

ПРОБЛЕМНЫЕ ВОПРОСЫ МЕДИЦИНСКОЙ СОРТИРОВКИ ПОРАЖЕННЫХ
ПРИ ТЕРРОРИСТИЧЕСКИХ АКТАХ*

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Резюме. Цель исследования – разработать предложения по совершенствованию методических подходов к организации и выполнению медицинской сортировки пораженных в зоне террористического акта, совершенного с применением обычных средств поражения.

Материалы и методы исследования. Материал исследования: нормативные и методические документы, регламентирующие порядок организации и проведения медицинской сортировки пораженных в чрезвычайных ситуациях (ЧС), в том числе при террористических актах; данные карт экспертной оценки по теме исследования; научные работы и публикации, посвященные вопросам медицинской сортировки пораженных в чрезвычайных ситуациях.

При выполнении исследования применялись следующие научные методы: методы контент-анализа и экспертной оценки, статистический метод, метод логического и информационного моделирования, аналитический метод.

Результаты исследования и их анализ. Представлены результаты исследования, характеризующие состояние проблемных вопросов организации и проведения медицинской сортировки пораженных при террористических актах.

Внесены обоснованные предложения по совершенствованию методических подходов к порядку организации и выполнения медицинской сортировки и выделения сортировочных групп пораженных в зоне террористического акта.

Ключевые слова: зона террористического акта, лечебные медицинские организации, лечебно-эвакуационное обеспечение, медицина катастроф, медицинская сортировка, медицинская эвакуация, методические подходы, обычные средства поражения, пораженные, скорая медицинская помощь, скорая специализированная медицинская помощь, Служба медицины катастроф, террористические акты, чрезвычайные ситуации

Конфликт интересов. Авторы статьи подтверждают отсутствие конфликта интересов

Для цитирования: Титов И.Г., Гончаров С.Ф., Бобий Б.В., Акиншин А.В. Проблемные вопросы медицинской сортировки при террористических актах // Медицина катастроф. 2022. №3. С. 5-11. <https://doi.org/10.33266/2070-1004-2022-3-5-11>

ISSUES OF MEDICAL TRIAGE OF THE WOUNDED IN ACTS OF TERRORISM*

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Summary. The aim of the study is to develop proposals to improve methodological approaches to the organization and performance of medical triage of the injured in terrorists attack committed with conventional means of destruction.

Materials and research methods. Normative and methodical documents regulating the order of organizing and carrying out medical triage of the wounded in emergencies, including acts of terrorism; data of expert examination maps; scientific works and publications devoted to the issues of medical triage of the wounded in extreme situations.

The following scientific methods were used while performing the research: content-analysis and expert assessment methods, statistical method, method of logical and informational modeling, analytical method.

Results of the study and their analysis. The results of the study, characterizing the state of problematic issues of medical triage of the victims of acts of terrorism, are presented.

* In this article the issues of medical triage are considered in relation to terrorist acts committed with the use of conventional means of destruction. Conventional means of destruction are weapons that are based on the use of explosives and incendiary mixtures (artillery, missile and aviation ammunition, small arms, mines, incendiary ammunition and flammable mixtures), as well as cold steel weapons and non-standard (home-made) explosive devices

The substantiated proposals on improvement of methodical approaches to the order of organization and performance of medical triage and allocation of sorting groups of the defeated in the terrorist act zone have been made.

Keywords: conventional means of destruction, disaster medicine, Disaster Medicine Service, defeated, emergencies, emergency medical aid, emergency specialized medical aid, medical and evacuation support, medical evacuation, medical treatment organizations, medical triage, methodical approaches, terrorist acts, terrorist act zone

Conflict of interest. The authors declare no conflict of interest

For citation: Titov I.G., Goncharov S.F., Bobiy B.V., Akinshin A.V. Issues of Medical Triage of the Wounded in Acts of Terrorism. *Meditsina Katastrof = Disaster Medicine*. 2022;3-5-11 (In Russ.). <https://doi.org/10.33266/2070-1004-2022-3-5-11>

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Medical triage — a fundamental organizational measure, the implementation of which creates the conditions for the performance of adequate actions in the organization and provision of emergency, including emergency specialized, medical care in emergency situations (ES) and medical evacuation [1-5]. Its bases were developed by the outstanding Russian surgeon N.I. Pirogov. Medical triage is widely used in disaster medicine and work of the All-Russian Disaster Medicine Service in the liquidation of medical and sanitary consequences of emergencies, including terrorist acts (acts of terrorism) [3, 5-7].

It is mentioned in the majority of guiding and methodical documents, in scientific works, textbooks and manuals, that medical triage is of special importance when a considerable number of emergency victims arrive at the stages of medical evacuation at once. In such conditions only properly organized and properly conducted medical triage can ensure a more rational use of available forces and means, high efficiency of the specialists of medical formations and medical treatment organizations on timely provision of medical care to the injured, as well as the correct conduct of medical evacuation in compliance with the routing principles [1, 3-8].

Virtually no major work devoted to the elimination of medical and sanitary consequences of emergencies, not have considered aspects of the issues of medical triage [2, 3, 6, 7, 9]. Such a situation, on the one hand, emphasizes the great importance and priority of this element in the complex of medical and evacuation measures, but, on the other hand, it indicates that to date there is no complete clarity on this issue.

In view of this, a critical evaluation of accumulated factual material and results of theoretical research, presentation of refined provisions on organization and implementation of medical triage of wounded in the area of a terrorist attack, apparently, will be useful to ensure quality and accessibility of medical care rendered to the wounded.

The authors of this article, presenting it to specialists in disaster medicine, will be grateful to all who will participate in its discussion.

The aim of the study is to develop proposals to improve methodological approaches to the organization and implementation of medical triage of the injured, mainly in the area of a terrorist attack committed with the use of conventional means of destruction.

Materials and methods of research. Study materials: normative and methodical documents regulating the order

of organization of medical triage of casualties in emergency situations, including terrorist acts committed with the use of conventional means of destruction; data of expert examination maps on the subject of research; scientific works and publications devoted to the issues of medical triage of casualties in extreme situations.

The following scientific methods were applied: content-analysis, expert estimation, statistical method, method of logical and information modeling, analytical method.

Results of the study and their analysis.

The results of the study showed that medical triage is crucial not only for the injured who have arrived at the stage of medical evacuation, but also for the injured who are in the emergency zone at the site of a terrorist attack.

In addition, it was found that insufficient attention is paid to this option of medical triage and methodological approaches to its implementation in normative and methodological documents, scientific papers and training manuals. Thus, for example, in the Order of the organization and rendering of medical aid by the All-Russian Disaster Medicine Service 1, including medical evacuation; in the Order of the rendering of emergency, including specialized emergency medical aid 2, as well as in the existing methodological documents this variant of medical triage of the injured in an emergency is not mentioned at all [1, 2, 10].

In this regard, it is reasonable to ask: "What determines the need for medical triage of the injured in the area of a terrorist attack?"

While performing this research and studying the experience of medical specialists of the Emergency Medical Service and the Disaster Medicine Service of the Russian Ministry of Health in the emergency zones of terrorist acts, the main factors requiring organization and performance of medical triage at this stage of elimination of medical and sanitary consequences of an emergency were identified and specified.

These factors were, first of all:

- arrival of a significant number of casualties — usually at one time or within a short period of time;
- need for emergency medical assistance, many of them

¹ Procedure for the organization and provision by the All-Russian Disaster Medicine Service of medical aid in emergency situations, including medical evacuation: Order of the Ministry of Health of Russia from November 6, 2020 №1202n.

² Procedure for the provision of emergency, including specialized emergency, medical care: Order of the Ministry of Health of Russia of June 20, 2013 №388n

on life-saving indications, to be rendered immediately after an emergency;

- need for a large proportion of the wounded to receive medical care in a hospital of a medical treatment organization, while for many of the wounded such treatment must be provided as soon as possible after the injury;

- need for proper routing of the wounded, taking into account severity of their condition, nature of injury and prevailing medical and tactical situation;

- need, in order to ensure medical evacuation of the wounded, to provide them with prior medical care that minimizes negative impact of transportation on their condition and compensates for delay in the provision of medical care;
- insufficient quantity of sanitary transport.

The results of the study indicate that the medical specialists of the first-arriving medical emergency team should stick to the following procedure.

The first medical team to arrive is responsible for providing medical aid and has no right to leave the place of emergency until the arrival of other teams from the emergency medical service and relevant task force. If necessary, the doctor determines the place of gathering of the injured, which is agreed with the head of rescue works and which, if possible, should be on a level place or in a nearby building (room) — especially in winter or in bad weather.

Some sources on disaster medicine present similar opinions on the actions of the first-arriving ambulance or EMT team on the scene of a terrorist attack [5, 7].

An algorithm has also been established for the medical triage of casualties at the site of the attack or at the casualty collection point.

When there are a large number or a few casualties, the doctor should initially identify two groups of casualties: stretcher-bearers and walkers. Walking casualties should be separated from the stretcher-bearers, as they may be disruptive to the work of medical personnel with the stretcher-bearers.

Before the arrival of other ambulance or emergency medical services teams, the doctor works with the stretcher-bearers, sorting them selectively by quick examination (interview) in order to identify the patients in need of emergency medical aid; by urgent indications — those in need of cardiopulmonary resuscitation, stopping external bleeding, with signs of shock and blood loss, asphyxia, with visible defects and severed limbs, convulsive states, etc. In this case, priority is given to children and pregnant women.

After that, appropriate emergency medical appointments are determined and carried out, aimed at maintaining vital functions in the affected persons.

The medical staff then proceeds to the sequential examination of the casualties, seeking, if possible, to quickly assign them to five triage groups.

It should be understood that triage is not the provision of medical care or medical evacuation, but an organizational activity that contributes to the timely provision of medical care and rational medical evacuation of the casualties. Therefore, the medical triage should not delay either the provision of medical care or the medical evacuation [3, 5-7].

The first group are the casualties requiring emergency medical assistance at the site of the terrorist attack. These are, first of all, the wounded who are in an extremely grave condition with severe impairment of vital functions. Such persons need medical care, which should be provided immediately, immediately, and for many of the victims it is

necessary for vital indications. After emergency medical aid is provided to the victims of this triage group, they must first be medically evacuated by ambulance (helicopter, ambulance, mainly by reanimobile) to a designated medical treatment facility.

When an attack occurs outside a city (a major population center) or at a considerable distance from it, and medical evacuation of casualties is carried out by ambulances, the casualties in serious condition are taken, as a rule, to the nearest hospital.

The second group is those with severe injuries or moderate injuries that are not immediately life-threatening. If necessary, they are provided with emergency medical aid. These casualties are subject to primary evacuation by ambulance to a hospital facility.

The third group is those with injuries of moderate severity and not acutely expressed functional disorders or without them. These casualties are sent by ambulance transport to the medical organization in the second turn, as a rule, without medical care.

Attention should be paid to the fact that in this triage group there may be persons with relatively unsevere somatic pathology, most prone to psychopathic reactions with active hysterical and sometimes panic manifestations. Their early medical evacuation from the terrorist attack zone and hospitalization will contribute to the preservation of social stability in a public situation.

The fourth group is those with minor injuries (lightly wounded), who do not need emergency or urgent medical care. If necessary, they can perform individual medical aids — application of sterile or immobilization bandages, simple splints, administration of anesthetics, etc. Such patients are referred to outpatient treatment at the place of residence.

It should be borne in mind that, at the very beginning of work in the emergency zone, all measures must be taken to separate this group of casualties, together with the walkers, from those in need of hospital treatment, mainly stretcher-bearers.

The fifth group is those who died in the area of the terrorist attack. The bodies of the dead remain for a short time at the site of the terrorist attack until the necessary operational-investigative actions are performed. After that they are transported in the prescribed manner to the forensic (pathology and anatomy) laboratory (department).

It should be noted that during the elimination of medical and sanitary consequences of terrorist attacks, as well as in other emergencies, in the terrorist attack zone (outside the medical organization) the group of "non-transportable" is not distinguished among the affected. They are all subject to medical evacuation to the appropriate hospital in accordance with the principles of routing.

The study has shown that such a procedure for distributing the wounded according to their group affiliation, determining and performing the corresponding actions takes place especially often at the initial stage of elimination of medical and sanitary consequences of a terrorist attack, when due to the shortage of medical forces and evacuation means there are cases of forced delay in providing medical care and reducing its volume for those who have not been identified as having disorders of vital functions. To this circumstance authors of some scientific and educational-methodical works [5, 7] pay attention.

Taking into account the above, we can conclude that the medical triage of the wounded in the area of a terrorist at-

tack is performed mainly on the basis of two leading characteristics that allow the distribution of the wounded into sorting groups.

The first criterion is based on the need for medical aid, the place and the priority of its provision:

- those in need of emergency medical care at the site of the terrorist attack — first or second priority;
- those in need of medical care and treatment in the inpatient unit;
- those in need of outpatient treatment at their place of residence.

If, at the site of the terrorist attack, persons with injuries (wounds) incompatible with life are identified among the victims, as mentioned above, they are subject to medical evacuation to the nearest hospital. When carrying out medical evacuation of such wounded from the terrorist attack zone by helicopter, they can be delivered not only to the nearest medical organization, but also, subject to indications, mainly to higher level medical organizations located at a considerable distance from the terrorist attack site.

The second feature — based on the expediency of evacuation, type of transport, sequence and method of transportation:

- those subject to medical evacuation to medical organization (by which transport; in which turn — first or second; lying down or sitting down);
- not in need of medical evacuation and subject to referral for outpatient treatment at the place of residence.

The degree of statistical significance of the obtained results of the study concerning the technology of performing medical triage of the injured was determined by means of expert evaluations. The results showed that 95.3% of the experts agreed with the proposed organizational and methodological approaches to the medical triage of the victims of terrorist attacks performed in the pre-hospital period; 4.7% of the experts found it difficult to give a specific assessment of these proposals.

Consequently, the results of the expert evaluation of the proposed technology for organizing and conducting medical triage in the area of a terrorist attack indicate the advisability of introducing these proposals into the relevant regulatory and methodological documents in the form of additions.

When studying the experience of eliminating medical and sanitary consequences of terrorist attacks, it was found that the medical evacuation of the injured from the emergency zone can be carried out to one or more medical organizations. As an example, the organization of medical evacuation of the wounded to several medical organizations during the liquidation of the medical and sanitary consequences of the terrorist attack in Moscow (figure).

It turned out that such an organizational decision mainly depends on: number of wounded and its structure; their contingent; state of the medical organization infrastructure and their specialization; availability of "free" hospital beds of the corresponding profile, especially specialized ones; opportunities of medical assistance; location of medical treatment organizations in relation to the site of the attack (city, suburban area, at a considerable distance from a major population center).

If medical evacuation is carried out to a single hospital facility, the medical triage mainly identifies the casualties requiring emergency medical assistance at the scene (at the point of collection of the casualties, before their transport-

tion) taking into account the priority of its provision.

The next task of medical triage in the above case is the distribution of the wounded according to evacuation needs, i.e. in what turn and in what position the wounded should be in the ambulance during medical evacuation.

If the medical evacuation of the wounded from the terrorist attack zone was to be performed to several medical organizations, the study showed that one of the main and very difficult tasks of medical triage was to determine the prognostic evacuation assignment, depending on the nature and severity of the injury (wounding): in which medical organization; in which turn; by what mode of transport; in what position during transportation.

In addition, it was found that the effective implementation of the established evacuation purpose is possible only if certain conditions are met: presence of good communication, clear organization of the work (promptly, timely, uninterrupted) availability of dispatching service, as well as the clear and prompt work of the relevant health authorities to make decisions on the distribution of the affected people in medical treatment organizations, on sufficient (required) number of medical brigades and vehicles.

It should be recognized that it is not always possible to fully implement the triage conclusion and the decision on the distribution of the affected persons.

For example, E.M. Luk'yanchuk notes that during the liquidation of the medical and sanitary consequences of the explosion in a trolleybus in Moscow on Prospekt Mira, by order of the Department of Health of Moscow, all the injured (28 people) had to be sent to the Research Institute of Emergency Care named after N.N. Sklifosovskiy. But the reality proved to be different. Twenty-four persons were hospitalized in the Research Institute of Emergency Care named after N.N. Sklifosovskiy; two persons were hospitalized in municipal clinical hospitals ¹33 and 20, i.e. three medical treatment organizations were actually involved [11].

This variant of medical triage of the wounded during the liquidation of the medical and sanitary consequences of a terrorist attack differs from the similar work of the military medical service — the wounded and sick from the military personnel participating in combat operations, as a rule, receive an evacuation assignment only at the stage of primary medical and sanitary care.

This circumstance emphasizes once again that the medical triage of victims of a terrorist attack, carried out in the emergency zone, should be carried out by the most trained, primarily medical, ambulance crews and EMTs.

It should be noted that in both cases, the use of general purpose vehicles for the evacuation of casualties cannot be ruled out. In such cases, the medical triage of casualties must include the allocation of casualties that can be transported from the emergency area to the hospital in ordinary transport and in what position.

When analyzing the experience of work to eliminate medical and sanitary consequences of terrorist attacks, it was found that the victims with relatively minor injuries and wounds, without waiting for the arrival of the ambulance and emergency medical teams, sought medical assistance on their own in medical treatment organizations. For the most part, it was this category of people who, during medical triage carried out in hospital facilities, belonged to the fourth triage group.

In this case, such arrival of the injured in medical organizations is referred to as "self-sorting" [5, 12]. [5, 12]. This

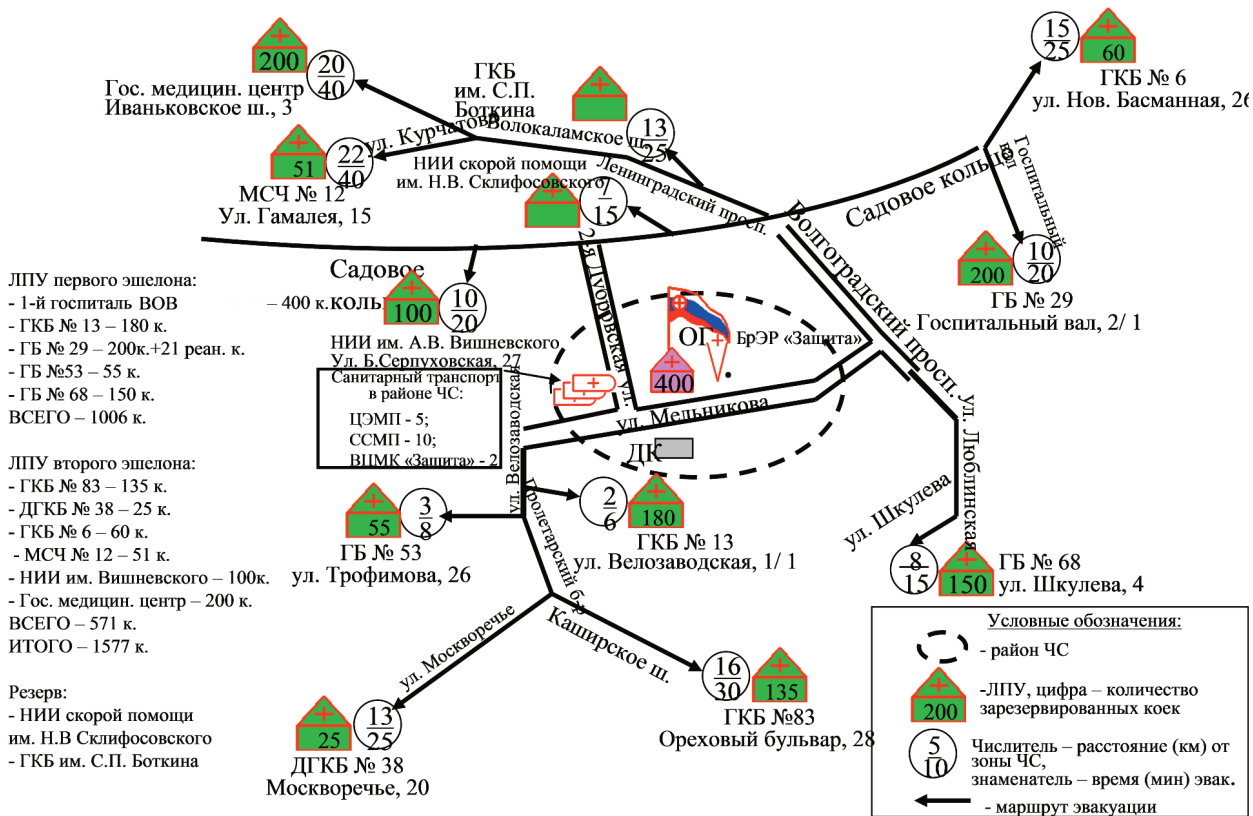


Рисунок. Схема организации лечебно-эвакуационного обеспечения пострадавших при теракте в культурно-развлекательном центре шарикоподшипникового завода (Москва, октябрь 2002 г.)
Figure. Scheme of organization of medical and evacuation support for those affected by the terrorist attack in the cultural and entertainment center of the ball-bearing plant (Moscow, October 2002)

phenomenon occurred in many terrorist attacks. For example, during the terrorist attack in Beslan (2004) about 7.5% of the wounded were transported to the medical organizations by motor vehicles [13]. When dealing with the medical and sanitary consequences of other emergencies (not terrorist attacks), the proportion of persons arriving at medical organizations "by gravity" is usually much higher. This situation can be explained by strict implementation of regime measures during liquidation of the consequences of terrorist acts, as well as by the presence of a developed health care infrastructure in the places where they occurred.

Some medical specialists consider this phenomenon as a positive fact when dealing with the aftermath of terrorist attacks. This is mainly due to the readiness of eyewitnesses to provide first aid, including transporting the victim to the medical organization within a short time after injury (wounding), as well as reducing the risk of repeated or secondary damage.

When the wounded arrive from the terrorist attack zone to the stage of medical evacuation (field hospital or mobile medical detachment, medical center, etc.), after unloading the wounded from vehicles, they, as a rule, in the reception department (inpatient department), carry out, in accordance with the adopted general methodological approaches and rules, medical triage.

Given the object of the study and a sufficiently detailed description of the order of organization and conduct of medical triage of the injured at the stages of medical evacuation, apparently, there is no need to dwell in more detail on the technology of its conduct [2, 3, 7, 9].

However, the results of studying the experience of eliminating medical and sanitary consequences of terrorist attacks show that in a number of cases medical triage, conducted at the stages of medical evacuation, was not performed in its classic version, which implies the formation (allocation) of typical conventional triage groups of the injured. For example, at the admission of children injured in the terrorist attack to the Field Pediatric Hospital of the All-Russian Center for Disaster Medicine "Zaschita" of the Russian Ministry of Health (Central Regional Hospital – Beslan), they were divided into 4 triage groups (Table). It can be seen from the table that the medical specialists sought to proceed as quickly as possible to provide specialized medical care to the injured in the medical organizations of the 2nd and 3rd levels, located in Vladikavkaz [13]. To achieve this goal, the medical triage and medical evacuation of the injured were organized accordingly.[Table]

Under conditions of liquidation of medical and sanitary consequences of terrorist attacks with a large number of victims, when repeatedly at short intervals in medical organizations may arrive numerous groups of victims, especially those whose condition is assessed as severe and extremely severe, when performing medical triage in the emergency department of medical organization the scope of diagnostic procedures should be limited to the identification of triage features necessary for a reasonable triage conclusion. Obviously, if a casualty has, for example, severe asphyxia or external bleeding phenomena, it is hardly necessary to examine "skin condition", "speech" or "motor" reactions, since these are of no importance for making a proper triage decision [3, 5, 9].

Распределение детей, пораженных при теракте, на сортировочные группы при их поступлении в ЦРБ г.Беслана – Полевой педиатрический госпиталь ВЦМК «Защита» Минздрава России (2004)
 Distribution of children injured in the terrorist attack, in triage groups upon admission to Beslan's Central Clinical Hospital – All-Russian Center for Disaster Medicine "Zashchita" field pediatric hospital (2004)

Сортировочная группа Triage group	Число детей, чел. Number of children, people.	Сортировочное заключение* / Triage opinion
Первая First	199	Подлежащие незамедлительной эвакуации на следующий этап оказания медицинской помощи (ЛМО г.Владикавказ) после оказания доврачебной и первой врачебной медицинской помощи Victims subject to immediate evacuation to the next stage of medical care (Vladikavkaz medical organisations) after pre-hospital and first aid
Вторая Second	52	Нуждающиеся в экстренных медицинских мероприятиях по жизненным показаниям в объеме первой врачебной и квалифицированной медицинской помощи The injured, who need emergency medical measures for life indications in the volume of the first medical and qualified medical care
Третья Third	5	Не подлежащие эвакуации на следующий этап и нуждающиеся в проведении симптоматической терапии Affected persons not to be evacuated to the next stage and needing symptomatic therapy
Четвертая Fourth	55	Дети, не имеющие ранений и травм Children admitted with no wounds or injuries

* Указанные в таблице виды медицинской помощи существовали до принятия Федерального закона «Об основах охраны здоровья граждан в Российской Федерации» от 21 ноября 2011 г. № 323-ФЗ

* These types of medical care correspond to the provisions of the regulatory documents governing the activities of the Emergency Medicine Service of the Russian Ministry of Health, which were in effect at the time

As for determining the effectiveness of medical triage, it is necessary to proceed from the following provision — it is determined, on the one hand, by the timely and clear implementation of the adopted triage decisions, on the other — by the creation of conditions for the most optimal compliance and implementation of the principles of routing of the injured, by the full use of the possibilities for the provision of medical care by specialists of the emergency teams, medical treatment organization (at medical evacuation stage).

As an example, confirming the above, we can give a description of the rescue work during the liquidation of the consequences of the terrorist attack in New York (USA) in 2001. So, B.Eiseman points out that there were cases when the medical triage of the victims in the terrorist attack zone was not carried out and, therefore, there was no clear distribution of the victims among the medical treatment organizations that were ready enough to receive the victims and provide them with the necessary medical care. As a result, all the hospitals closest to the site of the tragedy were quickly filled with casualties, and it proved difficult, if not impossible, to reassign the wounded to other medical institutions within a short period of time [14].

Conclusion

The study of the experience of liquidating medical and sanitary consequences of terrorist acts, especially those ac-

companied by numerous sanitary losses, has shown that the medical triage of the wounded in the terrorist attack zone is an objective necessity and an important part of the medical and evacuation support, allowing conditions to increase the availability and quality of medical care and medical evacuation with optimal observance of the routing principles.

At the same time, the existing normative and methodological documents do not give a sufficiently clear and complete picture of the organization and conduct of the medical triage of the victims of a terrorist attack committed with conventional means of destruction, especially at the site of the attack.

On the basis of the analysis of the results of theoretical works, experience in the organization of medical evacuation during the liquidation of the consequences of terrorist acts committed with the use of conventional means of destruction, the improved methodical approaches to the organization and implementation of the medical triage of the wounded in the terrorist attack zone are proposed.

Thus, it can be stated that the results of the study have a pronounced practical significance for increasing the effectiveness of life-saving and health preservation of the injured during terrorist attacks, rational and effective use of medical forces and means involved in providing medical assistance and conducting medical evacuation.

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Материал поступил в редакцию 22.07.22; статья принята после рецензирования 12.09.22; статья принята к публикации 23.09.22
 The material was received 22.07.22; the article after peer review procedure .22; the Editorial Board accepted the article for publication 23.09.22