

1) damage to intercostal vessels and nerves (follow the technique puncture);

2) puncture of lung tissue, diaphragm, liver, etc. (do not submerge deep needle and do not make unnecessary movements of the needle in the depth of the tissues);

3) suction of air from the pleural cavity (monitor the tightness of the puncture system and the tight overlap of the rubber one

tubes);

4) the unconscious state of the patient (do not force the pumping of fluid from pleural cavity);

5) infection of the pleural cavity (observe asepsis; in case of doubt upon completion of the puncture, inject solutions into the pleural cavity antibiotics).

Laparocentesis

Indications: obtaining the contents of the abdominal cavity for research, insertion of a catheter, laparoscope, removal of ascitic fluid.

Position of the patient: on the back.

Analgesia: local 0.25-0.5% novocaine solution 10-20 ml.

Technique: manipulation is performed for diagnostic purposes in patients with a closed injury or an acute pathological process in the abdomen. Under puncture of the abdominal wall or below is performed with local anesthesia the navel, or in each of the four quadrants beyond the outer edge of the straight lines muscles. Before the puncture, a small incision is made in the skin. Aponeurosis is stitched with a holding thread, and a sharp hook is lifted for it. The abdominal wall is pierced with rotational and translational movements. The wall with a trocar, the stylet is pulled out, and it is inserted through the sleeve of a polyvinyl chloride catheter with a diameter of 5 mm, a length of 30-40 cm with lateral ones holes. A syringe is attached to the tube and the contents of the abdominal cavities are sucked out. To specify the location of the damage and the accumulation of the content of the catheter successively injected into different areas of the abdominal cavity (right and left hypochondria, in the lateral canals, in the pelvic cavity). Changing the position of the catheter accompanied by the introduction of 10-15 ml of 0.25% novocaine solution through it or other sterile solution. Allocation through a blood catheter or washing waters stained with blood, as well as the contents of cavity organs indicates damage to the organs of the abdominal cavity. Washing water at if necessary, they are subjected to macroscopic, microscopic and biochemical tests research. It should be remembered that the presence of a large retroperitoneal hematomas can also lead to a weak blood staining of the washcloths waters, which are considered as a "pseudo-positive" result. The liquid must be released slowly, observing the condition of the patient. As it is released, her stomach should be pulled up with a towel to prevent unconsciousness as a result of a sharp decline in intra-abdominal pressure due to the movement of blood into the vessels of the abdominal cavity.

A repeated puncture should be performed in other areas of the abdomen.

If necessary, the catheter can not remain in the abdominal cavity more than 2 days. After removing the trocar or catheter, it is applied to the wound with aseptic gauze sticker.

Contraindications: adhesion process, flatulence.

Possible complications: perforation of cavity organs, damage to the vessels of the mesentery of the intestines, the scrotum. To clarify the character of complications that have arisen, it is advisable to perform a laparoscopy. In case of damage to internal organs, laparotomy is indicated.

The use of diagnostic laparocentesis allows you to be confident in making a diagnosis of damage to internal organs in case of blunt trauma to the abdomen or an acute pathological process in the abdominal cavity. Laparocentesis becomes necessary when the injured and the injured arrive with injuries, in a state of shock.

Application and removal of skin sutures.

Imposition:

- indications: treatment of wounds;
- contraindications: purulent processes in the wound, no PHO;
- tools: - anatomical tweezers – 1, surgical – 2.
 - Hegar needle holder – 1,
 - Cooper's scissors – 1,
 - silk,
 - three-sided needles - 2,
 - sterile napkins
 - iodine sticks (or additionally tweezers),

- 1% iodonate solution,
- cleol, trays, mask, oilcloth apron, rubber gloves, containers with disinfectant solutions.

Invite the patient to the dressing room. Have a conversation with him, answer questions, calm him down. Put on a mask, an oilcloth apron. Wash your hands, put on sterile gloves. Cover the micro table. Load the needle with a silk thread (10-12 cm long) using tweezers and a Gegar needle holder. Treat the edges of the wound with iodonate (from the center to the periphery). Grab the edge of the wound with tweezers, pierce the skin and subcutaneous tissue with a needle, leaving 5 mm from the edge of the wound. Stitch the bottom of the wound. Sew the second edge from the inside to the outside, sticking out the needle at such a distance. Close the edges of the wound (with two tweezers, if working together). Tie the ends of the thread on the side of the edge of the wound and cut with a gap of 0.5 cm from the knot. Apply the next seam with an interval of 1-2 cm. Treat the seam with iodonate with wetting movements. Apply a sterile bandage. Disinfect used equipment.

Removal:

- Indications: wound scar that has formed (6-16 days)
 - Equipment: standard dressing equipment, removal kit
- seams:

- Cooper's scissors – 1,
- anatomical tweezers – 1,
- surgical tweezers -1 (sterile in kraft packaging),
- sterile napkins, bix balls in kraft packages,
- solutions: 1% iodonate,
- cleol,
- tweezers – 3,
- tray,
- means of protection for the medical worker: apron, mask, gloves, containers for disinfection.

Invite the patient to the dressing room. Sit or lay the patient in a comfortable position. Carry out hygienic treatment of hands, wear protective equipment. Set out the necessary equipment and soft material. Remove the bandage with surgical tweezers. Remove sutures: we hold anatomical tweezers in the left hand, scissors in the right hand, pull the suture thread by the knot, shifting it to the scar, after the appearance of an uncolored white thread, cross it in this place. Check visually the presence of 4 thread ends. We put the threads in a tray on a napkin. Treat the scar with 1% iodonate. Apply an aseptic bandage. Disinfect the used material and tools, as well as the workplace and protective equipment. Take the patient to the ward, recommend 30-60 minutes. rest, explain the rules of care for the postoperative scar.

Transportation of trauma patients.

One of the most important tasks in the provision of pre-medical care is the organization of quick and safe delivery of the victim to a medical facility. Therefore, it is very often necessary to solve the issue of transportation, transfer, relocation of the victim or his evacuation from the epicenter of the event.

Conditions of moving the victim

Moving the casualty is only necessary if there is no hope of emergency services arriving quickly, or if the casualty needs to be removed immediately from a life-threatening situation. If the victim still needs to be transferred to another place, it is necessary to first of all try to assess the nature and degree of severity of injuries, especially this applies to injuries of the neck and spine. It should be remembered that independent movement of a victim with neck and spine injuries is prohibited, and is possible only if there is a threat to his life.

Cases when it is necessary to transfer the victim to another place may be:

- a large number of cars on the road, the movement of which cannot be blocked;
- staying in a dangerous room if a fire is approaching or a collapse may occur;
- staying in a room filled with gas or poisonous smoke;

— stay in a place where there is no possibility for transport.

You can move the victim if he is breathing on his own. If there is no independent breathing, life-saving measures must be taken. If it was not possible to restore independent breathing, it is forbidden to move the victim's body in order to preserve the scene until emergency services arrive.

Main measures during transportation:

- determination of the method of transportation;
- preparation of the victim, special and emergency vehicles;
- route selection;
- ensuring the safety of the victim and the rescuer during transportation;
- overcoming obstacles, monitoring the victim's condition;
- organization of recreation;
- loading the victim into the vehicle.

Preparation for moving the victim

To move the victim, the rescuer needs to approach him, comfortably place his feet shoulder-width apart for a more stable position, squat down at the level of the victim, bending his legs at the knees, and not bend down, bending at the waist, keep his back straight, firmly grasp the victim with the whole palm, lift him by help legs, not the back.

The victim can be transported:

- without means of transportation (when the movement is carried out only with the help of the rescuers themselves, for example on the hands);
- with the use of means of transportation made of improvised materials (when transportation is carried out with the help of improvised means or means made independently, for example, a chair or a homemade stretcher);
- with the use of special means of transportation (these means include a transport shield, soft stretchers, a wheelchair, a vacuum mattress).

The victim can be transported in a sitting or lying position, and if he is able to move on his own, on foot with support.

The choice of transportation method depends on the following factors:

- the number of assistants;
- height and weight of the victim;
- the distance to which it needs to be moved;
- the topography of the terrain over which it needs to be moved;
- nature and severity of injuries received by the victim;
- the equipment that is available.

Transportation of victims

Walking with support

If the victim can walk independently, but needs support, it is necessary to stand next to the victim from the side of the injury, put the victim's hand around your neck and hold the hand with your hand. With your other hand, wrap the victim around the waist and firmly grab the clothes. This method is not suitable if the victim has suffered an injury to the upper limbs.

On hands

If a child or a light adult needs to be moved, you can use the method of carrying the victim in your arms by taking the victim in your arms from the front. To do this, you need to take the victim under the knees with one hand, and with the other a little above the waist by the shoulders.

On the back

If the victim is light and has enough strength to hold on to the rescuer's neck, he can be carried on his shoulders.

If the rescuer needs to have a free hand, the so-called "Firemen's method" can be used. To do this, you need to help the victim stand up, grab the victim's right wrist with your left hand, bend your legs at the knees, lean forward and carefully direct your shoulder into the victim's groin area so that he gently falls on your shoulders. Cover the victim's knees with your right hand, stand on your feet and distribute the victim's weight so that it falls evenly on your shoulders.

The two of them hold hands

To carry the victim by two rescuers, you can use the method of carrying on the lock with hands

folded into a seat with two, three or four hands. To move a victim who cannot help rescuers, usually due to an injury to the hands, the two-hand lock transfer method is used. To do this, both rescuers squat facing each other on both sides of the victim. With one of their hands, they support the victim's back below the shoulders and grab his clothes. Slightly raising his back, they put their other hand under the legs of the victim and wrap each other's wrists. The rescuers rise at the same time and carry the victim, stepping first with the outer leg, then with the inner one.

The method of transfer to the lock with three hands is used in the case when the victim can hold on with only one hand.

The four-hand lock transfer method is used when the victim can hold on to the rescuers with both hands. To perform it, each rescuer covers the left wrist with his right hand, and then the right wrist of his partner with his left hand. Both squat down, the victim sits on their hands and wraps his arms around their neck, both rescuers rise to their feet and move synchronously at normal speed, taking steps first with the outer and then the inner legs.

Transportation using special means

Also, two people can carry the victim in a sitting position with the help of a special wheelchair or a regular chair with a back, leaning him on the back and holding the chair with one hand from below and the other behind the back.

You can also use a carrying strap or two waist belts connected together for carrying. In this way, it is possible to transport unconscious victims to one or two rescuers.

Dragging

If the victim needs to be urgently removed from a dangerous place, and he cannot stand on his own and cannot be lifted, then you can use the drag method of transportation. To do this, fold the victim's hands on his chest, pull out a jacket or jacket from under him, having previously spread them so that they are under his head. Crouch down next to him, grab the shoulders of the clothes and gently pull. If the victim is not wearing outerwear, take it under the armpits.

In a lying position

It is best to use a stretcher to transport the injured over long distances in a lying position. They can be both special medical and improvised from improvised materials (blankets, sheets, bags, shirts).

When moving the victim on a stretcher, it is important to ensure that his head and neck are at the same level as the body and that the respiratory tract remains free.

The victim must be carried on a stretcher by two people. To do this, the stretcher should be placed on the side of the victim, one rescuer should hold the chest of the victim with one hand and fix the head with the other, the second rescuer should hold the shin from above with one hand and the thigh from below with the other hand. It is also possible to transfer the victim to a soft stretcher using a stable lateral position, if there is no suspicion of a neck and spine injury. Victims with suspected neck and spine injuries should be transported only on a transport medical shield, which can be replaced with a long wooden board if it is not available.

For carrying on a stretcher, it is better to involve as many people as possible, especially with a large mass of the victim. It is correct to carry the victim on a stretcher with his feet forward on a flat surface. Then the rescuer, who is on the side of the head, will be able to control the condition of the victim. Rescuers should walk with short steps, not in step, preventing the stretchers from shaking. When going down, for example, from the stairs, the victim should also be carried with his feet forward, but when going up, on the contrary, with his head forward.

Desmurgia is the doctrine of dressings and methods of applying them for the treatment of injuries and a number of diseases. This is an independent section of general surgery. Desmurgia is a part of practical surgery that studies the application of bandages. It includes two concepts:

1. It is the dressing material that is applied directly to the wound (dry, wet, ointment bandages).

2. The outer part of the bandage, which is used for fixing the dressing material applied to the wound.

Bandage in a broader sense means a complex of means used to protect wounds or pathological centers from the influence of the external environment for a more or less long-term period.

In a narrow sense, a bandage means a material (bandage, patch, etc.) that is applied to a wound to fix the dressing material with medicinal products.

Application of bandages of various types.

1. Applying a "cap" bandage

- the patient is given a comfortable position for applying the bandage;
- a bandage with a length of 80-100 cm (tie) is placed on the middle part of the parietal area of the head and the ends are lowered down in front of the auricles in a stretched state (the ends are held by the victim himself or an assistant);
- the main bandage is made by two circular fixing rounds around the head above the superbrow arches and under the occipital hump (1);
- then the bandage is wrapped around the left end of the tie and led into the previous direction to the back of the head, covering the previous course of the bandage by $\frac{1}{2}$ (2);
- after that, the bandage is wrapped around the right end of the tie and led into the direction of the forehead, covering the previous round (3);
- rounds of the bandage are repeated until the entire vault of the skull is closed (4-16);
- the last round is applied circularly, the end of the bandage is cut lengthwise and tied around the head (you can fasten the end of the bandage with a knot near the tie, prick with a pin or sew);
- the ends of the tie are fixed with a knot in the chin area.

2. Applying a "Hippocratic cap" bandage.

- from a bandage with a width of 7-10 cm and a length of 5-7 m, two heads are prepared by evenly twisting the ends to the middle;
 - the middle of the bandage is placed on the forehead and both heads lead it on the area of the back of the head (indicated by an arrow);
 - the bandage is crossed on the back of the head, then the right head of the bandage continues the circular movement, and with the left - performs a longitudinal movement through the middle part of the head on the forehead (1);
 - here a circular tour of the right head of the bandage covers the longitudinal course and, having made a bend, they lead it to the back of the head, partially covering it (at $\frac{1}{2}$ - $\frac{2}{3}$) previous move, where they bend through a circular move and lead back, covering the other side of the first move (2);
 - these alternations of longitudinal and circular bandage courses are continued until the entire area of the head is closed (3-14);
 - the bandage is fixed with a circular motion of the bandage.
- This bandage can be applied using two separate bandages. Then one bandage is used for fixing tours, and the other for putting a bandage on the hair part of the head (rounds of bandages are superimposed similarly to the previous description).

3. Putting a bandage on the back of the head.

- a fixing tour is applied circularly around the head through the forehead and occipital hump;
- then the bandage is led over the auricle to the left, the bandage is lowered to back, right, front and left surfaces of the neck;
- then the bandage is guided along the back surface of the neck, crossing the previous one course, over the right auricle and circularly around the head;
- in the future, the rounds of the bandage are repeated, overlapping the previous ones by $\frac{1}{2}$ or $\frac{2}{3}$;
- finish the bandage with a circular tour around the head.

4. Putting a bandage on both eyes.

- first make two horizontal rounds through the forehead and back of the head;
- from the occipital region, the bandage is placed under the right auricle and

turn to the right eye, the left parietal hump and circularly around heads; - then the bandage is led from the back of the head through the right parietal hump on the left eye, from below they go around the left auricle, lead to the back of the head and fasten in a circular motion across the forehead and back of the head;
- such alternation of moves is repeated several times until complete closure both eyes; the bandage is finished with a circular motion around the head.

5. Applying a "bridle" bandage.

- start the bandage with two or three horizontal rounds of the bandage around the head through the frontal and occipital areas (1);
- then the bandage is carried along the left temporal area above the auricle and continue down to the back, then the right and front surfaces of the neck and transfer to a vertical stroke on the left cheek in front of the ears (2-3);
- perform the required number of vertical closing moves the entire temporal and parietal areas (4-11);
- after that, the bandage is directed from under the chin to the occipital area and are translated into horizontal circular movements through the chin and back of the head, which fasten the bandage (6, 12);
- if necessary, for more reliable fixation of the bandage, it can be repeated circular tour around the head and again impose several vertical ones bandage rounds;
- finish the bandage with a fixing round around the head.

6. Applying a sling-shaped bandage.

A sling is a strip of bandage or cloth, both ends of which are cut along the middle. The middle part of the sling is not cut and applied to the affected area, while the cut ends serve ties to secure the bandage. The sling is made to measure that part of the body on which it is applied. More often this bandage used for application in the area of the nose (a), chin (b), occipital (c) and parietal (d) areas.

7. Applying a Deso bandage.

- with a fracture of the clavicle, it is first placed in the armpit cotton-gauze roller to prevent debris from shifting;
- before applying the bandage, the arm is bent at the elbow joint at a right angle and is brought to the trunk;
- the bandage begins with circular strokes of the bandage through the middle a third of the shoulder around the chest from the healthy side to the diseased side (1);
- then the course of the bandage is directed from the axilla of the healthy side along the front surface of the chest obliquely to the mountain on the opposite side supraclavicular area (2);
- further vertically down the back surface of the shoulder to the intersection with forearm (3);
- then the course of the bandage wraps around the forearm and goes into the axilla of the healthy one sides, and then along the back to the sore upper arm and down to the elbow (4);
- after circling the elbow from front to back, the tour bandage is led along the back to the armpit hollow of the healthy side, moving to a horizontal tour around chest through the middle of the shoulder (repeating round 1);
- then repeat rounds 2, 3, 4 three or four times and the end of the bandage fasten around the chest.

8. Applying a Velpo bandage.

- a bandage with a width of 10-12 cm is used for the bandage;
- with a fracture of the clavicle, it is first placed in the armpit cotton-gauze roller to prevent debris from shifting;
- before applying the bandage, the arm is bent at the elbow joint, and the hand is moved to the opposite shoulder;
- the hand is fixed by a circular tour around the chest in the direction from damaged to healthy side (1);
- the bandage is transferred to the upper arm from the damaged side (2);
- tour bandage picks up the shoulder from the lateral side on the injured side and transfers to a healthy axillary area (3-4);
- in the future, the rounds of the bandage are repeated, and the horizontal moves lie down below the previous ones, and vertical ones - to the middle of the previous ones (5-18).

9. Putting a bandage on the mammary gland.

- it is better to use a wide bandage (10 cm) for this bandage;
- when applying a bandage to the right mammary gland, the head of the bandage is in place in the right hand, the turns of the bandage lead from left to right and vice versa when applying bandages on the left gland;
- the bandage is fixed in a circular tour around the chest under the mammary gland gland;
- having reached the gland, they cover its lower and inner parts with a bandage and lead the bandage to the opposite upper arm and pass it along the back to the under inguinal fossa (2,4,6);
- cover the lower and outer parts of the gland (3,5,7) and conduct fixing tour bandage (8);
- repeat the previous rounds of the bandage, gradually closing the mammary gland.

10. Applying an occlusive bandage at penetrating wound of the chest cavity.

It is applied in case of penetrating wounds of the chest with development open pneumothorax.

- the edges of the wound are treated with an alcohol antiseptic solution;
- a sterile napkin is applied to the wound;
- a sterile napkin is sealed with an impermeable material (cellophane, oilcloth, rubberized fabric, rubber, etc.), so that this material comes out outside the napkin and lay on the intact skin;
- the bandage in this form is fixed to the chest with a spiral or eight-shaped bandage.

11. Applying a spike-shaped bandage to the shoulder joint.

- the bandage is passed through the healthy inguinal fossa along the front surface chest with a transition to the shoulder (1);
- enveloping the shoulder, the bandage is made on the inner surface of the shoulder and from under the inguinal fossa rises obliquely along the shoulder (2);
- then the bandage is carried along the back in the direction of the healthy sub-inguinal fossa, from where along the front surface of the chest, it returns to the shoulder, closing it the previous round of the bandage is half (3);
- the previous rounds of the bandage are repeated 3-5 times and the bandage is fixed on front chest wall (4-10).

12. Putting a "turtle" bandage on the knee joint.

- a bandage with a width of 5-7 cm is used for the bandage;
- the bandage is applied after bending in the knee joint under the straight line corner;
- a) diverging turtle bandage (right picture)
 - fixing rounds of the bandage are applied in the area of the middle of the knee joint through the patella (1);
 - then the rounds of the bandage spread out, lying now above and then below the fixing ones, covering by 2/3 each previous round (2-9);
 - finish the bandage with circular rounds of the bandage on the thigh;
- b) converging turtle bandage (left picture)
 - a fixing tour is placed in the upper third of the thigh (1);
 - then the bandage is led obliquely along the surface of the bent joint to the back surface hips, enveloping it above the kneecap (10);
 - the bandage is returned over the surface of the joint to the lower leg, covering the former tours for 2/3 (2);
 - then the steps of the bandage are carried out in a similar way, approaching the center and crossing on the side of the joint (3-9);
 - finish the bandage with circular rounds of the bandage on the thigh.

13. Applying a "knight's glove" bandage.

- on the left hand, the bandage begins with the fifth finger, and on the right – with the first; when applying the bandage, the hand is in a pronation position (palm down);
- the bandage begins with fixing rounds around the wrist;
- then bandages are applied to the 2nd-5th fingers according to the spiral method bandages, while transferring the bandage from finger to finger is necessary make a circular fixing tour around the wrist;
- a spike-shaped bandage is placed on the first finger;
- the application of the bandage is completed with a circular tour around the wrist.

14. Putting a bandage on the hand and fingers of the type mitten.

- a narrow bandage (3-5 cm wide) is used for the bandage;
- the bandage begins with fixing rounds around the wrist;
- further, through the back of the hand, the bandage is brought to the end of the finger, encircle it in the form spirals on the back of the hand go to the wrist;
- after a circular tour around the wrist, the bandage is again applied to the finger, placing it a little more proximal to the superimposed courses;
- if necessary, you can repeat the moves, gradually advancing to the base of the finger;
- finish the bandage with circular rounds of the bandage in the wrist area.

Transport and medical tires

They are mainly used to immobilize limbs.

Medical splints are used in hospitals for treatment

fractures of the bones of the limbs. Tires should be strong enough

and easily controlled, provide reliable immobilization. They are made of cardboard, wooden boards (Dieterichs tires), plastic, polyethylene (inflatable tires) or metal (Kramer, Esmarch tires) for the treatment of fractures by the extraction method.

Carrying out transport immobilization in case of damage to the upper limbs:

- a) with a shoulder fracture
 - Kramer ladder tires are used;

- the length of Kramer's tire should be such that it starts from shoulder blades of the healthy side to the middle of the palm);
 - at a distance from the middle of the palm to its ulnar process bend at a right angle (the tire is modeled on a healthy limbs of the victim or on a person with the same physique);
 - the tire is applied to the damaged limb so that the brush is in pronation position, the arm is bent at a right angle in the elbow joint;
 - put a cotton-gauze roller in the armpit, which is fixed with a bandage through a healthy upper arm;
 - the splint is fixed to the arm and torso by applying a spiral bandage from the hand to the shoulder joint, and the upper end of the tire is fixed to the body with an eight-shaped or spike-shaped bandage;
 - tie the upper and lower ends of the tire with a piece of bandage;
 - after the bandaging is completed, a supporting handkerchief or bandage;
- b) with a fracture of the forearm - Kramer's tire is modeled on a healthy hand at a distance from the phalangeal joints to the ulna, bending under a straight line corner;
- the injured hand is placed on a simulated tire in such a way that the forearm was in a position midway between pronation and supination;
 - the tire is bandaged to the hand with a spiral bandage and the hand suspended with the help of a supporting bandage;
- c) with fractures of the bones of the hand and fingers:
- transport immobilization is carried out with plywood or mesh tire
 - the length of the tire from the elbow joint to the fingertips;
 - a cotton-gauze lump like this is placed in the palm of the affected hand the size so that the fingers are in a half-bent position;
 - the tire is fixed to the hand with a spiral bandage and placed on a handkerchief

Transport immobilization for injuries of the lower limb:

a) with hip fractures:

The most acceptable transport tire Dieterichs, for

with the help of which the limb is immobilized and stretched along the axis.

- the outer and inner crutches are adjusted along the length of the limb as follows in such a way that the stop of the outer crutch rests in the armpit, and the inner one - in the crotch; the lower ends of both extensions should protrude beyond the sole on 10-15 cm;
- with the help of pins, the extensions are connected to the upper plates through holes, for the reliability of fixing the pins can be fixed with several rounds bandage;
- fix the foot pad to the sole of the foot (without removing the shoes!) bandage 8- with a similar bandage, especially securely attaching the rear part the footman to the heel, because this part accounts for its main traction force when pulling;
- attach an external crutch along the body, bringing out the lower end extensions through the side eye of the metal bracket of the riser;
- the stop of the crutch is fixed in the armpit with a piece of bandage, beforehand pull through the upper pair of slits, which are tied on the opposite side upper arms;

- an internal crutch is fitted, passing the lower end through the side the eyelet of the footrest, and the stop of the inner crutch is fixed to the crotch with a bandage, pull it through the slits of the plate, the bandage is carried around the hip upper third;
- the lower ends of both crutches are connected by a connecting bar, through through the hole of which a double twisting cord is passed, and it is fixed to the bracket the instigator After that, the upper part of the outer crutch is fixed to body with a spiral bandage (use a bandage with a width 10-15 cm).
- the internal crutch in the upper third is fixed around the thigh with several rounds of the bandage, after which they begin to pull it out. Extension is carried out manually, carefully pulling the foot and twisting the twist. Pulling should not be excessive so as not to cause additional pain to the victim
- between the crutches and bony protrusions, cotton gauze is placed gaskets
- the tire is tightly fixed with a bandage, applying a spiral bandage from the ankles to the armpits. through a healthy upper arm;

Control materials for the final stage of the lesson: situational tasks.

Situational task No. 1.

The patient needs removal of skin sutures. Your actions?

- Situational task No. 2.

- The child has a hip fracture. Your actions?

Situational task No. 3.

Woman, 38 years old, with pneumothorax after a fall. Your actions?

Questions about current control.

1. Transportation of a victim with a spinal fracture.
2. Transportation of a victim with polytrauma.
3. PHO wounds.
4. Treatment of a necrotized wound.
5. Treatment of ulcerative wound.
6. Types of surgical instruments.
7. Types of bandages and tires.

1. Summary:

Current evaluation criteria in practical training

Rating	Evaluation criteria
Perfectly "5"	The applicant is fluent in the material, takes an active part in discussing and solving the situational clinical problem, confidently demonstrates practical skills during the examination of the patient simulator. Expresses his opinion on the topic of the lesson, demonstrates clinical thinking.
Fine "4"	The winner has a good command of the material, participates in the discussion and solution of a situational clinical problem, demonstrates practical skills during the examination of a patient simulator with some errors, expresses his opinion on the subject of the lesson, demonstrates clinical thinking.
Satisfactorily "3"	The acquirer does not have sufficient knowledge of the material, is unsure of participating in the discussion and solution of the situational

	clinical problem, demonstrates practical skills during the examination of the patient simulator with significant errors.
Unsatisfactorily "2"	The acquirer does not possess the material, does not participate in the discussion and solution of the situational clinical problem, does not demonstrate practical skills during the examination of the patient simulator.

2. List of recommended literature:

Main:

4. Emergencies in the practice of a therapist and family doctor / under the editorship Yepishyna A.V. – ISBN: 978-966-673-122-0. Ukrmedknyga 2019p. 380 pages .
5. Mechanical Ventilation in Emergency Medicine . by Susan R. Wilcox & Ani Aydin & Evie G. Marcolini . ISBN 978-3-319-98409-4 ISBN 978-3-319-98410-0 (eBook).
<https://doi.org/10.1007/978-3-319-98410-0/2019> . 122 pages
6. Acute Medicine : A Practical Guide that the Management of Medical Emergencies , 5th Edition / David C. Sprigings (Editor), John B. Chambers (Editor) - ISBN: 978-1-118-64428-7. July 2017 Wiley-Blackwell , 784 Pages

Additional:

3. The Complete First Aid Pocket Guide . by John Furst / ISBN 9781507208892 - Adams Media , 2018. 190 pages
4. Manual of emergency medicine / editor , G. Richard Brian . — 6th ed . ISBN: 978-1-60831-249-8. May 23, 2011. 704 pages

Electronic information resources:

10. <https://zakon.rada.gov.ua/laws/show/z0356-22#n42>
11. https://courses.prometheus.org.ua/courses/NMU/Cardiology101/2017_T1/course/
12. <https://emergencymanual.stanford.edu/downloads/>
13. <https://www.coursera.org/learn/infarction>
14. <https://www.coursera.org/learn/managing-asthma-allergies-diabetes-and-seizures-in-school>
15. <https://www.futurelearn.com/courses/critical-care>
16. <https://www.medscape.org/viewarticle/964673>
17. <https://www.medscape.org/viewarticle/964201>
18. <https://www.medscape.org/viewarticle/965140>

Practical lesson No. 3

SUBJECT: INJECTION TECHNIQUE

Goal: Mastering basic practical skills in the work of a nurse.

A student of higher education must:

- to know: the main types of injections and the execution algorithm.
- be able to:
- make intramuscular, intradermal, subcutaneous, intravenous and intraosseous injections.

Basic concepts: injections

Plan:

1. Organizational activities: greetings, verification of those present, announcements topics, goals of the lesson, motivation of higher education students regarding the study of the topic.
2. Control of the reference level of knowledge: frontal survey of applicants of higher education in order to determine the level of theoretical readiness of applicants before practical classes:
 - technique of intramuscular injection;
 - technique of intradermal injection;
 - subcutaneous injection technique;
 - intravenous injection technique;
 - technique of intraosseous injection;
3. Formation of professional skills.

Content of tasks:

- performing various types of injection

Recommendations (instructions) for performing tasks.

Intradermal injections are used for allergic reactions tests (detection of various natural and artificial allergens), immunological test for tuberculosis (Mantoux test), brucellosis (Burne test), echinococcosis (Canzoni test), for hidden swellings (McClure-Aldrich test), for local anesthesia, for vaccination..

Subcutaneous injections provide a relatively quick (after 15-20 minutes) absorption of drugs into the general circulation.

For performing an intradermal injection on the body's sensitivity the medicine used for the first time is used for the drug prescribed to the patient (eg, antibiotic, novocaine, insulin, etc.). For tuberculin is used to diagnose tuberculosis, brucellosis - brucellin, tularemia - tularin, dysentery - dysenterin Tsuverkalov (all drugs are produced in solutions ready for administration).

Preliminary preparation for performing the skill:

Intramuscular injections are used when necessary get a faster effect than with a subcutaneous injection, because the muscles better than the subcutaneous base, are supplied by blood and lymph, as well as in in cases when the drug when administered subcutaneously causes local tissue irritation. Medical plays a big role in the injection sister From how clearly and skillfully she performs her duties responsibilities, the success of patient treatment also depends. Inept execution of that or another injection, mistakes or inattention during their administration, negligence the nurse's attitude to her duties may be the reason severe consequences for the patient.

Remember! A nurse carries not only a moral duty responsibility for the health care of patients, as well as legal responsibility.

Technique of intradermal injections

Preliminary preparation for performing the skill:

- wash your hands thoroughly twice with soap under running water, wipe dry

with a clean individual towel, treat with an antiseptic,
wear a mask and sterile rubber gloves;
- release the disposable syringe and needle from the package
- put 0.2 ml of the drug from the ampoule into the syringe
or bottle;
- put the syringe with the collected medicinal product on a sterile surface
tray;
– put 2 sterile cotton balls soaked in 70° solution on this tray
ethyl alcohol, and 1 sterile, dry cotton ball;
- psychological preparation of the patient;
- offer the patient to sit comfortably on a chair, free his hand to
elbow joint from clothing, the hand should be placed on the table in
comfortable stretched and relaxed position.

The main stages of performing the skill:

1. Mark the injection site in the middle third of the inner surface
forearm, where there are no vessels and tendons.
2. Wipe the injection site with sterile cotton balls soaked in
76° ethyl alcohol solution, twice (initially a larger area, a
then directly to the injection site.
3. Take the syringe with the medicine in the right hand so that the II finger
held the needle sleeve, I, III and IV fingers - casually with the tips
fingers supported the cylinder, and V finger - the piston.
4. After drying the skin, grasp the patient's forearm with the left hand
from below (one finger on one side, second to fifth - on the other) and lightly
stretch the skin
5. Place the needle in relation to the skin with the cut up, almost parallel to
skin surface.
6. Insert the needle at an acute angle into the thickness of the skin so that it sinks into it
cut.
7. Carefully release the left hand.
8. With the thumb of the left hand, slowly press the piston and enter
0.1 ml of the drug. When correctly administered at the injection site
a whitish infiltrate resembling lemon will form
crust
9. After administering the drug, remove the needle; wool to the needle during it
do not apply extraction!
10. With a dry, sterile cotton ball, lightly (so as not to squeeze out the liquid,
which is close to the surface) to remove drug residues
of the drug near the injection site.
11. Dispose of used cotton balls, syringes and needles.

Subcutaneous injection technique

Preliminary preparation for performing the skill:

- wash your hands thoroughly twice with soap under running water, wipe dry
a clean individual towel or a sterile disposable one
with a napkin, treat with an antiseptic, put on a mask, sterile rubber gloves;
– release the disposable syringe and needle from the packaging;
- fill the syringe with the dose of the drug indicated on the leaflet
appointments, from an ampoule or bottle;
- put the syringe with the collected drug on a sterile tray;
– put 3 cotton balls soaked in a 70° ethyl alcohol solution on this tray
alcohol;

- psychological preparation of the patient;
- when injecting drugs into the outer surface of the shoulder, offer the patient it is convenient to sit on a chair, free the injection site from clothing. Hand should be slightly bent in the elbow joint;
- when injecting drugs into the subscapular area, offer the patient sit on a chair, straighten your back and press against the back of the chair left or right side. The hand on the side of the injection should be lowered and a little take it back, while it will be easier with the nurse's left hand capture the skin with the subcutaneous base in a fold;
- when drugs are injected into the front-outer surface of the thigh or in lateral areas of the abdomen, offer the patient to lie on his back, relax;
- patients with a labile nervous system, prone to dizziness, regardless of the selected place of administration of the drug, the manipulation should be performed in a supine position.

The main stages of performing the skill:

1. Mark the injection site (outer surface of the shoulder, subscapular area, anterior-external surface of the thigh, lateral surfaces of the abdomen), where the skin and subcutaneous tissue are well folded and absent danger of damage to blood vessels, nerves and periosteum.
2. Palpate the selected place. The injection cannot be performed in places of edema or compactions (infiltrates) that remained from previous injections.
3. Wipe the injection site twice with sterile cotton balls, soaked in a 70° solution of ethyl alcohol.
4. Take the syringe filled with medicine with the right hand so that the second finger held the needle sleeve, the last ends of the fingers were casually a cylinder syringe. At the same time, point the cut of the needle upwards.
5. Grab the skin with the index and thumb of the left hand subcutaneous base in the corresponding area in the fold.
6. With a quick movement at an acute angle (40°-45°), insert the needle with the cut up by 2/3 of its length to the base of the formed fold, i.e. to a depth of 1-2 cm. At the same time, the needle enters the subcutaneous base. It is necessary to follow so that the needle was not inserted completely and remained above the skin part of the needle with a length of at least 0.5 cm
7. After piercing the skin, release the fold with the first or second finger press the piston handle with your left hand and completely inject the medicine under the skin
- 8 Apply a sterile cotton ball to the injection site with your left hand, soaked in a 70° solution of ethyl alcohol, and pulled out with a quick movement a needle. With the same cotton ball, make a light massage of the injection site drugs so that they are better distributed in the subcutaneous basis, as well as to prevent the occurrence of hemorrhages in case of injury to the vessel wall with a needle. It is not necessary to do a massage after the introduction of insulin.
9. Dispose of used cotton balls, syringes and needles.

The technique of intramuscular injection

Preliminary preparation for performing the skill:

- wash your hands thoroughly twice with soap under running water, wipe dry a clean individual towel or a sterile disposable one with a napkin, treat with an antiseptic, put on a mask, sterile rubber gloves
- release the disposable syringe and needle from the packaging;
- put in the syringe the dose of the medicinal product, which is indicated on the sheet appointments, from an ampoule or bottle;

- put the syringe with the collected drug on a sterile tray;
put 3 cotton balls soaked in a 70° ethyl alcohol solution on this tray alcohol;
- psychological preparation of the patient;
– patients with a labile nervous system, prone to dizziness, regardless of the selected place of administration of the drug, the manipulation should be performed in a supine position

The main stages of performing the skill.

1. Choose an injection site (buttocks - the patient lies on his side or on his stomach; the front outer surface of the thigh - on his back)
2. Palpate the selected place. The injection cannot be performed in places of edema or compactions (infiltrates) that remained from previous injections.
3. Wipe the injection site twice with sterile cotton balls, soaked in a 70° solution of ethyl alcohol.
4. Hold the drug-filled syringe with the needle in your right hand so that the little finger supports the needle sleeve, the index finger is placed on the plunger, and the remaining fingers hold the syringe barrel
5. Ask the patient to relax the muscles
6. With the index and thumb of the left hand, stretch and fix the skin with subcutaneous fat in the appropriate area
7. Perpendicular to the surface of the skin of the buttock (into the thigh at an angle of 70°), quickly insert the needle to a depth of 4 cm, while piercing the skin, subcutaneous fat, fascia and muscle. Make sure that a part of the needle 0.5 cm long remains above the skin
8. Release the fixed area, pull the syringe piston towards you, make sure that the needle has not entered the lumen of the blood vessel
9. Slowly inject the drug into the muscle
10. With your left hand, apply a sterile cotton ball to the injection site and pull out the needle with a quick movement, and make a light massage with the ball so that the medicine is better distributed in the muscle area
11. Discard used cotton balls, syringe and needle.

Technique of intravenous injection

Preliminary preparation for performing the skill:

- wash your hands thoroughly twice with soap under running water, wipe dry a clean individual towel or a sterile disposable one with a napkin, treat with an antiseptic, put on a mask, sterile rubber gloves
- release the disposable syringe and needle from the packaging;
- put in the syringe the dose of the medicinal product, which is indicated on the sheet appointments, from an ampoule or bottle;
- put the syringe with the collected drug on a sterile tray;
put 3 cotton balls soaked in a 70° ethyl alcohol solution on this tray alcohol;
- psychological preparation of the patient;
– patients with a labile nervous system, prone to dizziness, regardless of the selected place of administration of the drug, the manipulation should be performed in a supine position

The main stages of performing the skill.

1. Put a rubber tourniquet (on a shirt, a towel) on the patient's shoulder above the elbow bend so that the free ends are directed upwards, and make sure there is a pulse on the radial artery.
2. Ask the patient to clench and unclench the fist several times.
3. Ask the patient to make a fist and palpate the veins of the elbow.

4. Wipe the inner surface of the elbow bend with two cotton balls soaked in alcohol.
5. Take the syringe in your right hand so that the 2nd finger fixes the needle sleeve, 5th - the piston, and the others embrace the syringe cylinder.
6. Fix the vein by slightly pulling the skin above it with 1 or 2 fingers of the left hand.
7. Hold the syringe parallel to the skin with the tip of the needle and the scale up.
8. Puncture the skin above the vein and carefully insert the needle into the vein, passing it through the vessel. When you feel a "failure", gently pull the piston towards you until blood appears in the syringe.
9. Remove the harness with your left hand.
10. Press the piston handle with your left hand without changing the position of the syringe. Inject the medicine slowly, leaving 0.5-1 ml of liquid in the syringe.
11. Apply a cotton ball dipped in alcohol to the injection site. Pull the needle out with a sharp movement.
12. Discard used cotton balls, syringe and needle.

Intraosseous injection technique

This is an alternative to intravenous administration of medication in those cases when other methods of delivering drugs to the body are technically not possible or there are contraindications to their use. It is more often used in children younger than 3 years, but if necessary, it can be used in all age groups. Intraosseous access is carried out using a syringe gun (boninjector) for intraosseous injections

The best place is the anterior inner surface of the tibia, because it is located just under the skin and is easy to

identification. The front surface of the thigh and the crest of the iliac bone, sternum, calcaneus can also be used [

Bones with existing fractures and osteomyelitis cannot be used

Conducting technique:

1. On the scale of the gun, you should select the required depth of penetration by unscrewing the sleeve from the cylindrical casing
2. The most approved and used place for needle insertion is the anterior medial surface of the proximal part of the body of the tibia (upper articular surface of the tibia). By palpation, find the hump of the tibia directly below the knee. Determine the upper articular surface of the tibia - the place for injection (it is located approximately 1-2 cm medial to the tibial tuberosity).
3. Treat the injection site.
4. At an angle of 90°, slightly position the front part of the boninjector in the entry points with the leading hand, while holding and pressing strongly on the back part. With the other hand, firmly support this leg, trying not to touch it from behind. If necessary, you can use a roll made of a towel for additional leg support.
5. Unfasten the safety latch from the device by simultaneously pressing on both sides.
6. Bring the boninjector to readiness by pressing the rear part to both handles of the casing
7. Remove the boninjector and separate the trocar needle from the case.
8. Pull out the trocar stylet and separate it from the needle. Only the cannula of the needle should remain in the bone

Table. Determination of the size and depth of boninjector needle insertion depending on the age of the patient

Age of the patient	Needle size	Depth of needle penetration, cm
Adults (>12 years)	15 G - blue color	2.5
Children from 6 to 12 years old	18 G - red color	1.5
Children from 3 to 6 years old	18 G - red color	1.0-1.5
Children from 0 to 3 years	18 G - red color	0.5-0.7

9. Make sure of the correct introduction by trying to introduce the liquid. The liquid should pour in easily, without penetrating from the blood vessels into the tissues.
10. Provide the device with a reliable stop and stability, using a safety latch.
11. Medicines are administered under slight pressure manually using syringes or by inflating the cuff around the infusion bag.
12. If the introduction is not successful, the procedure is repeated on the other leg.
13. Boninjector remains in place for several hours. The intraosseous method of infusion should be replaced by traditional intravenous as soon as possible.

Control materials for the final stage of the lesson: situational tasks.

Situational task No. 1.

The patient needs a blood transfusion. What injection technique will you use? IN

- Situational task No. 2.

- A patient with burns of the trunk and upper limbs needs infusion therapy. What injection technique will you use?

Situational task No. 3.

A 2-year-old girl at the clinic for vaccination. What injection technique will you use?

Questions for current control:

1. What device is used for intracystic injection?
2. How to determine the place for intravenous injection?
3. What drugs are subcutaneous injections used for?
4. Name the location for intramuscular injections?

4. Summary:

Current evaluation criteria in practical training

Rating	Evaluation criteria
Perfectly "5"	The applicant is fluent in the material, takes an active part in discussing and solving the situational clinical problem, confidently demonstrates practical skills during the examination of the patient simulator. Expresses his opinion on the topic of the lesson, demonstrates clinical thinking.
Fine "4"	The winner has a good command of the material, participates in the discussion and solution of a situational clinical problem, demonstrates practical skills during the examination of a patient simulator with some errors, expresses his opinion on the subject of the lesson, demonstrates clinical thinking.
Satisfactorily "3"	The acquirer does not have sufficient knowledge of the material, is unsure of participating in the discussion and solution of the situational clinical problem, demonstrates practical skills during the examination of the patient simulator with significant errors.
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3. List of recommended literature:

Main:

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Yepishyna A.V. – ISBN: 978-966-673-122-0. Ukrmedknyga 2019p. 380 pages .

8. Mechanical Ventilation in Emergency Medicine . by Susan R. Wilcox & Ani Aydin & Evie G. Marcolini . ISBN 978-3-319-98409-4 ISBN 978-3-319-98410-0 (eBook).
<https://doi.org/10.1007/978-3-319-98410-0/2019> . 122 pages
9. Acute Medicine : A Practical Guide that the Management of Medical Emergencies , 5th Edition / David C. Sprigings (Editor), John B. Chambers (Editor) - ISBN: 978-1-118-64428-7. July 2017 Wiley-Blackwell , 784 Pages

Additional:

5. The Complete First Aid Pocket Guide . by John Furst / ISBN 9781507208892 - Adams Media , 2018. 190 pages
6. Manual of emergency medicine / editor , G. Richard Brian . — 6th ed . ISBN: 978-1-60831-249-8. May 23, 2011. 704 pages

Electronic information resources:

19. <https://zakon.rada.gov.ua/laws/show/z0356-22#n42>
20. https://courses.prometheus.org.ua/courses/NMU/Cardiology101/2017_T1/course/
21. <https://emergencymanual.stanford.edu/downloads/>
22. <https://www.coursera.org/learn/infarction>
23. <https://www.coursera.org/learn/managing-asthma-allergies-diabetes-and-seizures-in-school>
24. <https://www.futurelearn.com/courses/critical-care>
25. <https://www.medscape.org/viewarticle/964673>
26. <https://www.medscape.org/viewarticle/964201>
27. <https://www.medscape.org/viewarticle/965140>

Questions for final control.

1. Concepts of hemostasis, bleeding and blood loss.
2. Classification of bleeding.
3. Determination of the severity of the patient with bleeding.
4. Ways to temporarily stop bleeding.
5. Finger pressing of the artery according to localization.
6. Types of harnesses and turnstiles.
7. Macroscopic assessment of the benign quality of blood.
8. Determination of blood group.
9. Determination of the Rhesus factor.
10. Determination of blood compatibility.
11. Responsibilities of a surgical department nurse.
12. Methods of processing hands.
13. Treatment of the operating field.
14. PHO.
15. Selection of tools for venesection.
16. Selection of tools for tracheostomy.
17. Selection of instruments for laparocentesis.
18. Technique of thoracentesis.
19. Laparocentesis technique.
20. Transportation of a trauma patient.
21. Applying bandages of various types.
22. Laying tires of various types.
23. Intradermal injections.

24. Subcutaneous injections.
25. Intramuscular injections.
26. Intravenous injections.
27. Intraosseous injections.