Topic 2.11. First Aid/ Тема 2.11. Оказание первой помощи

First aid is the immediate assistance given to a person who has suffered an injury or sudden illness before the arrival of qualified medical personnel. The main goal of first aid is to preserve life, prevent the condition from worsening, and promote recovery. Timely and correct first aid can significantly reduce the risk of complications, disability, and death. Every person, regardless of their profession, should possess basic first-aid skills, but for healthcare workers and professionals in related fields, this knowledge is especially critical.

The general algorithm of first aid includes the following steps: assess the situation and ensure safety for oneself and the casualty; check the level of consciousness and vital signs (breathing, pulse); call for emergency medical services; and provide appropriate assistance depending on the type of injury or illness. The rescuer must remain calm, act quickly and systematically, and avoid actions that could worsen the victim's condition. It is essential to remember the principle "do no harm" — incorrect interventions may cause additional injury.

Bleeding and its management. Bleeding is the loss of blood from the circulatory system. Depending on the source, bleeding is classified as arterial, venous, and capillary. Arterial bleeding is the most dangerous: bright red blood spurts in pulsating jets. It can lead to fatal blood loss within minutes. To control arterial bleeding, a tourniquet must be applied above the wound, as close to the bleeding site as possible. The tourniquet should not remain in place for more than 1 hour in summer and 30 minutes in winter; the exact time of application must be recorded and indicated on a note attached to the tourniquet.

Venous bleeding is characterised by a steady flow of dark red blood. It can usually be controlled by applying a sterile pressure dressing and elevating the injured limb. Capillary bleeding presents as slow oozing from the wound surface and is typically managed by applying a sterile dressing with moderate pressure.

Wounds. A wound is a breach in the continuity of the skin or mucous membranes. Wounds are classified as incised, lacerated, puncture, avulsion, and gunshot. The main dangers associated with wounds are bleeding, infection, and damage to underlying structures (nerves, blood vessels, tendons, bones). First aid for wounds includes: stopping the bleeding, applying a sterile dressing, immobilising the injured area if a fracture is suspected, and transporting the victim to a medical facility. Foreign objects embedded in a wound should not be removed at the scene, as removal may provoke severe bleeding or deepen tissue damage.

Burns. Burns are injuries to the skin and deeper tissues caused by heat, chemicals, electricity, or radiation. Thermal burns are classified by depth into four degrees. First-degree burns involve redness and pain of the superficial skin layer (epidermis). Second-degree burns are characterised by blister formation. Third-degree burns involve full-thickness destruction of the skin. Fourth-degree burns extend into subcutaneous fat, muscle, and bone.

First aid for thermal burns: cool the burn surface with running water for 10–20 minutes (do not use ice, oil, butter, toothpaste, or any home remedies); apply a sterile non-stick dressing; administer pain relief if available; and seek medical attention for burns larger than the victim's palm, all third- and fourth-degree burns, and burns involving the face, hands, feet, groin, or major joints. Chemical burns require immediate, prolonged flushing of the affected area with copious amounts of water to remove the corrosive substance, followed by medical evaluation.

Fractures. A fracture is a break in the continuity of a bone. Fractures are classified as closed (the skin remains intact) and open (the bone fragment is exposed through a wound). Open fractures

carry a high risk of infection and are associated with significant bleeding. The primary signs of a fracture include pain, swelling, deformity, abnormal mobility, and crepitus (a grating sound or sensation).

First aid for fractures: immobilise the injured limb using splints or available materials (boards, sticks, rigid objects). The splint must fix the joints above and below the fracture site. For open fractures, bleeding must be controlled first with a sterile dressing, followed by splinting. The victim should be transported in a supine position, especially if a spinal or pelvic fracture is suspected. Under no circumstances should the rescuer attempt to realign the bone fragments.

Fainting and loss of consciousness. Fainting (syncope) is a brief loss of consciousness caused by a temporary reduction in blood flow to the brain. First aid: lay the victim flat on their back and elevate the legs 15–20 cm above the level of the heart; loosen tight clothing; ensure fresh air supply; and do not pour cold water on the victim or slap their face. If the victim does not regain consciousness within 2–3 minutes, emergency medical services must be called, as this may indicate a more serious condition.

In cases of prolonged loss of consciousness, the rescuer must check breathing and pulse. If the victim is breathing, they should be placed in the recovery position (lateral position) to prevent the tongue from falling back and blocking the airway and to prevent aspiration of vomit.

Basic cardiopulmonary resuscitation (CPR). Cardiac arrest is the sudden cessation of cardiac function, resulting in the absence of blood circulation. Without immediate intervention, irreversible brain damage begins within 4–6 minutes. The signs of cardiac arrest include unconsciousness, absence of breathing (or only gasping), and absence of a central pulse (carotid artery).

CPR is performed in the following sequence:

1. Ensure safety. Assess the victim's responsiveness by shaking the shoulders and shouting.
2. Call for emergency medical services. If a second rescuer or bystander is present, instruct them to call immediately and bring an automated external defibrillator (AED) if available.
3. Check for normal breathing for no more than 10 seconds.
4. Begin chest compressions. Place the heel of one hand on the centre of the victim's chest (lower half of the sternum), place the other hand on top, and compress to a depth of 5–6 cm at a rate of 100–120 compressions per minute.
5. After 30 compressions, give 2 rescue breaths (mouth-to-mouth ventilation), ensuring visible chest rise.
6. Continue the cycle of 30:2 until the victim shows signs of life, qualified help arrives, an AED becomes available, or the rescuer is exhausted.

If the rescuer is untrained or unwilling to perform mouth-to-mouth ventilation, compression-only CPR (continuous chest compressions without rescue breaths) is recommended, as any CPR is better than none.

Frostbite and hypothermia. Frostbite is tissue damage caused by exposure to freezing temperatures. The extremities (fingers, toes, ears, nose) are most commonly affected. Symptoms include numbness, pale or waxy skin, and loss of sensation. First aid: move the victim to a warm place, remove wet and constrictive clothing, and gradually warm the affected area with body heat or warm (not hot) water at 36–40 °C. Rubbing the frostbitten area, applying dry heat, or massaging the frozen tissue is strictly prohibited, as it causes further tissue damage. Severe cases require urgent medical treatment.

Heat stroke. Heat stroke occurs when the body's thermoregulation fails due to prolonged exposure to high temperatures. Symptoms include high body temperature (above 40 °C), hot and dry skin, rapid pulse, headache, dizziness, confusion, and loss of consciousness. First aid: move the victim to a cool, shaded place; remove excess clothing; cool the body with water, wet cloths, or fans; and seek medical help immediately, as heat stroke is a life-threatening condition.

Electric shock. Electric shock can cause burns, cardiac arrest, muscle spasms, and internal injuries. First aid: disconnect the power source before touching the victim. If this is not possible, use a non-conductive object (dry wood, rubber, plastic) to separate the victim from the electrical source. Once the victim is free from the current, assess vital signs and begin CPR if necessary. All victims of electric shock require medical evaluation, even if they appear uninjured, as cardiac arrhythmias may develop later.

Choking (foreign body airway obstruction). Choking occurs when a foreign object blocks the airway, preventing breathing. If the victim is conscious and can cough, encourage them to continue coughing. If the airway is severely obstructed and the victim cannot breathe, speak, or cough, perform the Heimlich manoeuvre (abdominal thrusts): stand behind the victim, place one fist above the navel, grasp the fist with the other hand, and deliver sharp inward and upward thrusts until the object is expelled. For an unconscious victim, begin CPR immediately.

Snake bites and insect stings. For snake bites, first aid includes: keeping the victim calm and still to slow venom absorption; immobilising the bitten limb at or below heart level; removing rings, watches, and tight clothing near the bite (swelling may occur); and seeking medical help promptly. Incision of the bite site, suction of venom, application of a tourniquet, or ingestion of alcohol is strictly contraindicated. For bee and wasp stings, the stinger (if present) should be scraped off with a flat object, the area washed with soap and water, and a cold compress applied. In cases of allergic reactions (anaphylaxis) — difficulty breathing, swelling of the face or throat, rapid pulse — emergency medical services must be called immediately.

Transportation of the injured. Proper transportation is a critical component of first aid. The method of transport depends on the type and severity of injury, the distance to a medical facility, and available resources. For suspected spinal injuries, the victim must be transported on a rigid surface (spine board) with the head and neck immobilised. For limb fractures, the injured limb must be splinted before transport. In mass casualty situations, the most severely injured are evacuated first (triage principle).