

Ministry of Health of Ukraine
Ukrainian Medical Stomatological Academy

APPROVED
at a meeting of the department
disaster medicine
and military medicine
«____» _____ 2020
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Head of Department

K.V. Shepitko

**Methodical instructions
for independent work of students
during preparation for a practical (seminar) lesson
and in class**

Academic discipline	Training of reserve officers
Module № 1	Pre medical care in extreme situations
Topic of the lesson	Providing home care for thermal and chemical injuries.
Course	2
Faculty	foreign students training specialty "Medicine", "Stomatology"

- 1. TOPIC
- 8. PROVISION OF DOMESTIC CARE FOR THERMAL AND CHEMICAL INJURIES
- Relevance of the topic:
 - According to statistics of local conflicts in recent years, burns occupy 5% of the average injuries on the battlefield. During the war in the Korean guardianship of napalm, the current American aircraft, accounted for 25%, in itnam - 45%, and according to general statistics during the war in Afghanistan - 5% of the headline number of processed mehandihandi (). In modern warfare, when nuclear weapons and incendiary mixtures get stuck, the frequency of burns can be 60-80% of all lesions.
 - During the Second World War 1941-1945. Years of frostbite of the extremities were combined with injuries in 32.2% of cases. Such a large percentage is due to the knowledge of the wounded and his helplessness, because of him he remained lying in the snow on the frozen ground for a long time.
 - Thus, frostbite is considered a frequent companion of wars, indie has the character of epidemics and occupies a significant share in the structure of sanitary losses. The fingers of the upper and lower extremities, ears, nose, and external genitalia are mainly frozen. According to wartime and peacetime statistics, frostbite of the lower extremities predominates.
- Specific goals:
 - • allowance for home care for burns in combat and non-combat conditions;
 - • transfer of home care for trench foot freezing in combat and non-combat conditions;
 - • supervision of domestic assistance in case of fugitive combat fires in combat and non-combat conditions.
 - • be able to solidify by warming the mixture
 - • be able to use a thermal blanket
 - • know the mechanism of overheating
 - • know the mechanism of hypothermia

Competences and learning outcomes, the formation of which is facilitated by the discipline (the relationship with the normative content of training of higher education, formulated in terms of learning outcomes in the Standard).

According to the requirements of the standard, the discipline provides students with the acquisition of competencies:

-integral: The ability to solve typical and complex specialized problems and practical problems in professional activities in the field of health care, or in the learning process, which involves research and / or innovation and is characterized by complexity and uncertainty of conditions and requirements. The ability of the individual to organize an integrated humanitarian educational space, the formation of a single image of culture or a holistic picture of the world.

-general: The ability to apply knowledge in practical situations. Ability to exercise self-regulation, lead a healthy lifestyle, ability to adapt and act in a new situation. Ability to choose a communication strategy; ability to work in a team; interpersonal skills. Ability to abstract thinking, analysis and synthesis, the ability to learn and be modernly trained. Definiteness and perseverance in terms of tasks and responsibilities.

-special (professional, subject): Ability to carry out medical and evacuation measures. Ability to determine the tactics of emergency medical care. Emergency care skills. Skills to perform medical manipulations.

Basic knowledge, skills, abilities necessary for studying the topic (interdisciplinary integration):

Names of previous disciplines	Acquired skills
1. Human anatomy	Anatomy of the head and neck, anatomy of the chest, abdomen, pelvis and limbs. Anatomy of the vascular system.
2. Normal physiology	Physiological bases of respiratory system functioning.

Tasks for independent work in preparation for class and in class:

1. Providing home care for burns in combat and non-combat conditions; ;
2. Provision of home medical care for freezing of the trench foot in combat and non-combat conditions;
3. Provision of home medical care for those affected by combat fire mixtures in combat and non-combat conditions.

The list of the basic terms, parameters, characteristics which the student should master at preparation for employment:

Term	Definition
Burns	it is damage (destruction of structures) of skin and tissues of an organism which arises as a result of local action of high temperature, chemicals, an electric current or ionizing radiation.
Freezing	functional and morphological changes in body tissues due to low temperatures
Trench stop	one of the forms of frostbite

Freezing	that develops due to prolonged, at least 3-4 days, cooling of the limb in a humid environment.
Hyperthermia	<p>This is a general pathological hypothermia of the body due to a progressive drop in body temperature under the influence of the cooling action of the environment, when the protective thermoregulatory properties of the body are insufficient.</p> <p>it is a pathological condition of the body that occurs due to a violation of thermoregulation and / or the action of external heat.</p>

Theoretical questions for the lesson:

1. Burns, classification, signs, home care in combat and non-combat conditions.
2. Frostbite, classification, symptoms, home care in combat and non-combat conditions.
3. Trench foot, freezing, home care in combat and non-combat conditions.
- Hyperthermia, home care in combat and non-combat conditions.
4. Electric shock, lightning and home care.
5. Features of defeat by fighting fire mixes, home medical care. Affected by acids and alkalis, home care.
6. Features of care for eye burns of various etiologies.

Practical work (tasks) performed in class:

Practical skills in providing home care for burns in combat and non-combat conditions; providing home care for freezing of the trench foot in combat and non-combat conditions., home care for electric injuries.

TOPIC CONTENT:

According to local conflict statistics in recent years, burns account for 5% of injuries on the battlefield. During the Korean War, burns from napalm used by US aircraft accounted for 25%, Vietnam for 45%, and general statistics for the war in Afghanistan for 5% of total sanitary losses (mostly among mechanized units). In modern warfare, with the use of nuclear weapons and incendiary mixtures, the incidence of burns can be 60-80% of all injuries.

During the Second World War of 1941-1945, frostbite of the extremities was combined with injuries in 32.2% of cases. Such a large percentage is due to the bleeding of the wounded and his helplessness, which is why he remained lying in the snow on frozen ground for a long time.

Thus, frostbite is considered a frequent companion of wars, sometimes has the character of epidemics and occupies a significant share in the structure of sanitary losses. Frostbite, mainly the fingers of the upper and lower extremities, ears, nose, and sometimes the external genitalia. According to wartime and peacetime statistics, frostbite of the lower extremities predominates.

Burns are damage (destruction of structures) of the skin and tissues of the body, which occurs as a result of local exposure to high temperatures, chemicals, electric current or ionizing radiation.

According to the determining factor, burns are divided into thermal, electrothermal, chemical, radiation, combined lesions and burns with combat incendiary mixtures.

Grade I burns are characterized by damage to the cells of the surface layers of the skin, manifested by redness, swelling and pain in the affected area, which subsides after 1-2 days, and after 3-4 days the swelling and redness disappear. Sometimes there is pigmentation of burnt areas.



Fig. 1. Burns of I-IIA degree

Grade IIA burns are accompanied by severe pain and blisters of various sizes, filled with yellowish or hemorrhagic fluid. Blisters appear immediately after burns, in a few hours or the next day. The skin pales when pressed.

With the accession of a secondary infection, the contents of the blisters become purulent. Swelling and redness of the burn wound increases. If there are no complications of the purulent process, complete recovery of the skin and recovery occurs in 1-3 weeks without scarring.



Fig. 2. Burns of II-A degree

Grade II-B burns are burns with a lesion of the deep layer of the skin, accompanied by necrosis of its entire thickness with the formation of a necrotic scab that does not fade when pressed. Characterized by a significant loss of sensitivity in the area of the scab. There is a large swelling around the burn. It can heal on its own in 3-6 weeks.



Fig. 3. Burns of II-B degree

Grade III burns (necrosis) are accompanied by complete death of the skin, subcutaneous fat and deeper tissues (muscles, tendons, bones). The scab is thick, dense, sometimes with signs of charring. At the site of such burns, deep wounds are formed that do not heal on their own, a skin graft is required. Such a burn heals after suppuration and rejection of dead areas. Sometimes even amputation of the limb is required. Coarse keloid scars, ulcers and contractures can form.



Fig. 4. Burns of the III degree

Combined degrees of burns are more common

The depth of the burn is determined by local external signs: redness, blisters, scab formation.

In addition to the degree of burns, it is important to determine the total area of burns.

To determine the area of burns, you can use two main methods:

Palm rule. The palm together with the fingers makes up about 1% of the body surface. How many palms of the wounded will fit over the burn surface, so is the area of burns. This method is used when the burns are small or located in different parts of the body.

The rule of nines is used for extensive burns

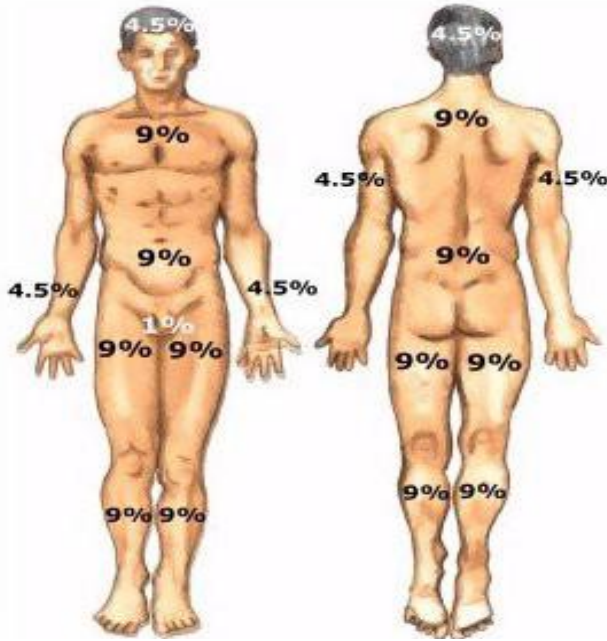


Fig. 4. Rule of nines to determine the area of burns

At superficial burns more than 20-30% and deep burns more than 10% of a body surface (at children of 5%) the expressed general frustration of activity of all organism - a burn disease develops. The development of this condition is influenced by the depth and area of the burn. Adverse factors include comorbidities, childhood and old age of the victim, concomitant burns of the upper respiratory tract, eyes, genitals, etc.

The depth of the burn determines the duration of its healing, and hence the time of the burn disease, the probability of joining the secondary infection, the possibility of self-healing. The area of the burn is the main criterion for determining the prognosis of the burn disease.

The course of burn disease complicates the burn of the upper respiratory tract.

Flames, hot air and combustion products in closed fires (dugouts), military equipment and in the use of combat fire mixtures often affect the respiratory system. At inhalation of hot air in some hours the expressed hypostasis of a mucous membrane of an oral cavity and VDSH with development of asphyxia can be noted.

Burns of the upper respiratory tract may indicate: hoarseness, shortness of breath, cough, complaints of sore throat, burns of the mucous membranes of the lips, tongue, pharynx, nose, burnt hair in the nasolabial triangle.

1. Home care for thermal burns (see Algorithm "Providing home care for burns").
2. The higher the temperature of the injuring agent and the longer the contact with it, the wider and deeper the thermal damage. Based on this provision, the main thing in providing assistance to a burn victim is to eliminate the traumatic factor.
3. REMEMBER !!!

4. We assess the condition of victims with burns and provide them with home care according to the SAVS algorithm.
5. 1. Extinguish the flame or remove the injuring agent.
6. 2. Move the wounded to a safe area.
7. 3. Assess the condition and provide home care according to the SAVS algorithm.
8. 4. Cool the affected area. For this purpose it is necessary to use a large amount of running water, or cooling service anti-burn (hydrogel) bandages.



Fig. 5. Anti-burn (hydrogel) bandage on the face

Remove clothing, ammunition and all tightening items. As the swelling of the ring or bracelet increases, it can pinch the tissue and cause amputation and loss of a finger or limb, so remove them as soon as possible.

Cover the patient with a clean, dry sheet or thermal blanket to prevent further contamination during transportation and loss of temperature.

Provide vascular access. If possible, do this through unburned skin, if necessary - through burnt, securely fasten the ivory catheter.

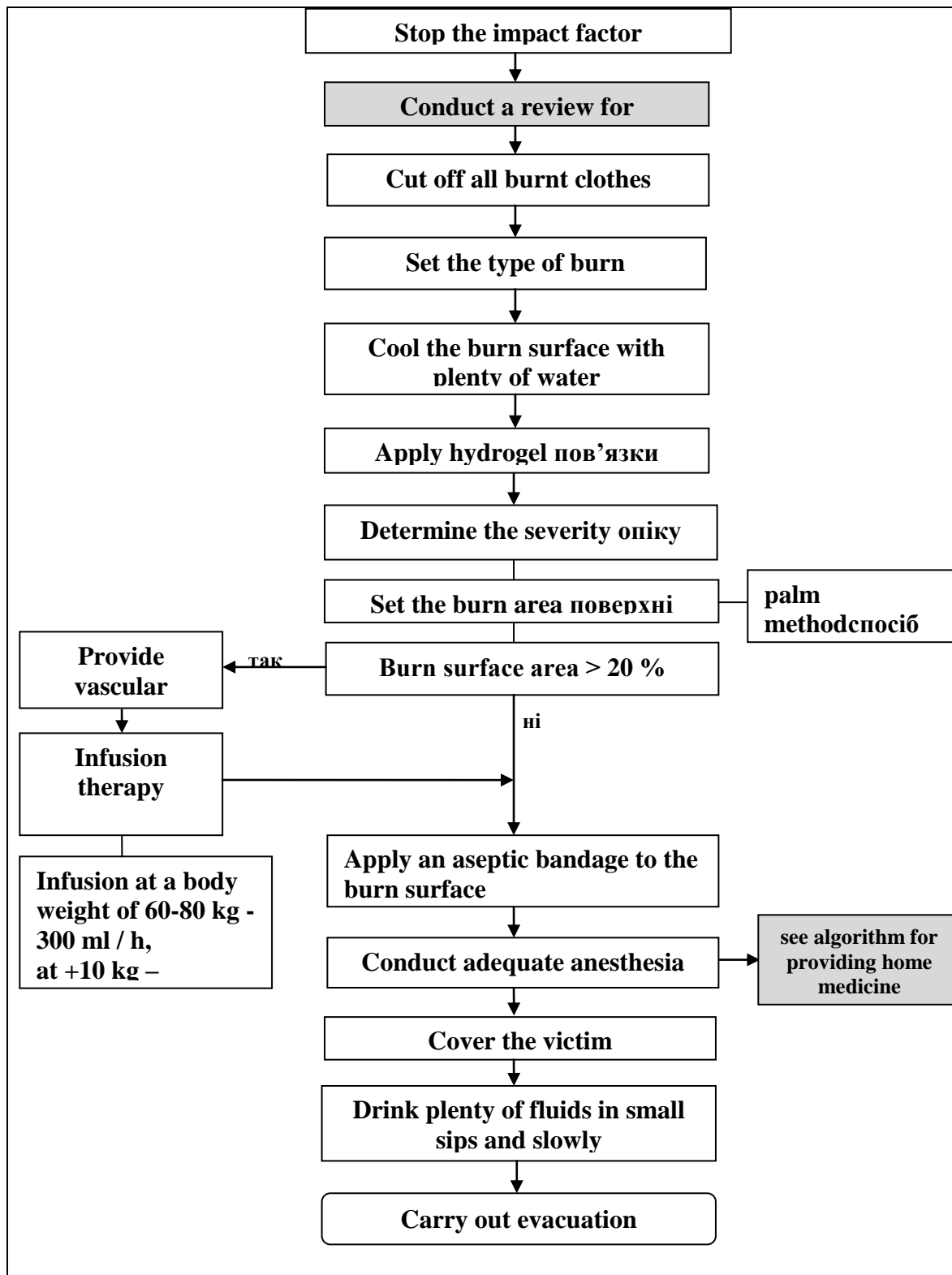
Start the infusion using lactated Ringer's solution (LRR) or its analogues at the rate of: at a body weight of 60-80 kg - 300 ml / h. At body weight more than 80 kg - on each additional 10 kg + 100 ml / hour (yes, at body weight of the victim of 100 kg it is necessary to drip 500 ml / hour). Continue during evacuation. In the absence of LRR, use 0.9% saline.

Insert a urinary catheter. It will help control diuresis. Due to the flood, we must achieve a rate of 1 ml / kg of body weight.

In case of airway damage to eliminate bronchospasm and reduce swelling of the laryngeal mucosa - 150-200 mg of hydrocortisone or 60-90 mg of prednisolone, ephylline, antiallergic drugs are administered intramuscularly.

10-12 drops of vaseline oil are instilled into the nasal passages. Increasing asphyxia due to laryngeal edema is an indication for intubation or, if it is impossible, for conicotomy

ALGORITHM OF DOMESTIC CARE FOR BURNS
(shelter sector, evacuation sector)



Provide adequate analgesia. For better management of the burn wound, it is necessary to clearly divide the wounded into categories of pain.

At pain of insignificant and average intensity (small areas and depth of defeat) the wounded can continue fight, use meloxicam 15 mg 1 time a day.

The average pain in which the wounded person is conscious has a low chance of shock or loss of consciousness - to use a lozenge of fentanyl 800 mg.

Severe pain in which the wounded person is in a state of burn shock, has respiratory disorders or is at risk of their occurrence - ketamine 50 mg

intramuscularly or 20 mg slowly intravenously. Repeat the dose after 30 minutes for intravenous administration and after 20 minutes. for intravenous administration.

Features of providing home care for chemical burns.

Chemical burns occur as a result of exposure to the skin and mucous membranes of concentrated acids, alkalis, phosphorus. Some chemicals in the air, in contact with moisture or other chemicals can easily ignite or explode, causing thermochemical burns.

White phosphorus ignites spontaneously in the air, adheres easily to the skin and causes thermochemical burns. Gasoline, kerosene, turpentine, ethyl alcohol, ether are also often the cause of skin burns.

Chemical burns can be caused by some plants (yolk, datura, borage, etc.), especially during the flowering period of these plants.

Due to the timely and proper provision of home medical care to the victim at the scene, deep tissue damage and the development of general poisoning are eliminated or prevented.

Clothes impregnated with a chemical compound must be quickly removed, cut directly at the scene to the victim or others.

Chemicals should be washed off with plenty of running water for 30-40 minutes until the specific odor of the substance disappears, thus preventing its impact on body tissues and penetration into tissues.

Large visible particles of chemicals should be wiped as carefully as possible with a dry brush. Then the sequence of home care is the same as for thermal burns.

Neutralization of chemical burns (eg, alkali acids) should be avoided, as it is not always possible to adequately determine at the prehospital stage which chemical agent caused the burn.

- WARNING! Water is the best neutralizer !!!
- Never wipe the chemical agent with a damp cloth or damp cloth! This will cause it to penetrate deeper into the skin.
-
- Features of defeat by fighting fire mixes.
- Modern fire mixtures (Fig. 6), or as they are often mistakenly called "napalm" are divided into four main groups:
 - metallized mixtures (pyrogens);
 - napalm;
 - termite inflammatory fire mixtures;
 - self-igniting fire mixtures (varieties of ordinary and plasticized phosphorus).

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Fig. 6. Modern fire mixtures

The body of aircraft bombs in a collision with the target is destroyed by a special charge, and the substance in the form of hot particles flies to a distance of 100 meters or more, creating a continuous zone of fire and a large focus of damage. The combustion temperature can reach 1200 ° C.

The following striking factors act in the combustion zone: flame, thermal radiation (infrared radiation), high ambient temperature, toxic combustion products (smoke, carbon monoxide, phosphorus vapor, etc.). In addition, the use of such weapons causes mental demoralizing effects. Impressive factors act on the body simultaneously, leading to multifactorial (combined) burns: deep burns, respiratory damage (both heat and combustion products), carbon monoxide poisoning, general overheating, eye damage, mental disorders.

Deep burns usually result in deep burns, often in exposed areas of the body, with necrosis not only of the skin but also of deep-seated tissues (muscles, tendons, bones). At burns by napalm in 20-40 minutes. the victim develops severe swelling of the eyelids and temporary blindness.

Napalm causes combined burns, characterized by severe burns. The victims quickly develop severe intoxication, burn exhaustion. Rejection of dead tissue is slow, severe infectious processes in the burn wound, secondary anemia increases rapidly. Extensive keloid scars remain after healing of napalm burns.

Particular attention in this group of substances should be paid to white phosphorus.

Providing home care for injuries from combat fire mixtures.

Home care for victims of white phosphorus particles in the tissues consists of rinsing with plenty of water or applying bandages soaked in water, which must be constantly wet.

If possible, it is necessary to immerse the affected area in water, because in the absence of oxygen, the reaction temperature of phosphorus will drop sharply. The most common mistake is to cover the injured area with fatty solutions to prevent oxygen, because phosphorus is a fat-soluble compound and as a result of these actions it penetrates deeper into the tissues.

The main help will be the removal of phosphorus particles. To do this in the field, a steel knife is suitable to clean the wound surface by scraping. Avoid getting the substance on your hands.

Then the sequence of home care is the same as for thermal burns.

Functional and morphological changes in body tissues due to low temperatures are called frostbite (locally) or freezing (for the whole body). Frostbite and freezing in war are observed not only in winter but also in spring.

Frostbite is caused by: wind, wet and tight shoes, wet clothes, forced immobility, injuries and blood loss, fatigue and malnutrition, previously suffered frostbite.

There are three periods in the development of frostbite: latent (pre-reactive); period of tissue hypoxia; reactive (after heating the tissues).

In the pre-reactive period, the damaged areas of the body (ears, nose, fingers, toes) are white, cold to the touch, pain and tactile sensation is sharply reduced or absent.

After warming, the white color of the skin changes to bright redness or cyanosis. There are disturbances of sensation - anesthesia, hyperesthesia, various paresthesias.

A sign of the beginning of the reactive period, along with an increase in tissue temperature, is the appearance and increase of edema in areas of frostbite.

Local signs of tissue death appear only after 3-10 days.

According to the depth of tissue damage, there are four degrees of frostbite:

Frostbite of the I degree is characterized by reversibility of functional disturbances and morphological changes (fig. 7). In the pre-reactive period there is a feeling of tingling, numbness, loss of skin elasticity. After warming the skin becomes red or bluish, there is itching, pain, paresthesia, edema. All these phenomena are eliminated by the end of the week, but cyanosis, edema, pain persist for a long time - up to 10 days. Increased sensitivity to cold, which can persist for 2-3 months or more.



Fig.7. Frostbite of the I degree

Frostbite of the II degree. The condition in the pre-reactive period is similar to first-degree frostbite. During the reactive period, blisters are formed, filled with a clear, yellow-straw-colored liquid (Fig. 8).

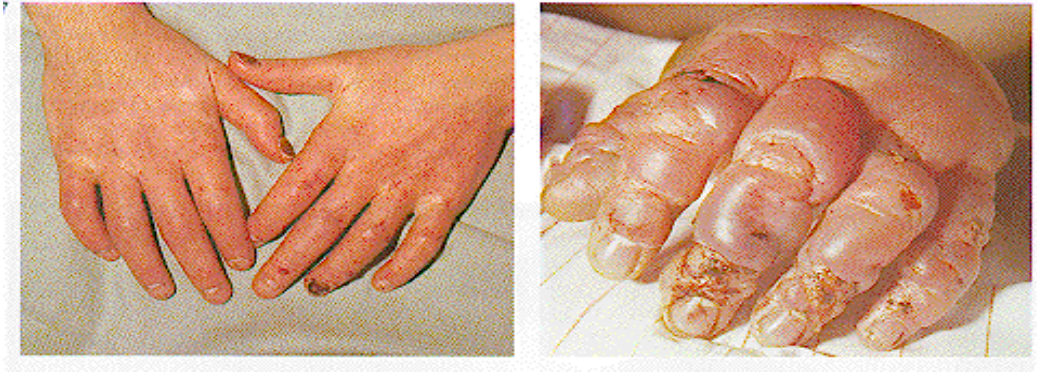


Fig.8. Frostbite of the II degree

Blisters tend to merge. The bottom of the blister forms a pink, sharply painful wound surface (germ layer of the epidermis). Healing of such a wound ends in 2-3 weeks, but cyanosis of the skin, immobility in the joints, hypersensitivity to cold can persist for 2-3 months or more.

Frostbite of the III degree. In the pre-reactive period there is pallor of the skin, numbness, loss of pain and tactile sensation. At frostbite of extremities - sharp disturbance of functions (fig. 9).



Fig.9. Frostbite of the III degree

The reactive period is characterized by the formation of blisters with blood contents, which fester in 5-6 days. There is a death of the skin and subcutaneous tissue, the fingers are rejected by the nails. With significant frostbite of the third degree, the wounds heal for a long time with secondary tension and the formation of rough scars.

Residual effects in the form of cyanosis of the skin, hypersensitivity to cold, pain, immobility in the joints last longer than after the second degree frostbite. Some of the consequences of third-degree frostbite include the development of venous outflow disorders, elephantiasis.

Frostbite IV degree. Necrosis covers all layers of tissues of the distal extremities (Fig. 10).



Fig.10. Frostbite IV degree

The clinical picture in the reactive period is manifested in two ways:

by type of dry necrosis, with the formation of blisters, when the dark blue areas of the skin, damaged fingers by the end of the 7-8th day immediately begin to turn black and dry;

by type of wet necrosis with frostbite of large segments of the extremities, with suppuration and severe intoxication, sepsis and exhaustion. The demarcation line is marked at the end of the 7-10th day after injury. Spontaneous rejection of the fingers can occur in 4-6 weeks.

The consequence of fourth-degree frostbite is always gangrene of the extremities.

Diagnosis of the degree of tissue damage is usually possible only for 7-10 days. The diagnosis is clarified by further dynamic monitoring of the local process during dressings.

„Trench foot "- one of the forms of frostbite that develops due to prolonged, at least 3-4 days, cooling of the limb in a humid environment. Its direct sign is pain in the joints of the feet, paresthesia, a pronounced violation of all kinds of sensations and limb function. The patient steps on his heels while walking. The skin of the feet is pale, waxy. Later, edema develops, covering the leg to the knee joint, forming blisters with blood. In severe cases, wet gangrene of the feet develops.

Freezing is a general pathological hypothermia of the body caused by a progressive drop in body temperature under the influence of the cooling action of the environment, when the protective thermoregulatory properties of the body are insufficient. At the heart of freezing is a violation of thermoregulation of the body. General hypothermia causes a decrease in all types of metabolism, resulting in conditions in which heat transfer significantly exceeds heat generation.

In the clinical course of freezing there are three phases:

Adynamic phase - light damage. The victim is lethargic, apathetic, and wants to fall asleep. The skin is pale, the limbs are bluish or have a marble color,

"goosebumps". Pulse is slowed, blood pressure is elevated, respiration is within normal limits, body temperature is reduced to 34-35 ° C.

Stuporous phase - moderate damage. Body temperature is reduced to 31-32 ° C, there is lethargy, chills, limbs pale, cold to the touch. Pulse filiform, difficult to determine, blood pressure slightly elevated or decreased, infrequent breathing, 8-10 per minute.

Convulsive phase - severe damage. Body temperature is below 30 ° C, consciousness is lost, convulsions, vomiting are noted. Pulse is determined only in the carotid artery, blood pressure is low, breathing is infrequent. Complications that are life-threatening for the patient (swelling of the brain and lungs, hemorrhage into tissues and organs) join. Death can occur when the temperature in the rectum drops to 25 ° C

Prevention and provision of home care for frostbite and frostbite

With the help of a rational set of preventive measures, it is possible to prevent frostbite or significantly reduce their frequency. This requires joint efforts of the command, rear services and military medical service. The junior command staff - commanders of companies, platoons, divisions, company commanders - plays a particularly important role.

Proper selection of uniforms and shoes is the main thing in the prevention of frostbite. Parts and ships must be equipped with special dryers for grandchildren, socks, wet clothes, shoes (you can not dry shoes over an open fire, because it hardens). To prevent cold injuries, troops must regularly eat (at least twice a day) hot food.

In frosty weather on the march it is necessary to periodically change the soldiers moving in front of the column or on its flanks. In case of transportation of personnel on unequipped cars, it is necessary to sit with a back to the direction of movement and to be covered with a tarpaulin, a cloth of tents. When placing personnel in the field, you should choose dry and sheltered from the wind places, arrange snow fences, etc. When landing troops, it is necessary to provide servicemen with waterproof clothing and footwear, and to change and dry wet clothes and shoes.

An effective home remedy for frostbite and freezing is the fastest normalization of the temperature of the supercooled areas, the whole body and the restoration of blood circulation in them.

To do this, first of all, it is necessary to stop the cooling effect of the environment with any available measures: warmly wrap the victim, give him hot drinks, change wet clothes and shoes, move the victim to a warm room. If the ears, the tip of the nose and the cheeks are frozen, they should be treated with alcohol and lubricated with sterile Vaseline oil or any fat-based antiseptic ointment.

The frostbitten limb can be insulated by applying a gray cotton bandage. The limb should be kept in a bandage until it is warmed and the victim is placed in a warm room. Warming of the limb indoors can be achieved by immersing it in warm water (37-38 ° C).

It is strictly forbidden to rub frostbitten areas with snow, warm near the stove and hearth, as this gives the worst long-term results, increasing the complexity of the damage (scratching with pieces of ice, local overheating of the skin, etc.).

Hyperthermia

Hyperthermia is a pathological condition of the body that occurs due to a violation of thermoregulation and / or the action of external heat.

When exposed to high ambient temperatures against the background of physical activity, servicemen may experience: heat convulsions, thermal fatigue, heat stroke.

At a hyperthermia it is necessary to distinguish the following signs:

1) heat cramps - painful muscle contractions (most often in the legs or muscles of the anterior abdominal wall);

2) thermal fatigue - normal or elevated body temperature, cool, moist, pale or reddened skin, headache, nausea, dizziness or weakness;

3) heat stroke: high body temperature, sometimes reaching 41 ° C, red, hot dry skin, irritability, loss of consciousness, rapid shallow breathing.

Providing home care to victims of hyperthermia

The sequence of actions in providing home care to victims of hyperthermia by non-medical workers:

1) in case of heat cramps:

move the victim to a cool place;

give the victim to drink cool water;

if possible, gently massage the muscles on the spot with a court;

2) with thermal fatigue and heat stroke:

move the victim to a cool place;

give the victim to drink cool water;

unbutton the victim's clothes;

place moist, cool compresses in the area of large vessels (lateral surface of the neck, axillary areas) and on the forehead;

for the purpose of the general cooling it is possible to use fans, wiping of the victim with cool compresses. The victim should not be cooled completely by immersing him in water;

3) provide constant supervision over the victim before the evacuation;

4) in case of deterioration of the victim's condition before evacuation, provide intravenous access and start infusion therapy with cool solutions.

Features of electric shock. Providing home care for electric shock

Undermining of power lines is increasingly used in combat operations, so knowledge of this type of burns is also relevant.

High voltage electrical voltage (> 1000 volts) causes damage to deep tissues and muscles. These injuries are not extensive, but deep.

The first step in home care is to disconnect the network or remove the victim from the affected area.

Assess the condition of the victim and provide the necessary home care according to the SAVS algorithm. The possibility of deep muscle damage with

subsequent rhabdomyolysis and hyperkalemia, acute renal failure and compartment syndrome should be considered.

At poisonings by acids, alkalis, salts of heavy metals the victim is given to drink enveloping means. These are jelly, aqueous suspension of flour or starch, vegetable oil, beaten in boiled cold water egg whites (2-3 proteins per 1 liter of water). They partially neutralize alkalis and acids, and with salts form insoluble compounds. At the subsequent washing of a stomach through a probe use the same means.

A very good effect is obtained by injecting activated charcoal into the stomach of a poisoned person. Activated carbon has a high sorption (absorbing) ability to many toxic substances. The victim is given it at the rate of 1 tablet per 10 kg of body weight or prepare a coal suspension at the rate of 1 tablespoon of coal powder per glass of water. But we must remember that sorption on coal is not strong, if it stays in the stomach or intestines for a long time, the toxic substance can be released from the microscopic pores of activated carbon and begin to be absorbed into the blood. Therefore, after taking activated charcoal, it is necessary to introduce a laxative. Sometimes in first aid activated charcoal is given before gastric lavage, and then after this procedure.

Despite gastric lavage, some of the poison can enter the small intestine and be absorbed there. Salt laxatives (magnesium sulfate - magnesium) are used to accelerate the passage of the poison through the gastrointestinal tract and thus limit its absorption, which is better to enter through a tube after gastric lavage. When poisoning with fat-soluble poisons (gasoline, kerosene) use Vaseline oil for this purpose.

To remove the poison from the large intestine in all cases, cleansing enemas are indicated. The main liquid for washing the intestines is clean water.

Implementation of methods to accelerate the excretion of absorbed venom requires the use of special equipment and trained personnel, so they are used only in a specialized department of the hospital.

Antidotes are used by medical personnel of the ambulance or toxicology department of the hospital only after determining the poison with which the victim was poisoned.

Children are poisoned mostly at home, this should be remembered by all adults!

First aid for eye burns should be provided on the spot; further hospitalization of the victim in an ophthalmological hospital is necessary.

Emergency remedies for eye burns are copious jet lavage of the conjunctival cavity with saline or water. Self-use of neutralizing solutions is not recommended due to the possible unpredictable effects of reaction products on damaged tissues. In the first hours after a burn of an eye Washing of lacrimal ways, removal of the introduced foreign bodies from a conjunctiva and a cornea is carried out. Drops or ointments of local anesthetic action are buried in the conjunctival cavity. The introduction of anti-tetanus serum to the victim is shown.

In the hospital, patients with eye burns are prescribed instillation into the eye of cytoplegic drugs (atropine, scopolamine): they reduce pain and the likelihood of adhesions. In order to prevent infection, eye ointments and drops containing antibiotics (tetracycline, chloramphenicol, ciprofloxacin), NSAIDs are used. In case of eye burns, it is advisable to use tear fluid substitutes. Intramuscular and parabolbar injections of antioxidants (methylethylpyridinol) are prescribed. To stimulate corneal regeneration, eye gels (actovegin, solcoseril or dexpanthenol) are applied over the eyelid. At the raised IOP local antihypertensive drugs (betaxolol, timolol, dorzolamide) are appointed. In severe cases of eye burns shown the use of glucocorticoids (dexamethasone, betamethasone, etc.) in the form of parabolbar or subconjunctival injections.

Of the non-drug techniques for eye burns used physiotherapy and eyelid massage.

Surgical tactics for eye burns are very variable and are determined by the nature and extent of damage to eye tissues. When chemical reagents enter the anterior chamber of the eye, it is necessary to perform paracentesis of the cornea and remove penetrants.

At threat of loss of an eye in early terms after a burn of an eye surgical interventions on eyelids or eyeballs - a necrectomy of a conjunctiva and a cornea, a vitrectomy, plastic of a conjunctival cavity, early keratoplasty, etc. can be carried out.

In the future it may be necessary to perform plastic surgery on the eyelids - correction of torsion or inversion of the eyelid, elimination of ptosis, eyelash restoration in trichiasis, surgical treatment of post-burn cataracts, etc. In the formation of corneal scars in the delayed period .

Materials for self-control:

TESTS:

1. As a result of a long stay on the street in winter, the victim N., 30 years old, has a tingling sensation on his hands, numbness, loss of skin elasticity. After warming the skin became cyanotic, there was pain, swelling. What is the degree of frostbite?

1. * I
2. II
3. III

4. IIIA

5. IY

2. The victim S., 40 years old, worked in the open for a long time in winter. During the examination it was found: blisters on the fingers, filled with a clear, yellow-straw liquid, sharply painful wound surface. What are the first aid measures?

1. * apply a thermal insulation bandage

2. rub with snow

3. Immerse your hands in hot water

4. pierce blisters, apply a bandage

5. immobilize the limb

3. As a result of the fire in a woman P, 55 years old, the posterior surface of the right lower limb and back were damaged. Determine the area of the burn surface.

1. * 27%

2. 9%

3. 18%

4. 36%

5. 45%

4. Determine the degree of burns, if clinically there is redness of the skin, swelling, pain.

1. II degree

2. * I degree

3. IIIa degree

4. IIIb degree

5. IY degree

5. How many degrees of frostbite are distinguished:

1. 3 degrees

2. * 4 degrees

3. 5 degrees

4. 2 degrees

5. 6 degrees

6. Determine the degree of burns, if clinically there is severe pain, redness, exfoliation of the epidermis with the formation of bubbles filled with clear fluid.

1. * II degree

2. I degree

3. IIIa degree

4. IIIb degree

5. IY degree

7. Determine the degree of burns if there is necrosis of the surface layers of the skin with partial damage to the germinal and basal layers of the skin.

1. II degree

2. I degree

3. * IIIa degree

4. IIIb degree

5. IY degree

8. Determine the degree of burns if there is necrosis of the entire skin (with damage to the epidermis and dermis).

1. II degree
2. I degree
3. IIIa degree
4. * IIIb degree
5. IV degree

9. Determining the area of burns by the method of nine in adults assumes that:

1. * scalp and neck is 9%, arms 9%, each leg 18%, anterior and posterior torso 18%, perineum 1%
2. the skin of the head and neck is 9%, arms 9%, each leg 9%, front and back of the torso 18%, perineum 1%
3. the skin of the head and neck is 18%, arms 9%, each leg 18%, front and back of the torso 9%, perineum 1%
4. the skin of the head and neck is 9%, arms 9%, each leg 18%, front and back of the torso 9%, perineum 1%
5. the skin of the head and neck is 9%, arms 9%, each leg 9%, front and back of the torso 9%, crotch 9%

10. Determine the degree of burns if there is necrosis of the skin and deeper tissues.

1. II degree
2. I degree
3. IIIa degree
4. IIIb degree
5. * IV degree

Literature

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