

# БЕЗОПАСНОСТЬ В ЧРЕЗВЫЧАЙНЫХ СИТУАЦИЯХ SAFETY IN EMERGENCY ENVIRONMENT

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## MAIN CONDITIONS AND FACTORS AFFECTING THE ORGANIZATION OF MEDICAL CARE DELIVERY AND MEDICAL EVACUATION IN TERRORIST ACTS INVOLVING EXPLOSIVE DEVICES AND CONVENTIONAL WEAPONS

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**Abstract.** *The purpose of the study is to identify and characterize the most typical conditions and factors affecting the organization of medical care and medical evacuation of victims of terrorist attacks based on the study and analysis of the experience of eliminating the medical and sanitary consequences of terrorist acts committed on the territory of Russia with the use of explosive devices and conventional weapons.*

*Materials and methods of research.* The materials of the study were: normative and methodological documents regulating the organization of medical care and medical evacuation during terrorist acts; dispatches and reports of the territorial centres for disaster medicine on the elimination of medical and sanitary consequences of 162 terrorist acts, including 6 terrorist attacks with the capture and holding of hostages committed in 1998-2010; documents of official correspondence of the All-Russian centre for disaster medicine Zashchita on issues of medical support of the population during terrorist acts; scientific papers and publications on the research problem.

When performing the research, the following methods were used: historical, content analysis, statistical, and analytical.

*Research results and their analysis.* The following issues were considered during the research:

- means of conducting terrorist activities and their application specifics;
- high degree of vulnerability and damage to the population;
- the nature of the object where the terrorist act was committed;
- sanitary losses and their characteristics;
- psychological situation, capture and holding of hostages, the presence of a threat to their lives;
- terms of elimination of medical and sanitary consequences of terrorist attacks;
- the needs and capabilities of medical organizations (LMO) of the regions in delivery of medical assistance to victims of terrorist attacks;
- needs and capabilities of LMO of the regions in medical evacuation;
- features of the organization and conduct of measures to eliminate the consequences of terrorist acts.

Based on the results of the analysis of the experience in liquidation of medical-sanitary consequences of terrorist attacks, as well as analysis of basic conditions and factors influencing the organization of medical care and conduct of medical evacuation, the methodical approaches are suggested: to comprehensive assessment of conditions and factors typical for terrorist attacks with use of explosive devices and conventional weapons; to use of medical-and-evacuation characteristics of victims in the organization of medical care and conduct of medical evacuation; to increase the readiness of the regional health sector in facing the challenges of liquidation of medical and sanitary consequences of terrorist attacks.

**Key words:** *conventional weapons, emergencies, explosive devices, losses, medical assistance, medical consequences, medical evacuation, medical formations, medical organizations, terrorist acts*

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## ОСНОВНЫЕ УСЛОВИЯ И ФАКТОРЫ, ВЛИЯЮЩИЕ НА ОРГАНИЗАЦИЮ ОКАЗАНИЯ МЕДИЦИНСКОЙ ПОМОЩИ И ПРОВЕДЕНИЯ МЕДИЦИНСКОЙ ЭВАКУАЦИИ ПРИ ТЕРРОРИСТИЧЕСКИХ АКТАХ С ПРИМЕНЕНИЕМ ВЗРЫВНЫХ УСТРОЙСТВ И ОБЫЧНЫХ СРЕДСТВ ПОРАЖЕНИЯ

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**Резюме.** Цель исследования – на основе изучения и анализа опыта ликвидации медико-санитарных последствий террористических актов, совершенных на территории России с применением взрывных устройств и обычных средств поражения, выявить и охарактеризовать наиболее типичные условия и факторы, влияющие на организацию оказания медицинской помощи и проведения медицинской эвакуации пострадавших при терактах.

**Материалы и методы исследования.** Материалами исследования были: нормативные и методические документы, регламентирующие порядок организации оказания медицинской помощи и проведения медицинской эвакуации при террористических актах; донесения и отчеты территориальных центров медицины катастроф о ликвидации медико-санитарных последствий 162 террористических актов, в том числе 6 терактов с захватом и удержанием заложников, совершенных в 1998–2010 гг.; документы служебной переписки Всероссийского центра медицины катастроф «Защита» (ВЦМК «Защита») по вопросам медицинского обеспечения населения при террористических актах; научные работы и публикации по проблеме исследования.

При выполнении исследования применялись следующие методы: исторический, метод контент-анализа, статистический, аналитический.

**Результаты исследования и их анализ.** При проведении исследования рассматривались следующие вопросы:

- средства ведения террористической деятельности и особенности их применения;
- высокая степень уязвимости и поражения населения;
- характер объекта, на котором был совершен террористический акт;
- санитарные потери и их характеристика;
- психологическая обстановка, захват и удержание заложников, наличие угрозы для их жизни;
- сроки ликвидации медико-санитарных последствий терактов;
- потребности и возможности лечебных медицинских организаций (ЛМО) регионов по оказанию медицинской помощи пострадавшим при терактах;
- потребности и возможности ЛМО регионов по проведению медицинской эвакуации;
- особенности организации и проведения мероприятий по ликвидации последствий террористических актов.

На основании результатов анализа опыта ликвидации медико-санитарных последствий терактов, а также анализа основных условий и факторов, влияющих на организацию оказания медицинской помощи и проведения медицинской эвакуации, предложены методические подходы: к комплексной оценке условий и факторов, имеющих место при терактах с применением взрывных устройств и обычных средств поражения; к использованию лечебно-эвакуационной характеристики пострадавших при организации оказания медицинской помощи и проведения медицинской эвакуации; к повышению готовности сферы здравоохранения регионов к реагированию и действиям при ликвидации медико-санитарных последствий терактов.

**Ключевые слова:** взрывные устройства, лечебные медицинские организации, медико-санитарные последствия, медицинская помощь, медицинская эвакуация, медицинские формирования, обычные средства поражения, санитарные потери, террористические акты, чрезвычайные ситуации

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At present, it is impossible to completely exclude the possibility of terrorist acts on the Russian Federation territory. It is due to a variety of reasons. In recent years, large terrorist acts took place, and terrorist activities are at raise [1-5]. According to the territorial centers of disaster medicine (TCMK), in 2010–2019 in Russia there were 10 emergencies (ChS), caused by large-scale terrorist acts with the use of explosives and conventional weapons, number of victims in which exceeded 50 people. The total number of victims of these terrorist attacks was 1399 people, including 405 people (28.9%) killed, 759 people (76.4% of the total number of sanitary losses) were hospitalized. All this urges the need to thoroughly prepare the health care system at all levels to the work on elimination of medical and sanitary consequences of such emergencies.

It is known that when organizing medical assistance to victims of terrorist attacks, which includes organizing their medical evacuation, it is necessary to take into account the specific conditions in which the terrorist attack was committed. Fulfillment of this requirement ensures the successful work of health authorities, medical units and medical organizations (LMOs) to save lives and to preserve the health of victims.

It should be noted that, according to foreign and domestic sources, today, terrorist attacks are carried out most often with the use of explosive devices and conventional weapons [6–11].

The study and analysis of regulatory and methodological documents, scientific works and other sources indicate that until now the main factors that exert influence upon terrorist acts, including acts with the use of explosive devices and conventional weapons, and that affect the organization and implementation of a complex of medical and evacuation measures, have not been studied.

**The purpose of the study** is to identify and to describe the most typical conditions and factors affecting the organization of medical care and medical evacuation of victims on the basis of studying and analyzing the experience of eliminating medical and sanitary consequences of terrorist acts with the use of explosive devices and conventional weapons committed in Russia.

**Materials and research methods.** The research materials were: normative and methodological documents regulating the procedure for organizing the provision of medical care and conducting medical evacuation in case of terrorist acts; reports of the territorial centers of disaster medicine on the elimination of medical and sanitary consequences of 162 terrorist acts, including 6 terrorist attacks with taking of hostages, committed in 1998–2010 (this period of time is considered to be the peak of terrorist activity in Russia) and classified as emergency situations; incoming and outgoing documents of official correspondence of the All-Russian Center for Disaster Medicine "Zashchita" (VCMK "Zashchita") of the Ministry of Health of Russia \* on the issues of medical support of population in case of terrorist acts; scientific works and publications on the research problem.

In addition, the entire general aggregate of terrorist acts committed on the territory of Russia was studied using a continuous method.

Within the research, the following methods were used: historical, content analysis, statistical and analytical methods.

In the course of identifying and studying the conditions and factors affecting the organization of medical care and medical evacuation of victims of terrorist attacks, one of the most fore-

ground methodological approaches was scenario analysis of terrorist attacks as well as the analysis of the formation and elimination of their medical and sanitary consequences. This approach was preferable due to the fact that scenarios of various terrorist attacks allow a more comprehensive and objective assessment of the influence of various conditions and factors upon the activities of health authorities, medical units and medical organizations, as well as upon the process of eliminating the medical and sanitary consequences of terrorist attacks.

**Research results and their analysis.** In the course of the study, a number of conditions and factors were identified that must be taken into account when eliminating medical and sanitary consequences of terrorist acts. Let's consider the most significant of them.

*Means of terrorist activities and features of their use.* The analysis of terrorist acts shows that they were all carried out with the use of various explosive devices and conventional weapons. The results obtained in the study are fully consistent with the observed trend in the use of weapons in terrorist activities [6–8, 10].

The use of various explosive devices and conventional means of destruction was accompanied by bullet and shrapnel wounds, mine explosive injuries (MVI), which determined the nature of the injury and the need to use certain technologies for organizing and providing medical assistance to the wounded and for carrying out their medical evacuation.

In other words, each means used in a terrorist attack in specific conditions specifically influenced the treatment and evacuation characteristics of victims, as well as the organization and provision of medical care.

As a result of the use of these weapons in open areas, bullet, fragmentation and other wounds were common; when they are used in buildings (closed spaces), the proportion of victims with thermal burns, secondary lesions, and barotrauma increased. Many victims remained in the rubble for a long time, which increased the likelihood of secondary lesions, prolonged compression syndrome, and untimely medical care [12–14].

It should be noted that, as the practice demonstrates, medical specialists in their daily activities rarely treat patients with such wounds and injuries. Consequently, they lack all the necessary experience and modern technologies for treating such victims. This provision must be taken into account when training medical specialists.

*High degree of vulnerability and damage to the population.* As evidenced by the experience of eliminating medical and sanitary consequences of terrorist acts, they were committed mainly (93.8%) in large cities in crowded places. As a result of such terrorist attacks a large number of victims appeared, including those in need of emergency medical aid (EMP) both in the pre-hospital and in hospital periods. In addition, many victims - up to 25.0% and more - needed a quick medical evacuation from the scene to medical organizations.

It should be emphasized that committing terrorist attacks in cities is a stable trend not only in Russia, but also in other countries. Taking this into account, it should be noted that, in contrast to rural areas, the healthcare infrastructure in cities is more developed: in each city, as a rule, there are several medical facilities, which have sufficient capabilities to provide various types of medical care to victims and to conduct their medical evacuation.

When organizing medical support for the population affected by terrorist acts, one important circumstance should be taken into account - the trend of rapid growth of the urban population. In cities, there are government bodies, governing organizations, highly dangerous, life support and economical facilities, which can be targeted by terrorist attacks. Therefore, one can assume certain focuses of possible terrorist activity in cities and objects with a large concentration of people.

This situation obliges the health authorities and the Disaster Medicine Service (SMK) of the Ministry of Health of Russia, primarily in the regions: to have, if possible, relevant data on the most vulnerable infrastructures (facilities) in the region; to assume a considerable negative impact of dangerous and vital facilities destruction on the work of public health services to eliminate medical and sanitary consequences of terrorist attacks; to determine the main directions of the activities of health authorities and medical organizations in relation to the most probable and vulnerable targets of terrorist attacks; to develop multivariate schemes of medical support for victims of terrorist attacks and to increase readiness for their implementation.

Since the main work to save lives and to preserve health of victims of terrorist attacks was carried out by the health care of the regions in which they were committed, it can be concluded that the quality of medical care provided to the victims largely depends on the readiness of medical forces and means of the regional level to work in "non-standard" difficult emergency conditions.

It should be noted, however, that among the emergencies caused by terrorist attacks, there were also emergencies of a federal scale (up to 2.9%), the occurrence of which was due to terrorist attacks with a large number of victims. In this regard, the issues of the readiness of the health care system not only at the regional, but also at the federal level to work to eliminate the medical and sanitary consequences of terrorist acts require constant attention.

The distribution of emergencies caused by terrorist attacks with the use of explosive devices and conventional means of destruction, in terms of their scale, allows to assert that medical and sanitary consequences, as a rule, have a pronounced territorial localization. In this situation, more favorable conditions are created for the short time allocation and concentration of necessary medical forces and means and for the organization of their work to eliminate the consequences of a terrorist attack, which all leads to more significant results.

The research data also indicate that armed conflicts and counter-terrorist operations can be accompanied by major terrorist acts not only near, but also at a considerable distance from the conflict zone or from the area of the counter-terrorist operation.

This situation can also take place in modern time hybrid wars.

This means that during such events, it is necessary to pay increased attention to the readiness of health care to work to eliminate medical and sanitary consequences of terrorist attacks, not only in regions with a high level of their risk, but throughout the country. In addition, the LMO should more thoroughly and fully implement measures to counter terrorism.

The nature of an object at which the terrorist act was committed. The study of the experience of eliminating medical

and sanitary consequences of terrorist acts has shown that they can be carried out at a wide variety of facilities. It turned out that this circumstance can influence the organization of medical and evacuation measures not only in prehospital, but also in hospital periods [7, 9, 12-15].

From a methodological point of view, in relation to solving the problems of medical support of the population during terrorist attacks, these objects were divided into 2 main groups: mobile objects - vehicles - an airplane, train, bus and other and stationary objects - a residential building, a railway station, an airport, stadium, shopping and cultural and entertainment center, administrative building, medical organization, etc.

It was found that, depending on the nature of an object belonging to a particular group, the impact on the ability to predict medical and sanitary consequences of terrorist attacks, planning the organization and provision of medical assistance to victims and conducting their medical evacuation can be different and require development of multivariate schemes for treatment and evacuation measures.

As a result of the analysis of the terrorist attacks, it was revealed that most often (39.3%) they occurred on vehicles and on communications. The following objects have a high degree of vulnerability: the administrative buildings of the Ministry of Internal Affairs of Russia, the Department of Internal Affairs, the ROVD, the Central Internal Affairs Directorate, etc. - 11.6%; markets - 8.9; residential buildings - 6.7; venues for various events with a large number of people - 3.6%. Even these data allow us to assert that terrorist attacks, as a rule, were committed in the most crowded places, in the presence of employees of law enforcement agencies and authorities, which led to the defeat of a large number of people.

It should be noted that during the period under study, some terrorist attacks committed in Russia included capture of an aircraft with hostages, accompanied by numerous human casualties. One of the specific features of such terrorist attacks was that in an explosion on board during the flight, all passengers and crew members died, and in an explosion on board in an airport, the survivors received severe multiple and concomitant injuries and burns.

When studying the objects where terrorist acts were committed, depending on the location of a specific object in relation to large settlements (centers) with a developed health infrastructure, 3 options for a possible location of the emergency zone - which is a focus of medical and sanitary consequences of a terrorist attack: in a city, in a suburban zone and in an area located at a considerable distance from a large settlement [16].

*First option.* If terrorist attacks were committed at objects located within the boundaries of a large city, then, as a rule, several LMOs were located at a small distance from the emergency zone. At the same time, there was an opportunity for almost all victims who needed medical care and treatment in a hospital environment to be sent to the medical facilities of the 2nd and 3rd levels. In these conditions, the main task of medical specialists in the emergency center is to skillfully manage the medical evacuation, which is carried out mainly by ambulance teams (SMP), taking into account the availability of beds of one or another profile in a particular medical facility and the dynamics of their occupancy.

It is necessary to pay attention to the fact that under these conditions, victims received medical care and treatment be-

fore an onset of outcome, mainly in the medical center to which they were initially admitted. Thus, their transfer from one medical treatment organization to another, as well as inter-hospital medical evacuation, were minimized.

*Second option.* In those cases when terrorist attacks were committed in a suburban area - the distance from the city was up to 100 km - in contrast to the first option, the number of victims sent to the 1st level medical treatment facilities increased by almost 1.5 times, the proportion of those evacuated to the medical treatment facilities of level 2 - by 15–20%, and the share of evacuees to level 3 medical facilities decreased by 25–30% or more.

Subsequently, this situation led to the need to organize inter-hospital medical evacuation of victims.

*Third option.* Not often, but there were cases when the centers of terrorist attacks were at a considerable distance from LMOs of the 2nd and 3rd levels. Such attacks were carried out mainly at transport facilities. When such terrorist attacks were committed in the emergency zone, it was difficult to organize and carry out medical and evacuation measures.

The elimination of medical and sanitary consequences of these terrorist acts required, as a rule, more time to identify and to allocate all the necessary medical forces and means, for their deployment and operation in the emergency scene. In many cases the emergency area medical evacuation routes were of poor quality, impassable, or practically non-existent.

Taking into account the specific conditions of such terrorist attacks, it may be necessary to deploy an evacuation receiver in the emergency zone, primarily using mobile medical units of the Disaster Medicine Service. However, to date, in most regions there are no such regular formations.

In the course of eliminating medical and sanitary consequences of such terrorist attacks, the burden on the 1st level medical facilities for providing medical assistance to victims, mainly in emergency and urgent modes, increases significantly. Consequently, this provision may lead to the need for a temporary strengthening of these LMOs by medical teams and individual medical specialists capable of providing the necessary medical care in accordance with the situation.

In such terrorist attacks, the role of medical evacuation sharply increased. The proportion of evacuees (50–60%) to the 1st level medical facilities increases significantly, and the proportion of those evacuated to the 2nd and 3rd level medical facilities was 20–25% and less than 15–20 % respectively.

The structure of the evacuation work and the routing of victims indicate that in such terrorist attacks taking into account the peculiarities of regions, it is often impossible to carry out high-quality medical and evacuation measures without carrying out sanitary-aviation evacuation both from the emergency site and subsequently between hospitals for inter-hospital medical evacuation, especially from LMO level 1.

Based on the above, the following recommendations can be formulated.

*In order to increase the readiness of the regional health-care system to respond to probable terrorist attacks committed at stationary facilities, it is necessary: to have a forecast of an approximate number of victims, of a required number of SMP and SMK teams, as well as of a number of ambulances, helicopters as well as an established procedure for their use; to determine, taking into account the location of an object of a possible terrorist attack, LMOs that will be*

*able to receive victims depending on their condition, profile and preference for providing them with comprehensive medical care and treatment until the final outcome; determine and agree with the traffic police on the routes of medical evacuation of victims from the emergency scene to the designated medical and health care facilities; if necessary, to determine possible options and procedure for strengthening hospital institutions, trauma centers with medical forces and means, transferring hospitals from a routine to high alert.*

All this, including the issues of interaction, should be reflected in detail in the relevant plans of regional centers for emergency medical care and disaster medicine (SMP and MC), territorial centers for disaster medicine.

At the same time, in relation to such objects as residential buildings, streets, vehicles, it is not possible to plan in advance an implementation of such preparatory measures.

Consequently, in order to adequately respond to such terrorist attacks, it is necessary to achieve a higher degree of public health readiness for operational and multifaceted work to eliminate their medical and sanitary consequences.

*Sanitary losses and their characteristics.* In case of terrorist acts, the organization and provision of medical assistance, including medical evacuation, are significantly influenced by medical and evacuation characteristics of victims. This characteristic is a multicomponent category formed by several factors (indicator elements): the number of victims (adults, children, women); the severity of their condition; localization and nature of injuries, etc. Each of these factors affects both organization and content of medical and diagnostic work in a specific medical unit or in a medical facility involved in the elimination of medical and sanitary consequences of a terrorist attack, as well as the entire work on the organization and provision of medical care and medical evacuation of victims.

In modern literature, information about victims (sanitary losses) during terrorist attacks, as a rule, characterizes only one indicator, while reporting documentation and classifiers of the nature of lesions used in the healthcare system are not sufficiently adapted to the conditions of activity of medical units and medical facilities during liquidation of health consequences of terrorist attacks.

The results of studying the experience of eliminating the consequences of terrorist acts indicate that, taking into account time parameters, sanitary losses during terrorist attacks occur, as a rule, at one time or within a short period of time. This situation allows us to draw an important organizational conclusion - during the elimination of consequences of a terrorist attack, it is impossible to train specialists of medical units and medical facilities - except for cases of seizure and long-term holding of hostages - and, therefore, this must be done in advance.

In terrorist attacks, in order to make a decision on the organization and provision of medical assistance, and on the conduct of medical evacuation, data on the possible needs of victims in medical care, provided in hospitals and outpatients, are important. In the course of the study, it was found that during terrorist attacks the proportion of victims who needed inpatient treatment fluctuated within fairly significant limits and averaged 58.0–76.0% [12, 13, 17].

Undoubtedly, data characterizing the distribution of victims receiving medical care and treatment in hospitals, according to the localization of wounds and injuries, according to the main lesion, are of great importance for practical health care.



The study showed that most often the victims with wounds of the lower and upper extremities, head and chest were admitted to the LMO hospitals (Table 1).

Naturally, the distribution of victims according to the location of the injury cannot be the only indicator in various terrorist attacks. Using this approach, the characterization of victims will not be complete, since it does not answer the question of how often multiple and combined lesions occur. Therefore, when studying the experience of liquidating medical and sanitary consequences of terrorist attacks, it was specifically determined that the victims were often diagnosed with multiple (23.9–26.7%) and combined (25.8–29.5%) injuries.

Terrorist attacks (explosions), committed in closed rooms (buildings) and underground passages, were often accompanied by thermal injury. Thus, according to the Scientific and Practical Center for Emergency Medical Aid of the Moscow Department of Health, in some terrorist attacks the proportion of victims with thermal trauma was 5.1%, and in the terrorist attack in Beslan - 6.7% [12, 13].

Among the combined and multiple wounds, the severity and originality of the mine-explosive injury (MVT) stands out, the share of which in the structure of injuries was 27.8–30.1% and more.

Thus, in the total number of hospitalized after the terrorist attack in Beslan, the proportion of wounded was 85.5%, including 54.4% of the wounded with MVT; more than a quarter of the victims had injuries of several anatomical areas, inflicted by one wounding element - combined wounds.

It should be noted that in terrorist attacks, MVT occurs quite often and is problematic in terms of providing medical assistance. In each case, its inherent features determine the need for an appropriate approach to assessing the severity of injury, the choice of diagnostic methods, of surgical treatment, as well as of intensive therapy and resuscitation measures [11, 12, 14].

An analysis of provision of medical assistance to victims of terrorist attacks showed that at the time of seeking medical help, the victims had injuries of varying severity - as a rule, 28.1–34.5% of victims had minor injuries; moderate - 34.2–39.1; severe and extremely severe - 27.4–30.5% of victims.

The data characterizing the severity of the victims' condition, to a certain extent, is useful for medical specialists, starting from those in the admission department of the LMO. They can get a notion of what category of victims they may have to work with; what activities must be prepared when providing, first of all, emergency medical care; what kind of consultations, including telemedicine, may be required.

Among those hospitalized with injuries of severe and extremely severe severity, most often there were persons with abdominal injuries - 34.2–38.1%; spine - 34.5–37.8; chest - 30.3–35.2% (Table 2). However, as the study showed, with various terrorist attacks, the parameters of this indicator can fluctuate within fairly wide limits. So, from the contents of the Table 3 it can be seen that the data presented in it differ from the average statistical indicators presented in Table 2.

It should be noted that in 13.0–15.0% of cases or more, the victims were admitted to hospitals in a state of shock. It follows from this that in the provision of medical care, especially outside a medical organization, the main thing is the prevention of shock and its treatment. Therefore, the personnel of the ambulance brigades and emergency response teams (BER) of SMK should be well trained in the technologies of maintaining vital functions in the victims and equipped with an appropriate medical equipment.

Depending on the characteristics of a particular terrorist attack, the structure of the contingent of victims in terms of localization and severity of injuries may be different, but in any case, the indicators obtained as a result of this study reflect the priority of tasks for organizing and providing medical care, as well as for carrying out medical evacuation of victims in such emergencies.

It should be noted that the injured, who were held hostage for a long time, have more severe injuries and complications

Таблица 1/Table 1

**Распределение пострадавших при терактах, лечившихся в стационарах, по локализации ранений/травм – по основному поражению**

Distribution of victims of terrorist acts treated in hospitals by location of wounds/injuries – by main lesion

Локализация ранения (травмы) Location of injury (trauma)	Доля пострадавших с данной локализацией, % The share of victims with this location, %
Голова /Head	16,2–19,4
Шея /Neck	2,1–4,3
Позвоночник /Spine	2,3–4,1
Грудь /Chest	10,2–13,3
Живот /Abdomen	8,1–10,5
Таз /Pelvis	1,7–3,8
Верхние конечности /Upper limbs	19,6–24,2
Нижние конечности /Lower limbs	25,7–29,8

Таблица 2/Table 2

**Распределение пострадавших при терактах, лечившихся в стационарах, по локализации ранения и степени тяжести поражения, % – среднестатистические данные**

Distribution of victims of terrorist acts treated in hospitals by location and severity of injuries, % – average statistical data

Локализация ранения Location of injury	Степень тяжести поражения /Severity of the lesion			Итого /Total
	лёгкая /light	средняя /medium	тяжелая и крайне тяжелая severe, extremely severe	
Голова /Head	37,2	40,3	22,5	100,0
Шея /Neck	42,3	37,0	20,7	100,0
Позвоночник /Spine	22,0	42,9	35,1	100,0
Грудь /Chest	30,4	37,3	32,3	100,0
Живот /Abdomen	22,4	42,3	35,3	100,0
Таз /Pelvis	34,2	35,5	30,3	100,0
Верхние конечности /Upper limbs	34,1	38,4	27,5	100,0
Нижние конечности /Lower limbs	33,8	37,5	28,7	100,0

of chronic diseases; to restore physical and mental health, they need a longer time than other categories of victims [18, 19].

The availability of data on some indicators that determine the medical and tactical characteristics of victims will make it possible, first of all, to more accurately predict an expected volume of work; to more adequately determine the need for forces and means necessary to provide victims with medical assistance and to carry out their medical evacuation at the optimal time; to alert these forces and means; to determine the procedure for their use in the conditions of liquidation of the consequences of a terrorist attack.

This information can be used: when planning the allocation and re-profiling of hospital beds; for a temporary redistribution of medical personnel and for a more reasonable use of individual specialists and expensive medical and diagnostic complexes and devices; for a more rational use of medical units and medical organizations; for substantiating the range and volume when creating reserves of medical property; for organizing the professional training of health personnel. In addition, the data obtained are necessary for the scientific development of more effective therapeutic and diagnostic technologies.

*Psychological situation, taking and holding hostages, the presence of a threat to their lives.* Any crisis situation, especially a terrorist act, is an unexpected stressful factor that causes psychological and emotional shifts in people - often with long periods of treatment - as well as a destabilization of their spiritual life [18].

The study of the experience of eliminating the consequences of terrorist attacks, especially those with a large number of victims - the explosions of residential buildings, administrative buildings, cultural and entertainment centers, taking and holding of hostages, with a long time required to eliminate their health consequences - showed that they were characterized by a powerful long-term psychological impact not only on the victims and their relatives (close ones), but also on the personnel of emergency rescue teams.

As a result, they often developed non-psychotic mental disorders (phobic experiences, "panic" neurasthenic-like affective situational reactions, anxiety), which subsequently, to one degree or another, contributed to the development of post-traumatic stress disorder.

For example, according to A.A. Portnova (2005), acute stress reactions were observed in almost all children and adolescents who were held hostage (Beslan): impaired consciousness - by the type of narrowed and twilight - in the

acute period of trauma - 40.3%; psychomotor disorders (agitation and lethargy) - in 77.4%; emotional manifestations (anxiety, fear, horror, guilt, despair) - in 98.4%. Sleep disorders predominated in the structure of other mental disorders - 96.7%; re-experiencing trauma - 95.2; fears - 91.9% and behavioral disorders - 45.2%.

It is equally important that those seriously injured in the immediate period after injury are significantly less susceptible to the traumatic effects of life-threatening events than lightly wounded (lightly injured) or those who did not have any wounds or injuries at all (S.V. Litvinsev, V.V. K. Shamrey et al., 2005). The above features must be taken into account when organizing and providing medical assistance to victims of terrorist attacks.

The experience of eliminating the consequences of terrorist attacks, especially large-scale ones, suggests that many of victims, as a rule, needed medical, psychological and psychiatric assistance. This circumstance made it necessary to organize the provision of these types of assistance to them. This is quite convincingly evidenced by the data in Table 4, characterizing medical and sanitary consequences of the explosions of houses in Moscow [12].

Medical, psychological and psychiatric assistance to victims of terrorist attacks had to be organized not only in specialized medical facilities, but also outside medical organizations - near the place of the attack in the medical center of a temporary accommodation center for victims.

The results of the analysis of elimination of medical and sanitary consequences of terrorist attacks with a large number of hostages held by terrorists for a long time, in presence of a threat to their life and health, indicate that when they were released quickly, it was necessary to ensure high level of readiness: medical units and medical personnel involved in elimination of the consequences of such terrorist attacks, should be ready to provide emergency medical assistance in a short time to a large number of victims outside the medical organization; to carry out medical evacuation in several LMOs; to simultaneously receive numerous groups of victims in these LMOs.

Such readiness can only be ensured if there is a sufficient number of ambulance teams, of emergency response teams of the SMK, of ambulance transport and of relevant LMOs, taking into account the forecast data. Undoubtedly, this also requires a clear organization and conduct of medical triage within a short period of time, an organization of the operational work of the dispatch service, an organization of the distribu-

Таблица 3/Table 3

**Распределение пострадавших при теракте в г.Беслане (2004), поступивших в лечебные учреждения, по локализации ранения и степени тяжести поражения, чел./%**

Distribution of victims of the terrorist act in Beslan (2004), admitted to medical institutions, by location and severity of injury, people/%

Локализация ранения Location of injury	Число пострадавших, чел. Number of victims, people	Степень тяжести поражения /Severity of the lesion		
		лёгкая /light	средняя /medium	тяжелая /severe
Голова /Head	108/19,7	22/4,0	63/11,5	23/42,0
Шея /Neck	16/3,1	- / -	6/1,2	10/1,9
Позвоночник /Spine	14/2,6	- / -	7/1,3	7/1,3
Грудь /Chest	75/13,7	15/2,6	33/6,2	27/4,9
Живот /Abdomen	85/15,5	20/3,5	48/8,9	17/3,1
Таз /Pelvis	3/0,5	- / -	2/0,3	1/0,2
Верхние конечности /Upper limbs	87/16,0	38/6,9	49/9,0	- / -
Нижние конечности /Lower limbs	159/28,9	58/10,5	96/17,5	5/0,9

tion of victims to hospital facilities (medical centers) and an observance of routing principles during medical evacuation.

The most typical terrorist attacks were: the seizure by terrorists of the central regional hospital in the city of Budenovsk, Stavropol Territory; the terrorist attack in Moscow ("Nord-Ost"); terrorist attack in Beslan, Republic of North Ossetia - Alania. In all these cases, there was a clear threat to life and health of the hostages.

With these terrorist attacks, there was an opportunity to more strictly plan the preparation of medical units and medical facilities, to create a reserve of medical forces and means involved in providing medical assistance to the victims and in carrying out their medical evacuation. In addition, it was necessary to very promptly interact with temporary interdepartmental management bodies (headquarters), formations of ministries, services, organizations, which held the leadership and controlled the coordination of actions in eliminating the consequences of the terrorist attack.

*Terms of elimination of medical and sanitary consequences of terrorist attacks.* In the course of the study, it was found that the organization of provision of medical care and of medical evacuation of victims was influenced to a certain extent by the timing of the elimination of the consequences of terrorist acts.

At the same time, the effectiveness of organizing life-saving and of preserving the health of victims of terrorist attacks can be evaluated based on the amount of time spent on eliminating their health consequences. At the same time, it is quite obvious that the duration of rescue operations depends on many factors: the scale of destruction; the number of victims and the nature of health consequences; the time of the day - day or night - and weather conditions; the degree of readiness of the health care system to promptly respond to such emergencies and to eliminate their consequences, etc.

The study showed that most often - 65.0–70.0% of cases - medical and sanitary consequences of terrorist attacks could be eliminated within the first 2-3 hours. However, it should be noted that the elimination of medical and sanitary consequences of 5.8 % of terrorist attacks lasted for 24 hours or more. In such cases, of course, the provision of medical assistance to the victims was late, mainly due to two circumstances - the time spent on retrieving the victims from the rubble of blown up residential buildings, administrative and other buildings, or the time spent on the negotiation process with terrorists holding hostages.

Under these circumstances, a certain number of victims of terrorist attacks got medical assistance both in pre-hospital and hospital periods after a long time from the moment of injury (trauma).

This situation must be taken into account when organizing the provision of medical care to victims in the emergency zone, during their medical evacuation and admission to medical units of SMK and LMO.

Most of time was required to eliminate medical and sanitary consequences of terrorist attacks, accompanied by armed attacks with hostage-taking, explosions of residential buildings and administrative buildings.

The experience of eliminating the consequences of terrorist attacks shows that in the interests of creating a system of medical and evacuation measures, the time spent on the negotiation process with the terrorists holding hostages should be maximized. In such cases, conditions are created for a more substantiated planning of the organization of medical assistance to victims and participants in the liquidation of the consequences of a terrorist attack, as well as for planning the organization of medical evacuation of persons in need of medical care to LMO hospitals.

In addition, it becomes possible to attract the forces and means not only of the regional, but also, if necessary, of the federal level of health care, to prepare medical units and medical facilities for the performance of the relevant tasks. Naturally, this creates conditions for a more detailed study of issues of interaction between the healthcare system, including the Disaster Medicine Service of the Russian Ministry of Health, with the services and structures involved in eliminating the consequences of a terrorist attack.

Analysis of the time spent on the elimination of medical and sanitary consequences of terrorist attacks allows us to formulate the following recommendations:

1. Knowing the probable timing of the elimination of medical and sanitary consequences of terrorist attacks makes it possible to: make more adequate decisions on the organization of medical support for victims of a terrorist attack and, first of all, on providing them with emergency medical assistance; to optimize the management activities of the healthcare management bodies and to more efficiently use medical forces and means; to purposefully prepare specialists from health authorities, medical facilities and medical units, including SMK, to work in conditions of terrorist attacks.

2. Since the forces and means of regional health play the main role in the elimination of medical and sanitary consequences of terrorist attacks, they must be in a state of constant readiness to respond to terrorist attacks and to work in difficult conditions.

Needs and capabilities of medical organizations in the region to provide medical assistance to victims of terrorist attacks. When studying the issue of the LMO's capabilities

Таблица 4/ Table 4

**Медико-санитарные последствия взрывов домов в г. Москве в 1999 г., чел., всего / в т.ч. детей**

Health consequences (people) of house explosions in Moscow in 1999, total / including children

Объект нападения террористов (место взрыва) Object of terrorist attack (place of explosion)	Число пострадавших /Number of victims, people				Ситуационно обусловленные обращения за медико-психологической помощью Situationaly determined requests for medical and psychological help		
	всего total	из них / from them:			всего total	медико-психологическая и психиатрическая помощь оказана medical and psychological and psychiatric help is provided	
		погибли lost	медицинская помощь оказана medical care is provided			в стационаре in the hospital	амбулаторно on an outpatient basis
			в стационаре in the hospital	амбулаторно on an outpatient basis			
Улица Гурьянова /Guryanov Street	236/25	88/8	86/14	62/3	665/22	15/4	650/18
Каширское шоссе /Kashira Highway	149/17	121/14	16/3	12/0	440/0	10/0	430/0



to provide medical assistance to victims of terrorist attacks, an emphasis was placed on two fundamentally important provisions.

*First provision.* The capabilities of medical units and medical facilities to provide medical assistance to victims of emergencies, as well as during terrorist attacks, are a multifactorial category and depend: on the availability of certain medical specialists in a specific period of time and on the level of their professional training; on the equipment of these medical units and medical facilities with modern medical and diagnostic devices and other types of medical property; on the number and profile of deployed hospital beds, including resuscitation beds and intensive care beds, on the number of operating rooms and dressing tables, etc.

*Second provision.* The potential of medical units and, especially, of LMOs for the provision of medical care is created, first of all, for the specific conditions of their daily activities, which include, among other things, the size and structure of the population served, its morbidity and hospitalization, as well as other characteristics, which ultimately are taken into account while elaborating organizational structure, staffing and equipment standard for a particular medical organization.

All this taken together allows us to assert that the system-forming factors that determine the capabilities of medical units and medical facilities to provide medical assistance to victims of emergencies, including terrorist attacks, are not a "rigid structure", but tend to change in one direction or another.

From the foregoing, the following conclusion can be drawn: knowledge of the characteristics of the contingent of victims of terrorist attacks (the proportion of victims who need inpatient and outpatient treatment; localization of injuries; severity of victims' condition, etc.) allows to influence to a certain extent on these factors and increase not only the quantitative, but also the qualitative potential of medical units and LMOs to provide medical care.

For example, an additional deployment of dressing and operating tables, creation of surgical teams due to the temporary redistribution of regular medical workers and their provision with a necessary medical equipment, instruments and medicines made it possible to increase the capabilities of medical facilities to provide medical care to victims of surgical profile, and the strengthening of medical equipment by teams of specialized medical care increased the possibilities of provision of specialized medical care to victims of a relevant profile.

When studying the hospitalization of victims of terrorist attacks, it was found that most of the hospitalized were in the Kabardino-Balkarian Republic (100.0%), the Astrakhan region (92.2%), the Republic of Ingushetia (86.1%) and the Krasnodar Territory (80.0%). At the same time, the proportion of victims whose treatment was carried out on an outpatient basis was the highest in the Moscow (93.8%) and Rostov (86.9%) regions, the Chechen Republic (50.2%) and the Stavropol Territory (40.3%). There are fairly strong reasons to assert that in those regions in which the proportion of hospitalized was the largest, there were cases of unjustified hospitalization.

So, for example, according to the data of the territorial centers of disaster medicine, in the Astrakhan region and the Republic of Ingushetia, the proportion of victims with minor injuries was 61.4 and 27.3%, respectively. It is unlikely that most of them required hospitalization.

The number of victims who needed, first of all, inpatient treatment, their diverse structure, taking into account the location and severity of injury (trauma), often determined the need to send victims from the scene of a terrorist attack to several medical facilities and, above all, to multidisciplinary city hospitals. Such an organizational solution was possible only because terrorist attacks, as noted above, were mainly carried out in cities.

Taking into account the relevance of the problem under study, the authors consider it advisable to once again draw the attention of medical specialists to the practical side of this circumstance, which requires: maintaining a high readiness for the simultaneous admission of a large number of victims to several medical facilities - preferably of the 2nd and 3rd level; well-coordinated operational work of the dispatch service, capable in a short time to solve tasks for the targeted distribution of victims between the LMOs, including those of the federal level, located on the territory of the region, as well as to manage SMP and SMK teams; to quickly determine several routes (ways) of medical evacuation of victims from the most probable emergency zones to LMOs and to coordinate it with the relevant territorial structures of the traffic police.

In the course of the study, it was required to determine in which medical departments of LMO the victims of terrorist attacks were most often treated. It turned out that the highest workload was carried, as a rule, by the traumatological, general surgical and neurosurgical departments, as well as by the departments of thoracoabdominal surgery. It follows from this that the heads of these departments need to pay more attention to preparing for the reception and provision of medical assistance to victims of terrorist attacks.

The study found that medical organizations directly subordinated to the Ministry of Health of Russia and to the Russian Academy of Sciences received a minor number of victims of terrorist attacks - 5.9 and 1.6%, respectively.

This treatment and evacuation characteristics of victims of terrorist attacks convincingly testify that the wounds and injuries were difficult and severe, so, many victims needed specialized, including high-tech, medical care. It can also be assumed that the intensity of the use of federal LMOs in the elimination of medical and sanitary consequences of terrorist attacks was not optimal. This provision should be taken into account not only when organizing medical support for the population in emergencies of natural and man-made genesis, but also during various terrorist attacks, and also, if necessary, to involve the indicated LMOs, especially those located in the region, and teams of specialized medical care formed on the basis of these LMOs to the elimination of medical and health consequences of such events.

Needs and capabilities of medical organizations of the region for medical evacuation. An important element of the system for organizing the provision of medical care to victims of emergencies, including during terrorist attacks, is the organization of medical evacuation in compliance with the routing principles, first of all - from the place of emergency to one or several medical facilities.

There is no doubt that the quality of medical evacuation and, above all, the timeliness of transportation of victims to appropriate medical treatment facilities, largely depends on the number of ambulance vehicles - SMP vehicles and ambulances, as well as helicopters involved for these purposes.

In this regard, when carrying out the study, it was quite natural that it became necessary to study the issue of a sufficient number of ambulance vehicles and of the intensity of their use. It turned out that when eliminating medical and sanitary consequences of terrorist attacks in large cities with a developed health infrastructure (Moscow, St. Petersburg, the capitals of the republics, regional and regional centers), it is quite realistic to send a sufficient number of ambulances, including reanimobiles, to the area of a terrorist attack.

However, a completely different situation is presented in municipalities, where the number of ambulances was not so big.

For example, when an explosion took place in the city of Nevinnomyssk, Stavropol Territory, at a bus stop near the market (06.10.2000), 12 ambulances were brought in for medical evacuation of 67 victims to the central district hospitals (CRH); when a car was blown up in the city of Pyatigorsk (08.12.2000), the evacuation of 28 victims to the city hospital was carried out by 7 ambulances. These examples indicate that during the elimination of the consequences of these and similar terrorist attacks - rapid emergencies \*, when an explosion took place in an open area, there are not a very large number of victims and it takes a short time to carry out medical triage and provide, if necessary, medical assistance in an emergency form to those injured at the scene of an emergency - ambulances should be sent to the area of the terrorist attack in the maximum number. The best option is if their number corresponds to the predicted number of victims requiring hospitalization. This is due to the fact that with such terrorist attacks it becomes possible to organize almost one-step medical evacuation of victims to one or several medical facilities.

The experience of eliminating the consequences of terrorist attacks shows that often the health care system in municipalities has limited opportunities for a. simultaneous allocation of an optimal number of ambulances for medical evacuation of victims. Therefore, in case of terrorist attacks, accompanied by numerous sanitary losses, it is necessary to attract SMP vehicles from neighboring municipalities.

When creating regional centers for emergency medical care and medical care, intermunicipal medical centers (MMC), it is necessary to provide them with sanitary and transport units that have great capabilities to conduct high-quality medical evacuation of a large number of victims in a short time.

Hostage-taking and terrorist attacks are not a rapid emergency. However, the experience of eliminating their consequences and the results of the study show that when the hostages were released, it became necessary to quickly evacuate a large number of victims to hospital facilities, as was the case during the elimination of the consequences of the terrorist attacks in Moscow (Nord-Ost, 2002) and Beslan (2004).

As for the terrorist attacks with the explosion of residential buildings, buildings of administrative and commercial organizations, accompanied by destruction of varying degrees, when it takes a long time to search for and to release the victims from the rubble, in such cases, with the exception of the initial stage of liquidation of the consequences of an emergency, there was no need to use the maximum number of ambulance vehicles.

This position is to some extent confirmed by the data in table 5, from which it can be seen that the time spent on the elimination of medical and sanitary consequences of ter-

rorist attacks at the indicated facilities allowed ambulances to perform 2 or more flights to deliver victims to the LMO. In such terrorist attacks, as a rule, at least 50-60 ambulances are required per 100 victims who need hospital treatment.

Of course, this ratio cannot be absolutized. It should be considered only as an approximate indicator that can be used for operational calculations when planning and deciding on the organization of medical assistance to victims and their medical evacuation within terrorist attacks.

Features of the organization and implementation of measures to eliminate the consequences of a terrorist act. Management bodies, formations, organizations and services of different ministries took part in eliminating the consequences of terrorist attacks, analysed in this study, solving tasks within their powers and competencies, regulated by: Federal laws of the Russian Federation of 25 July 1998 No. 130-FZ and dated March 6, 2006 No. 35-FZ; By the Decree of the President of the Russian Federation dated February 15, 2006 No. 116 and other regulatory legal acts. In this regard, when conducting the study, one important circumstance should be taken into account. These structures solve the tasks assigned to them, as a rule, in a strictly confidential mode of operation where there is a limited volume of exchange of information about the activities they carry out. This did not always contribute to the creation of optimal conditions for organizing and carrying out medical and evacuation measures in eliminating the consequences of terrorist attacks.

The general leadership and coordination of activities of those forces involved in eliminating the consequences of such terrorist attacks was carried out by specialists from the FSB of Russia. When eliminating the consequences of each terrorist attack, an interdepartmental management body (headquarters) was created, which included representatives of public health authorities and of the Disaster Medicine Service of the Russian Ministry of Health.

It follows from this that in order to effectively and efficiently solve the tasks of saving lives and preserving the health of victims, health authorities, medical units and organizations involved in eliminating the consequences of terrorist attacks must interact with the subjects countering terrorism \*. And this, in turn, requires the development of order and schemes of interaction in such emergencies, their verification and improvement in the process of conducting joint special exercises and trainings.

It should not be overlooked that in the zone of liquidation of the consequences of a large-scale terrorist attack, conventional means of communication, including mobile ones, do not work. Therefore, the medical units sent to the area of a terrorist attack as well as operational groups of health authorities must be equipped with modern, appropriate to the working conditions, radio communications. The organization and frequencies of radio communication must be coordinated with the structures of the FSB of Russia and with other entities participating in the elimination of the consequences of a terrorist attack.

The results of the study allow us to assert that the organization of the provision of medical care and the conduct of medical evacuation in terrorist attacks carried out with the use of explosive devices and conventional weapons is influenced by various conditions and factors that can be divided into 3 groups: the first group - con-

ditions and factors directly related to health care - needs and opportunities for the provision of medical care and medical evacuation, sanitary losses and psychological environment; the second group - factors conditioned by the activity of the general system of liquidation of the consequences of a terrorist attack - the peculiarities of the organization and implementation of measures, the duration of liquidation of the consequences of a terrorist attack; the third group - conditions and factors due to the characteristics of a terrorist act - the means of conducting terrorist activities, the nature of the object at which the terrorist act was committed, the vulnerability of the population.

According to the authors, when the conditions and factors are distributed to such groups, favorable opportunities are created: for the development of clearer algorithms for the actions of the relevant specialists of health authorities, of medical organizations and formations in solving the tasks assigned to them to organize the provision of medical care and to conduct medical evacuation; for conducting a comprehensive assessment and systematic analysis of the medical and tactical situation that has developed as a result of a terrorist attack and for developing clear and more substantiated proposals for creating a system of medical and evacuation measures; for determining an op-

timal forecast of work and rational planning of appropriate treatment and evacuation measures, linked to the general system for eliminating the consequences of terrorist attacks; for a more adequate use and management of the medical forces and means involved in the elimination of medical and sanitary consequences of terrorist attacks, as well as for the management of the provision of medical care and the conduct of medical evacuation.

### Conclusions

1. The organization of medical care and medical evacuation during the elimination of medical and sanitary consequences of terrorist attacks with the use of explosive devices and conventional means of destruction is influenced by various conditions and factors, the main of which are: means of conducting terrorist activities and features of their use; high degree of vulnerability and damage to people; the nature of the object on which the terrorist attack was carried out, and its location relative to a large settlement with a well-developed health-care infrastructure; sanitary losses and their medical and evacuation characteristics; psychological situation, holding of hostages, the presence of a threat to their lives; terms of elimination of medical and sanitary consequences; the needs and capabilities of the regional LMO for the provision of medical care and medical evacuation; features of the organization and

Таблица 5/Table 5

#### Ликвидация медико-санитарных последствий террористических актов – взрывов жилых домов и административных зданий

Elimination of medical and sanitary consequences of terrorist acts with explosions of residential houses and administrative buildings

Место и дата совершения теракта The place and date of terrorist attack	Число госпитализированных, чел. Number of hospitalized, people	Количество санитарных машин, привлекавшихся при ликвидации последствий теракта, абс. Number of ambulances involved in the aftermath of the terrorist attack, abs.	Время, затраченное на ликвидацию медико-санитарных последствий теракта, ч Time spent on eliminating the health consequences of a terrorist attack, hours
г.Москва, ул. Гурьянова – взрыв жилого дома, 09.09.1999 City of Moscow, Gur'yanov Street – explosion in a residential building 09.09.1999	73	70	72
г.Москва, Каширское шоссе – взрыв жилого дома, 13.09.1999 City of Moscow, Kashira Hwy – explosion in a residential building 13.09.1999	16	77	62
Республика Дагестан, г.Буйнакс – взрыв жилого дома, 04.09.1999 г. Republic of Dagestan, Buynaksk – explosion in a residential building 04.09.1999	91	23	6
Республика Дагестан, г.Махачкала – взрыв жилого дома, 07.09.1999 Republic of Dagestan, Makhachkala – explosion in a residential building 07.09.1999	144	15	12
Республика Дагестан, г.Каспийск – взрыв жилого дома, 07.11.1999 Republic of Dagestan, Kaspiysk – explosion in a residential building 07.09.1999	49	13	9
Чеченская Республика, г.Грозный – подрыв административного здания Правительства республики, 27.12.2002 Chechen Republic, Groznyy – explosion in the administrative building of the government of the Republic, 27.12.2002	191	52	51
Чеченская Республика, с.Знаменское – взрыв жилого дома, 12.05.2003 Chechen Republic, Znamenskoe – explosion in a residential building 12.05.2003	148	40	56
Чеченская Республика, г.Грозный – подрыв здания РУОПа, 20.06.2003 Chechen Republic, Groznyy – explosion in Regional office for combating organized crime, 20.06.2003	31	5	1
Чеченская Республика, г.Грозный – подрыв здания МВД республики, 13.09.2005 Chechen Republic, Groznyy – explosion in the building of the Ministry of Internal Affairs of the Republic, 13.09.2005	8	4	2

implementation of a general set of measures to eliminate the consequences of a particular terrorist attack.

Specialists of healthcare authorities and disaster medicine should be aware of these conditions and factors and skillfully take into account their possible impact on the content and features of the healthcare system, primarily in the relevant region, when organizing and implementing medical and evacuation measures during the elimination of the consequences of terrorist attacks.

2. A variety of conditions and factors affecting the health care activities during the elimination of the consequences of terrorist attacks, exclude a stereotyped approach in solving problems of providing medical care and conducting medical evacuation, require the development of multivariate schemes for medical and evacuation measures and a high level of competence of the relevant specialists on work of medical units, medical equipment and medical transport.

3. Based on a retrospective analysis of the experience of

eliminating medical and sanitary consequences of terrorist attacks, analysis of the main conditions and factors affecting the organization of medical care and medical evacuation, methodological approaches are proposed: to a comprehensive assessment of the conditions and factors that occur during terrorist attacks using explosive devices and conventional means of destruction, which should be taken into account when creating a system of medical and evacuation measures in the framework of eliminating the consequences of terrorist attacks; to the use of medical and evacuation characteristics of victims in the organization of medical care and medical evacuation; to improve the preparedness of the health care sector of the regions for response and actions in the elimination of medical and sanitary consequences of terrorist attacks.

The implementation of these methodological approaches will allow achieving better results in the provision of medical care to victims of terrorist attacks.

## REFERENCES

1. On Counter-Terrorism. Federal Law of the Russian Federation dated July 25, 1998, No. 130-FZ (In Russ.).
2. Countering Terrorism. Federal Law of the Russian Federation dated March 6, 2006, No. 35-FZ. (In Russ.).
3. On counter-terrorism measures. Decree of the Government of the Russian Federation dated September 15, 1999, No. 1040 (In Russ.).
4. Ilyin E.P. System of Countering the Ideology of Terrorism in the Russian Federation: The Formation and Perspective of Development. National Anti-Terrorism Committee Herald. *Vestnik Natsionalnogo Antiterroristicheskogo Komiteta*. 2010; 2: 21-27 (In Russ.).
5. Mikryukov V. Terrorism as a Social Phenomenon. *Grazhdanskaya Zashchita*. 2008; 6: 38-40 (In Russ.).
6. Aleksanin S.S., Magdich I.A., Petrov V.P., Sukhoterlin D.M., Rybnikov V.Yu., Pyatibrat A.O. Metro Disasters: Characteristics of Sanitary and Irretrievable Losses Depending on Type and Conditions of Emergency Occurrence. *Meditsina Katastrof = Disaster Medicine*. 2020; 1: 33-37 (In Russ.).
7. Bobiy B.V., Avramenko V.A. Some Features of Terrorist Acts and Their Impact on Health Care Activities. *Meditsina Katastrof = Disaster Medicine*. 2008; 1: 15-17 (In Russ.).
8. Teague DC. Mass casualties in the Oklahoma City bombing. *Clin Orthop* 2004; 422: 77-81.
9. Fisun A.Ya., Samokhvalov I.M., Boykov A.A., Parfyonov V.E., Badalov V.I., Kipor G.V. Liquidation of Medical and Sanitary Consequences of Terrorist Act: Event's Chronology and Clinic of Injuries. *Meditsina Katastrof = Disaster Medicine*. 2018; 2: 22-24 (In Russ.).
10. Lukyanchuk E.M. Organizatsionnye aspekty likvidatsii meditsinskikh posledstviy pri kriminalnykh vzryvakh v usloviyakh goroda Moskvy = Organizational aspects of the elimination of medical consequences in criminal explosions in the city of Moscow. Doctor's thesis in Medicine. Moscow Publ., 1999, 148 p. (In Russ.).
11. Anisina A.V., Denisov A.V., Shapovalov V.M. Assessment of Mine-Explosive Injury of the Lower Extremities. *Vestnik Rossiyskoy Voenno-Meditsinskoy Akademii = Bulletin of the Russian Military Medical Academy*. 2009; 2: 215-218 (In Russ.).
12. Kostomarov L.G., Stazhadze L.L., Spiridonova E.A. Clinical and Organizational Aspects of The Elimination of Medical Consequences of Terrorist Acts. *Meditsina Kriticheskikh Sostoyaniy*. 2004; 5: 3-22 (In Russ.).
13. Goncharov S.F., Kryukov A.P., Kryukov V.I. et al. Organization of Medical Support of those affected by the terrorist attack in Beslan. *Meditsina Katastrof = Disaster Medicine*. 2004; 3-4: 13 (In Russ.).
14. Trukhan A.P., Samokhvalov I.M., Skakunova T.Yu., Ryadnov A.A. Structure of Injuries in Victims with Peacetime Explosive Trauma: Terrorist Attack in Saint Petersburg metro on April 3, 2017. *Meditsina Katastrof = Disaster Medicine*. 2020; 2: 29-31 (In Russ.).
15. Zaporozhets A., Hapalov E., Chumak S. Terrorist Attacks in the Cities of New York and Washington and the Specifics of their Aftermath. *Grazhdanskaya Zashchita*. 2002; 9: 20-23 (In Russ.).
16. Baranova N.N., Baryshev S.B., Goncharov S.F., Isaeva I.V., Titov I.G., Chubayko V.G. Problems of Organizing and Conducting Medical Evacuation in Emergency Situations with Large Numbers of Victims. *Meditsina Katastrof = Disaster Medicine*. 2020; 2: 52-61 (In Russ.).
17. Agadzhanian V.V., Ustyantseva I.M., Pronsky A.A. et al. Politravma. Neotlozhnaya Pomoshch i Transportirovka = Politrauma. Emergency Care and Transportation. Novosibirsk, Nauka Publ., 2008, 231 p. (In Russ.).
18. Kokhanov V.P., Krasnov V.N. *Psikhiatriya Katastrof i Chrezvychaynykh Situatsiy = Psychiatry of Disasters and Emergencies*. Moscow, Prakticheskaya Meditsina Publ., 2008, 448 p. (In Russ.).
19. Goncharov S.F., Bobiy B.V. *Meditsinskoe Obespechenie Naseleniya pri Terroristicheskikh Aktakh = Health Care for the Population in the Time of Terrorist Acts*. Medical Study Guide. Moscow, VTSMK Zashchita Publ., 2016. 79 p. (In Russ.).

## СПИСОК ЛИТЕРАТУРЫ

1. О борьбе с терроризмом: Федеральный закон Российской Федерации от 25 июля 1998 г. №130-ФЗ.
2. О противодействии терроризму: Федеральный закон Российской Федерации от 6 марта 2006 г. №35-ФЗ.
3. О мерах противодействия терроризму: Постановление Правительства Российской Федерации от 15 сентября 1999 г. № 1040.
4. Ильин Е.П. Система противодействия идеологии терроризма в Российской Федерации: становление и перспектива развития // Вестник национального антитеррористического комитета. 2010. №2. С.21-27.
5. Микрюков В. Терроризм как социальное явление // Гражданская защита. 2008. №6. С.38-40.
6. Алексанин С.С., Магдач И.А., Петров В.П., Сухотерин Д.М., Рыбников В.Ю., Пятибрат А.О. Катастрофы в метро: характеристика санитарных и безвозвратных потерь в зависимости от вида и условий возникновения чрезвычайной ситуации // Медицина катастроф. 2020. №1. С.33-37.
7. Бобий Б.В., Авраменко В.А. Некоторые особенности террористических актов и их влияние на деятельность здравоохранения // Медицина катастроф. 2008. №1. С.15-17.
8. Teague DC. Mass casualties in the Oklahoma City bombing. *Clin Orthop* 2004; 422: 77-81.
9. Фисун А.Я., Самохвалов И.М., Бойков А.А., Парфенов В.Е., Бодалов В.И., Кипор Г.В. Ликвидация медико-санитарных последствий террористического акта: хронология события и клиника поражений // Медицина катастроф. 2018. №2. С.22-24.
10. Лукьянчук Э.М. Организационные аспекты ликвидации медицинских последствий при криминальных взрывах в условиях города Москвы: Дис...канд. мед. наук. М., 1999. 148 с.
11. Анисин А.В., Денисов А.В., Шаповалов В.М. Оценка минно-взрывной травмы нижних конечностей // Вестник Российской военно-медицинской академии. 2009. №2. С.215-218.
12. Костомарова Л.Г., Стажадзе Л.Л., Спиридонова Е.А. Клинические и организационные аспекты ликвидации медицинских последствий террористических актов // Медицина критических состояний. 2004. №5. С.3-22.
13. Гончаров С.Ф., Крюков А.П., Крюков В.И. и др. Организация медицинского обеспечения пораженных при террористическом акте в Беслане // Медицина катастроф. 2004. №3-4. С.13.
14. Трухан А.П., Самохвалов И.М., Скакунова Т.Ю., Ряднов А.А. Структура повреждений у пострадавших со взрывной травмой мирного времени: террористический акт в метро Санкт-Петербурга 3 апреля 2017 г. // Медицина катастроф. 2020. №2. С.29-31.
15. Запорожец А., Халалов Е., Чумак С. Террористические акты в городах Нью-Йорк и Вашингтон и особенности ликвидации их последствий // Гражданская защита. 2002. №9. С.20-23.
16. Баранова Н.Н., Гончаров С.Ф., Титов И.Г., Барышев С.Б., Исаева И.В., Чубайко В.Г. Проблемы организации и проведения медицинской эвакуации в чрезвычайных ситуациях с большим числом пострадавших // Медицина катастроф. 2020. №2. С.52-61.
17. Агаджанян В.В., Устьянцева И.М., Пронский А.А. и др. Политравма. Неотложная помощь и транспортировка. Новосибирск: Наука, 2008. 231 с.
18. Коханов В.П., Краснов В.Н. Психиатрия катастроф и чрезвычайных ситуаций. М.: Практическая медицина, 2008. 448 с.
19. Гончаров С.Ф., Бобий Б.В. Медицинское обеспечение населения при террористических актах: Учебное пособие для врачей. М.: ФГБУ ВЦМК «Защита», 2016. 79 с.

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