1. FIRST AID BASIC CRITERIA AND EQUIPMENT

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1.1. INTRODUCTION

In compliance of the International Law, Constitution of the Russian Federation and Federal Law No 323 of 21.11.2011 (as amended on 25.06.2012) "On Fundamental Healthcare Principles in the Russian Federation" (art. 18), everyone is eligible for healthcare and medical treatment. These right becomes especially important in emergency situations (ES) taking place at peace-time and at war-time.

In case of accidents, catastrophes and natural disasters a considerable number of the casualties can need first aid which must be given immediately after the injury or poisoning. Experience in liquidation of the consequences of numerous catastrophes and natural disasters demonstrates that during the first and the most important for the lifesaving moments there might happen to be neither rescue nor medical teams at hand or their number might be insufficient to provide necessary help to all the victims. Under such circumstances the cardinal and quite often the only chance to save the victim's life is **first aid given in a form of self-care or peer-rescue**.

The article 19 of the Federal Law No 68-FZ of 12.12.1994 "On Protection of Population and Territories from Natural and Technological Emergencies" reads: "Citizen of the Russian Federation is obliged to study principle methods of protection of the population and territories from emergency situations, to learn techniques of first aid giving and guidelines regarding the usage of the personal and communal protective equipment and permanently upgrade his skills and knowledge in the above mentioned fields".

Elementary first aid procedures, performed before the medical personnel arrive, can save life and sustain the victim's health in accident or sudden illness.

This is why to learn the techniques of first aid is a state duty for everyone.

1.2. DEFINITION AND THE LIST OF FIRST AID PROCEDURES

First aid is a set of urgent, basic procedures undertaken to recuperate or sustain the victim's life and health performed at the site of disaster, predominantly in a form of self-care or peer-rescue, as well as that provided by the rescue teams using standard equipment or materials at hand.

The lists of conditions and recommended first aid procedures were adopted by the Ministry of Health and Social Development of the Russian Federation order No 477n of 04.05.2012 (as amended on 07.11.2012) "On Approval of the List of Conditions Requiring First Aid and the List of First Aid Procedures".

List of conditions.

1. Unconsciousness.
2. Pulmonary arrest and circulatory failure.
3. External bleedings.
4. Foreign bodies in upper respiratory airway.
5. Injuries to different parts of the body.
6. Burns, after-effects of high temperatures and heat irradiation.
7. Frostbiting and other after-effects of the exposure to low temperatures.
8. Poisoning.

First aid procedures include the following.

1. Evaluation of the actual situation and arrangement for first aid safe conditions:
   1) recognizing the factors threatening own life and health;
   2) recognizing the factors threatening the victim's life and health;
   3) eliminating the factors threatening life and health;
   4) terminating the damaging factors impact on the victim;
   5) estimating the victims number;
   6) taking the victims out of the transport vehicle or other inaccessible places;
   7) moving the victim.
2. Calling for emergency medical service and other services obliged to provide first aid according to the Federal law or special regulation.
3. The victim's consciousness state assessment.
4. Procedures performed for the victim's airway management and the vital signs detection:

1) tilting head with the chin lifting;
2) jaw thrust;
3) checking for respiration by way of listening, visual inspection and tactile sensation;
4) checking for circulation, checking for pulse on the main arteries.

5. Cardio-pulmonary resuscitation procedures to be performed until the vital signs are detected:
   1) manual compression of the victim's chest;
   2) artificial ventilation "mouth to mouth";
   3) artificial ventilation "mouth to nose";
   4) ventilation involving artificial respiration unit.
6. Sustaining the victim's airways patency:
   1) arranging for stable lateral (recovery) position;
   2) tilting the head with the chin lifting;
   3) jaw thrust.
7. Visual inspection of the victim and temporary control of the external bleeding:
   1) visual inspection of the victim for any bleedings;
   2) direct manual pressure of the artery;
   3) tourniquet application;
   4) ultimate bending of the limb in a joint;
   5) direct manual pressure on the wound;
   6) compressing bandage application.
8. The victim's careful examination to detect the signs of any injuries, poisoning or other life and health threatening conditions, and provision of first aid in case such conditions may be detected:
   1) head examination;
   2) neck examination;
   3) chest examination;
   4) back examination;
   5) abdomen and pelvis examination;
   6) limbs examination;
   7) bandages application in case of injuries to different body areas, including an occlusive (sealing) one in case of chest wound;
   8) immobilization (using makeshift means, anatomic splints, medical equipment);
   9) cervical-spine stabilization (manually, using makeshift means, or medical equipment);

10) termination of the harmful chemicals impact on the victim (clearing his stomach by extra water drinking and causing him to vomit, removing from damaged surface and rinsing the injured surface with flashing water);
11) local cooling in case of traumas, thermal injuries and other impacts of high temperatures or thermal irradiation;
12) thermal insulation in case of frostbites and other aftereffects of the low temperatures.

9. Setting the victim to the possibly optimal position.
10. Monitoring the victim's condition (consciousness, respiration, circulation) and giving psychological support.
11. Handling the victim to the medical emergency team, or other special services obliged to provide first aid according to the Federal law or special regulation.

Aim of First Aid:

- eliminate further impact of the affective factor;
- eliminate consequences of the impact threatening the victim's life;
- prevent life-threatening complications.

One of the most important points of first aid is its urgency: the sooner it is provided the more favorable outcome is expected. That is why such aid can and must be provided by the person who happens to be near the victim.

The best period for first aid is the first 50–60 minutes after injury. However, some conditions (respiratory insufficiency or cardiac failure, severe external bleeding) shorten this time significantly. The importance of time factor is supported by the point that the persons receiving first aid within 60 minutes after the injury suffer from complications twice as little than those who get help later. In such cases one hour of aid delay increases the number of lethal outcomes by 30%, up to three hours delay — by 60% and up to 6 hours — by 90%.

First Aider Must Know:

- general signs of the humane organism vital functions disturbances;
- general principles, rules and techniques of first aid applicable to the particular injury specifics;
- general methods of the victims manual transportation and evacuation.

Signs which help to quickly assess the victim's condition:

a) consciousness: clear, absent or disturbed;
b) respiration: regular, absent or disturbed;
c) carotid pulse: palpable (regular or irregular rhythm) or absent;
d) pupils: narrow (miotic) or wide (mydriatic).

With certain rate of competence and skills the first aider can quickly assess the victim's condition and make decision upon the treatment priorities and extent.

1.3. GENERAL PRINCIPLES AND RULES OF FIRST AID

General principles of first aid reflect the most important requirements which should be taken in consideration when rendering first aid in different situations:

- first aid procedures must follow from the actual circumstances;
- scope of first aid procedures should depend on the circumstances of impact and affecting factors influencing the population;
- ability to apply makeshift means for giving any possible first aid;
- first aid should be provided alongside with the preparation for evacuation;
- constant monitoring of the victims condition before and during their evacuation to the health facility;
- first-aiders safety.

General principles and rules of first aid complement each other and determinate the sequence of procedures. To deliver the proper first aid it is important to quickly and correctly assess the situation and the victim's condition as well as to keep in mind the following **rules**.

1. The first aider himself must be protected from any damage (hazardous chemicals, toxic combustion, electricity, HIV-infections; and chemical agents poisoning, radioactive materials, bacteriological warfare agents in war-time).
2. Readiness to provide first aid without medical equipment, ability to use any materials at hand.
3. Ability to act quickly and reasonably (according to the situation) without any fluster or fuss.
4. Involving the bystanders in the assistance (make a call to the medical emergency unit, find means of help, or find transport, handling and transportation).
5. Knowledge, experience and skills.

Sequence of First Aid Procedures.

1. Stop the affecting factors impact (fire, gases, electricity, compression, drowning etc.).
2. Arrange for the scene safety taking care about own security; use any available means of protection.
3. Make quick evaluation of the situation (cause of the accident, circumstances and the time of accident, witnesses).

4. Check if the victim is conscious (reacting, replying), ask the victim what happened and where the injury is.
5. If the victim is unconscious — look for the vital signs (pulse, respiration, and pupil).
6. If the victim shows vital signs being unconscious — escape leaving him in dorsal position (vomiting, tongue retraction), turn him sideward (rescue position), monitor pulse and respiration every 1–2 minute and never leave the victim alone.
7. With no vital signs (pulse, respiration) start resuscitation (consider: pulse and respiration can be weak and shallow, though unassisted). Prior to resuscitation clear the airways, loosen the tight clothing.
8. If pulse and respiration are detectable — estimate the character of the injury (signs of bleeding, fractures, poisoning etc.).
9. Chose the method of first aid (what the victim needs).
10. Specify what is required first and arrange for finding these means (tourniquet, splint, dressing material).
11. Give first aid to the victim.
12. Prepare the victim for transportation to the health facility.

In any case, giving first aid requires extra caution to protect the victim from further injury. Do not replace or handle him without any sharp necessity to avoid pain shock. At the same time, it is necessary to monitor the victim's pulse, respiration and pupils, and never leave him alone. It may be helpful to involve any available bystanders in the first aid activities and always call for the medical emergency team.

First aid **in the areas of large-scale losses** has particular specifics and depends on the particularities of the situation. Conventionally we can count three phases (periods) corresponding to the phases of the emergency unrolling.

- **Isolation Phase** — begins with the disaster outbreak and lasts until the organized recovery operation starts.
- **Rescue Phase —** continues from the start of the recovery operation until the evacuation of the casualties from the area is completed.
- **Recovery Phase** presumes conventional treatment and further medical rehabilitation of the victims (injured).

In isolation period, when the persons caught in the area of disaster eventually stay by themselves, the first aid availability becomes particularly vital. Bearing in mind unpredictable duration of this phase, which can last from the minutes to several days, all the population must be preliminary instructed about elementary rules of behavior in emergency as well as trained to provide first aid in a form of self- and mutual rescue.

1.4. SCOPE OF FIST AID MEASURES AT DIFFERENT KINDS OF INJURY

Particular measures of first aid depend on the impact factors affecting the victim, and on the received injuries and specifics of the situation.

In Case of Catastrophes with Prevailing Mechanical (Dynamic) Affecting Factors the First Aider Must Arrange for the Following:

- remove the victims from under the ruins, destroyed shelters, or protective constructions;
- make sure, if the victim is alive;
- set the victim in physiologically comfortable position (in case of tongue retraction, vomiting, or severe nose-bleeding);
- clear the blocked airways (remove any foreign subjects from the mouth — like broken teeth, mucus, blood clots, ground etc.) and make rescue breathing "mouth — to mouth" or "mouth — to nose";
- perform external chest compression;
- arrange for temporary control of external bleeding applying any available means (compression bandage, direct manual pressing of the great vessel above the wound, tourniquet or cloth tourniquet made from the materials at hand);
- put aseptic dressing on the wound or burn surface and occlusive (tight) dressing made from sterile rubber-coated inner cover of the **individual dressing wrapper** in case of penetrating chest wounds;
- immobilize the limbs in case of fracture and crushing injury;
- fix the body to the board or plank in case of spinal injuries;
- provide much warm drinking (if there is no vomiting or suspicion on the abdominal injury) adding a tea-spoon of baking soda and tea-spoon of salt per one liter of liquid.

In the Areas with Prevailing Thermal Impact Factor.

In addition to the above-mentioned measures, the following is required:

- extinguish burning clothing and take any burning substances off the body;
- wrap the injured with the clean bed-sheet;
- warm up the victim.

In Case of Disasters and Accidents Accompanied by Environmental Contamination with Hazardous Chemicals, the Following First Aid Measures Are Required:

- put gas mask and skin-protecting means on the victim located in the contaminated area;

- remove the victim out of the area of poisoning;
- administering antidotes with preventive and curative aims (in case of poisoning);
- in case the hazardous chemicals get into the stomach, arrange for extra drinking with further stomach lavage and administer adsorbents;
- perform initial cleaning of the open skin surfaces with the flowing water with soap, 2% solution of baking soda;
- perform spot decontamination of the outfit near the open skin surfaces using individual decontamination set;
- arrange for transporting to the hospital.

1.5. FIRST AID EQUIPMENT

Performing first aid procedures the first-aiders operate both **standard equipment and makeshift means**.

- STANDARD — medications and medical equipment available for giving aid to the population and rescue workers suffering different affecting factors impact.
- MAKESHIFT MEANS — any materials that can appear suitable for giving first aid (belt, necktie, tie string — for bleeding control; plank, plywood — for fractures stabilization; clean piece of cloth, handkerchief — for wound dressing etc.)

Requirements to the standard equipment and makeshift means used for first aid:

- easy to use;
- easily kept by the population;
- effective in action;
- excluding adverse consequences in application.

Widely applied first aid devices are **medical means of individual protection**. They include:

- various first aid kits containing sets of medicaments for treatment and prevention of affections;
- first-aid pack (roller bandage 4 inches wide) for wound dressing;
- means of simple decontamination.

Alongside with the above mentioned the following items are used for first aid:

- tourniquets of different modifications for bleeding control;
- splints and other devices for immobilization of bone fractures;
- roller bandages and dressings of different size.

Individual Medical Kit. Personnel of emergency rescue teams are equipped with different type of medical kits and bags for first aid. They include:

- first aid kit for individual use;
- first aid kit for collective use;
- first aid motor-vehicle kit.

Individual First-Aid Pack

Contents: paper wrapped sterile dressing, i.e. 7 meters of 10 cm wide bandage and two 17×32 cm cotton gauze pads. The pads consist of three layers: atraumatic, adsorbing, moisture proof. Another three brands of individual first aid pack are available including ACM-4 (Atraumatic Carbon-containing Moisture Proof — 4 Layer) suitable for long-term dressings (up to three days) without risk of infection. Individual first-aid packs are currently available in a variety of sizes, but all of them serve as wound dressing.

Individual Decontamination Set

It is appropriate for initial cleaning of the open skin areas and contiguous clothing in case of their contamination with the toxic matters.

Contents of **IDS-8** — decontaminant mixture, cotton gauze pads reliably neutralizing the toxic matters fallen on the skin and clothing.

Contents of **IDS-11**: polymer cover, unwoven textile pad, "Langlique" solution.

Tourniquets for Bleeding Control:

- elastic tourniquet;
- rubber tourniquet;
- elastic-cloth tourniquet.

Immobilizing Splints for Limbs Bone Fractures:

- Diterichs splints;
- pneumatic and vacuum splints (soft and rigid);
- transport splints (wire, plywood).

Giving first aid seems to be extremely important and sophisticated activity requiring deep self-control, willpower, knowledge and skills from the first-aider. The situation can put him under negative moral and psychological pressure. In this connection, the first-aider must have necessary knowledge, practical skills and keep general situation under control involving the bystanders in assistance.

Key Questions for Self-Check

1. Definition and list of the first aid measures.
2. List of conditions presuming first aid.
3. General rules of first aid.
4. General principles of first aid.
5. Scope of the first aid measures for trauma.
6. Scope of the first aid measures for thermal injuries.
7. Scope of the first aid measures for poisoning.
8. Means of first aid for wounds.
9. Means of first aid for bleedings.
10. Means of first aid for bone fractures.