

# ACTUAL PROBLEMS OF MEDICAL EVACUATION АКТУАЛЬНЫЕ ПРОБЛЕМЫ МЕДИЦИНСКОЙ ЭВАКУАЦИИ

<https://doi.org/10.33266/2070-1004-2022-4-53-57>  
УДК 614.883

Оригинальная статья  
© ФМБЦ им.А.И.Бурназяна

## ОСОБЕННОСТИ ПРОВЕДЕНИЯ МЕДИЦИНСКОЙ ЭВАКУАЦИИ ПАЦИЕНТОВ В УСЛОВИЯХ ВРЕМЕННОГО ОГРАНИЧЕНИЯ НА ФЕДЕРАЛЬНОМ УРОВНЕ ПОЛЕТОВ ГРАЖДАНСКОЙ АВИАЦИИ, В ТОМ ЧИСЛЕ ИЗ-ЗА РУБЕЖА

Н.А.Качанова<sup>1</sup>

<sup>1</sup> ФГБУ «ГНЦ – Федеральный медицинский биофизический центр им. А.И.Бурназяна» ФМБА России, Москва, Россия

**Резюме.** Цель исследования – проанализировать и обосновать альтернативные пути решения проблемных вопросов медицинской эвакуации больных и пострадавших в условиях временного ограничения полетов гражданской авиации.

**Материалы и методы исследования.** Материалы исследования: практический опыт специалистов Центра санитарной авиации и скорой медицинской помощи (ЦСА и СМП) ВЦМК «Защита» ФГБУ «ГНЦ – Федеральный медицинский биофизический центр им. А.И.Бурназяна» ФМБА России, а также ООО «Медэеро-Сервис»; статистические данные о выездной работе бригад ЦСА и СМП в части проведения медицинской эвакуации пациентов с территории зон закрытого воздушного пространства; данные официальных сайтов: Федерального агентства воздушного транспорта, Правительства, Министерства иностранных дел, Министерства транспорта Российской Федерации; Пограничной службы ФСБ России; Федерального агентства по туризму, ассистанских компаний; электронная база нормативных правовых документов.

**Методы исследования:** аналитический, метод непосредственного наблюдения, сравнение, описание.

**Результаты исследования и их анализ.** Представлены результаты исследования, характеризующие проблемные вопросы медицинской эвакуации больных и пострадавших в условиях режима временного ограничения полетов гражданской авиации. Предложены и обоснованы основные пути оптимизации системы медицинской эвакуации больных и пострадавших на федеральном уровне в период ограничения авиасообщений.

**Ключевые слова:** временное ограничение полетов гражданской авиации, маршрутизация, медицинская помощь, медицинская эвакуация, медицинская эвакуация из-за рубежа, межведомственное взаимодействие, пациенты, санитарная авиация, санитарно-авиационная эвакуация, скорая, в том числе скорая специализированная, медицинская помощь, специальная военная операция, страхование выезжающих за рубеж, Федеральное медико-биологическое агентство

**Для цитирования:** Качанова Н.А. Особенности проведения медицинской эвакуации пациентов в условиях временного ограничения на федеральном уровне полетов гражданской авиации, в том числе из-за рубежа // Медицина катастроф. 2022. №4. С. 53-57. <https://doi.org/10.33266/2070-1004-2022-4-53-57>

<https://doi.org/10.33266/2070-1004-2022-4-53-57>  
UDC 614.883

Original article  
© Burnasyan FMBC FMBA

## PECULIARITIES OF MEDICAL EVACUATION OF PATIENTS UNDER CONDITIONS OF TEMPORARY RESTRICTIONS OF CIVIL AVIATION FLIGHTS, INCLUDING FROM ABROAD, AT THE FEDERAL LEVEL

N.A.Kachanova<sup>1</sup>

<sup>1</sup> State Research Center – Burnasyan Federal Medical Biophysical Center of Federal Medical Biological Agency, Moscow, Russian Federation

**Summary.** The aim of the study is to analyze and to substantiate alternative ways of solving problematic issues of medical evacuation of patients and casualties in conditions of temporary restriction of civil aviation flights.

**Materials and research methods.** Materials of the study: practical experience of the specialists of the Center of sanitary aviation and emergency medical care of "Zashchita" Disaster Medicine Center of Federal Medical Biophysical Center named after A.I.Burnazyan of the Federal Medical and Biological Agency of Russia, as well as LLC "Medaero-Service"; statistical data on the field work of teams of the Center of sanitary aviation and emergency medical care on medical evacuation of patients from closed airspace areas; data from the official websites of the Federal Air Transport Agency, of Government and Ministry of Foreign Affairs of the Russian Federation, of Border Service, of Federal Tourism Agency, and assistance companies; electronic database of regulatory legal documents.

**Research methods:** analytical, method of direct observation, comparison, description.

**Results of the study and their analysis.** Results of the study, characterizing the problematic issues of medical evacuation of patients and victims in conditions of temporary restriction of civil aviation flights regime, are presented. The main ways of optimization of medical evacuation of patients and victims at the federal level during the period of air traffic limitation have been suggested and substantiated.

**Key words:** *air ambulance, air ambulance evacuation, emergency, Federal Medical and Biological Agency, including specialized emergency medical assistance, interdepartmental interaction, insurance of those traveling abroad, medical assistance, medical evacuation, medical evacuation from abroad, patients, routing, special military operation, temporary restriction of civil aviation flights*

**For citation:** *Kachanova N.A. Peculiarities of Medical Evacuation of Patients under Conditions of Temporary Restrictions of Civil Aviation Flights, Including from Abroad, at the Federal Level. Meditsina Katastrof = Disaster Medicine. 2022;4:53-57 (In Russ.). <https://doi.org/10.33266/2070-1004-2022-4-53-57>*

**Контактная информация:**

**Качанова Наталья Александровна** – зав. оперативно-диспетчерским отделением, врач скорой мед. помощи Центра санитарной авиации и скорой мед. помощи ВЦМК «Защита» ГНЦ – ФМБЦ им. А.И.Бурназяна ФМБА России  
**Адрес:** Россия, 123182, Москва, ул. Щукинская, д. 5;  
**Тел.:** +7 (925) 345-01-13  
**E-mail:** nkachanova@fmbcfmba.ru

**Contact information:**

**Natalia A. Kachanova** – Head of the Operational Dispatch Department, Emergency Medical Doctor of the Center for Air Ambulance and Emergency Medical Care of VTsMK «Zashchita» of Burnazyan FMBC of FMBA of Russia  
**Address:** 5, Shchukinskaya str., Moscow, 123182, Russia  
**Phone:** +7 (925) 345-01-13  
**E-mail:** nkachanova@fmbcfmba.ru

## Introduction

Topicality of the research. Due to the special military operation in Ukraine, February 24, 2022, the regime of temporary restrictions of civil aviation flights was introduced — domestic flights to the regions of Southern and Central Russia were suspended and 11 Russian airports in Simferopol, Krasnodar, Rostov-on-Don, Anapa, Gelendzhik, Voronezh, Bryansk, Belgorod, Lipetsk, Elista, Kursk were closed. The Federal Air Transport Agency (Rosaviatsia)<sup>1</sup> has recommended airlines to carry passengers on alternative routes, using the airports of Sochi, Volgograd, Mineralnye Vody, Stavropol and Moscow.

By order of the Federal Air Transport Agency, flights to a number of foreign countries by Russian carriers whose aircraft are leased by foreign companies have been cancelled<sup>2,3</sup> due to the risk of their arrest because of sanctions, as well as due to the closure of the airspace of the European Union, Great Britain, the USA, Canada and Latin American countries.

Under the circumstances, it has become either completely impossible or extremely difficult to perform air ambulance evacuations of patients on the aforementioned routes.

The duration of the restrictive measures imposed to terminate flights both to southern and central Russia and to a number of foreign countries depends on the current geopolitical situation and cannot be predicted. To solve the issues of medical evacuation of patients and injured people at the federal level in the above direc-

tions requires a search for alternative ways of medical evacuation of patients using ground modes of transport and appropriate routes.

**The purpose of the study** is to analyze and to substantiate the alternative ways of solving the problematic issues of medical evacuation of patients and injured under the conditions of the introduced regime of temporary restrictions on civil aviation flights.

**Materials and research methods.** Materials: practical experience of the specialists of the Center of sanitary aviation and air ambulance of the All-Russian Center for Disaster Medicine "Zashchita" of "Federal Medical Biophysical Center named after A.I. Burnazyan" of FMBA of Russia, as well as of LLC "Medaero-Service"; statistical data on the field work of the Center of sanitary aviation and air ambulance teams in the medical evacuation of patients from the areas of closed airspace; data of official websites of the Federal Air Transport Agency, Government and Ministry of Foreign Affairs of the Russian Federation

**Research methods:** analytical, direct observation method, comparison and description.

**Results of the study and their analysis.** The regime of temporary flight restrictions not only stopped air traffic in these areas, but also changed the flight routes of aircrafts. Taking into account the necessity of flying around the restricted zone, the flight time in the southern directions increased by 2-3 hours.

Thus, before restrictions were introduced, flight time on Sochi — Moscow route was about 2 hours 30 minutes and now it is about 4 hours 30 minutes, from Istanbul (Turkish Republic) to Moscow — 1 hour 40 minutes, now — 5 hours 30 minutes, from Sharm el-Sheikh (Egypt) to Moscow: before restrictions — 3 hours, now — 6-7 hours.

The increase in flight time also implies additional technical stops for refueling of short- and medium-range planes, taking into account airport operating procedures, which leads to the risk of complications for patients related to takeoff and landing, disconnection of onboard power supplies during stops, and the need to have appropriate supplies of oxygen support for the duration of these stops.

<sup>1</sup> Information of the Federal Air Transport Agency of August 3, 2022 "The regime of temporary flight restrictions to Russian airports in southern and central Russia has been extended" [Electronic resource]. URL: <https://www.garant.ru/hotlaw/federal/1558198/#review>

<sup>2</sup> On approval of peculiarities of financial leasing contracts, contracts of lease of foreign aircraft used for flights by persons referred to in paragraph 3 of Article 61 of the Air Code of the Russian Federation, aircraft engines in 2022: Decree of the Government of the Russian Federation of 19.03.2022 № 412.

<sup>3</sup> On peculiarities of state registration of civil aircraft intended for flight in the State Register of Civil Aircraft of the Russian Federation and peculiarities of state registration of rights to aircraft and transactions with them: Decree of the Government of the Russian Federation of 19.03.2022 №411.

In addition, air travel restrictions have been imposed worldwide over the past two years as part of preventive measures against the spread of a new coronavirus infection [1, 2]. In the Russian Federation, such restrictions were, in particular: Decree of the Chief State Sanitary Doctor of the Russian Federation No. 2 of January 24, 2020; Decree of the Government of the Russian Federation No. 763-r of March 27, 2020 (revised on June 28, 2022); Decree of the Chief State Sanitary Doctor of the Russian Federation No. 18<sup>4-6</sup> of June 20, 2022.

The partially acting restrictive measures in the field of air travel related to preventing the spread of COVID-19 were overlaid by new restrictions related to a special military operation, which led to difficulties in conducting air ambulance evacuations of patients from the civilian population. It should be noted that the problems of organizing and conducting medical evacuations concern both public and private healthcare systems [3].

The need of civilian population for medical evacuations, including those to the federal centers of Moscow and St. Petersburg, still persists in such profiles as cardiac surgery, traumatology, neurosurgery, transplantation, neonatology, etc.

The main categories of patients in need of medical evacuation from south and central Russia:

- patients in need of specialized, including high-tech, medical care;
- patients after specialized treatment who need medical care during their evacuation to their region;
- palliative patients who need to be evacuated to a medical organization in the region where they are registered;
- other cases.

Medical evacuations by international referrals are needed:

- patients who fell ill or were injured during their temporary stay on the territory of a foreign country and need to be transported to Russia under medical conditions;
- patients who require specialized treatment abroad, including those under federal programs.

In the Southern and Central Federal Districts, patients in the territory and facilities served by the Federal Medical and Biological Agency, in accordance with the principles of routing, also require medical evacuation to departmental (FMBA of Russia) specialized medical institutions of Moscow and St. Petersburg — A.I. Burnazyan Federal State Research Center of the Federal Biological Center, Federal Brain and Neurotechnology Cen-

ter, Federal Scientific Clinical Center for Specialized Medical Care and Medical Technologies, Clinical Hospital No. 85, Federal Scientific Clinical Center for Children and Adolescents, L.G. Sokolov Clinical Hospital No. 122, Russian Research Institute of Hematology and Transfusiology, Children's Research and Clinical Center of Infectious Diseases and other medical institutions of FMBA of Russia.

In the current circumstances, there is a need to search for alternative logistical solutions for the medical evacuation of patients by ground transport — in reanimobiles or rail transport — as it is the only possible option for evacuating patients and victims in restricted areas.

Thus, medical evacuation of patients from Simferopol, Sevastopol, Anapa, and Novorossiysk to Moscow can be performed in sanitary vehicles. For example, the medical evacuation of patients from Sevastopol to Moscow by ambulance directly in terms of time (20-24 hours) and organizational activities will be more efficient than the stage evacuation through cities with open airports (for example, Stavropol or Sochi), taking into account the subsequent 4-5-hour flight by Boeing, Sukhoi Superjet or Airbus, and 8-9-hour flight by Yak-40 or Pilatus Aircraft-12.

Medical evacuation of a patient along the same route Simferopol-Moscow using air transport includes the following stages:

- transportation of a patient by land to Sochi or Stavropol — 12 hours;
- waiting at the airport of one of these cities and transferring a patient from an ambulance to an aircraft — 1-2 hrs;
- Air ambulance evacuation of a patient from Sochi or Stavropol to Moscow — flight time 4-7 hours;
- transfer of a patient from an aircraft to a resuscitation ambulance; time required to change vehicles — 1-2 hrs.

The advantages of using ambulances in this case are: absence of medical evacuation stages and absence of the need for bed-to-bed transition of the patient; a simplified procedure of organizational evacuation; time efficiency in medical evacuation. Patients in severe and extremely severe conditions requiring oxygen support and a considerable supply of oxygen are to be evacuated under these conditions.

The use of railroad transportation for medical evacuation will be reasonable for "planned" patients who are of moderate severity and do not require a large amount of oxygen support.

Negative aspects of the use of railway transport:

- in some cases, there is a lack of prompt redemption of train tickets for the medical team and patient;
- duration of medical evacuations, e.g. the travel time from Sevastopol to Moscow is 28-36 h;
- lack of possibility to stop the train to perform necessary manipulations, to refill oxygen cylinders or to hospitalize a patient in a medical treatment institution due to deterioration of his/her condition;

<sup>4</sup> On additional measures to prevent entry and spread of a new coronavirus infection caused by 2019-nCoV: Decree of the Chief State Sanitary Doctor of the Russian Federation of 24.01.2020 No. 2

<sup>5</sup> On temporary restriction of traffic through road, rail, pedestrian, river and mixed checkpoints across the state border of the Russian Federation, as well as through the land section of the Russian-Belarusian state border: Decree of the Government of the Russian Federation No. 763-r of 27.03.2020 (revised on 28.06.2022)

<sup>6</sup> On Certain Provisions of the Resolution of the Chief State Sanitary Doctor of the Russian Federation on Issues Related to the Spread of New Coronavirus Infection (COVID-19): Decree of the Chief State Sanitary Doctor of the Russian Federation of 20.06.2022 No. 18

- difficulties in sending a team of medical specialists to the patient [4, 5].

Significant difficulties in the organization and conduct of medical evacuation of patients both by specialized aircraft and passenger flights of Russian air carriers, take place when it is carried out from the territory of European and other states due to sanctions imposed by European Union countries.

The use of foreign airlines for air ambulance evacuations is problematic due to the complexity of coordinating a medical flight, installing a stretcher for a bedridden patient and transporting medical equipment, as well as due to visa restrictions. Difficulties also arise in ordering airline tickets, since foreign airlines in some cases refuse individuals with Russian passports, preferring to work only through international assistants.

Under such conditions, the organization of medical evacuation involves the use of ambulances or combined transportation — air and automobile transport.

Thus, medical evacuation of a patient from Barcelona (Spain) to Moscow would be advisable by local foreign air ambulance to Riga (Latvia) or Helsinki (Finland) and then by ambulance to the destination.

From the territory of the Republic of Cyprus, medical evacuation of a patient to Moscow can be arranged via Turkey, Egypt, the United Arab Emirates, as well as via European countries using local air ambulance to airports, where air travel or transportation by Russian forces is possible.

With visa restrictions in place at the stage of local air ambulance, medical evacuations can only be performed by foreign medical workers.

In the case of cross-border medical evacuation of a patient in an ambulance vehicle difficulties may arise when passing through customs control points. Customs officers inspect separately the ambulance and the medical equipment included in it, demanding additional documentation for medical devices. To date, the procedure for interaction with the Federal Customs Service of Russia on the issues of passing medical equipment and medical personnel when organizing medical evacuations has not been developed.

Until recently, cross-border medical evacuation carried out by ambulance vehicles was practically forbidden due to measures to prevent the spread of the new coronavirus infection Covid-19 and the ban on crossing the borders of the Russian Federation through land border in accordance with the Decree of the Government of the Russian Federation of March 27, 2020 № 763-r.

During the Covid-19 pandemic, the regulations governing the rules for the passage of citizens of various categories across the state border did not prescribe a procedure for the departure of medical personnel to provide medical support to patients evacuated from abroad and abroad.

Currently, there is no mechanism of interaction with the Border Guard Service of the Federal Security Service of Russia in terms of ensuring unhindered passage by medical personnel through border control points when departing to a foreign country to pick up a pa-

tient. This problem was acute in conditions of partial mobilization, declared by the Decree of the President of the Russian Federation from September 21, 2022 №647<sup>7</sup> — at the stage of organization of medical evacuation from abroad there was no possibility to specify information about absence of restrictions for departure of the medical worker abroad.

### Discussion and Conclusions

The expediency of medical evacuation by ambulance against the background of the introduced changes and restrictions is determined by a set of factors, among which the main ones are:

- lack of opportunity to provide medical care in the necessary volume in the medical organization at the place of the patient's stay;
- transportability of the patient in accordance with the conditions and duration of transportation.

If the patient's condition does not allow for transportation over significant distances, it is necessary to address the issue of organizing and conducting specialized treatment in medical institutions in the region of residence and nearby areas, or to involve specialized doctors to perform operations "on site".

For example, children with cardiac surgery pathology from the southern regions of Russia should be routed instead of the National Medical Research Center named after V.A. Almazov of the Ministry of Health of Russia (St. Petersburg) to specialized institutions in Krasnodar [6].

In the case of international medical evacuations, against the background of a significant increase in the cost of airfare, it is sometimes economically feasible to leave the patient in a foreign clinic to undergo the necessary treatment until the recovery period and the possibility of independent repatriation becomes possible. Insurance companies increasingly prefer to spend insurance coverage on specialized treatment at the place of illness instead of arranging medical transportation to home country.

Thus, before restrictions were introduced, the cost of medical evacuation of a patient by individual air ambulance from the territory of the Republic of Cyprus to Moscow was 20,000.00 EUR, after restrictive measures were adopted it is 65,000.00 EUR, i.e. the cost of air travel increased by 45,000.00 EUR.

Thus, the main problematic issues of medical evacuation of patients and victims under the current restrictive flight regime are:

- lack of normative regulation of organization and conduct of medical evacuation of civilian population under the imposed restrictions;
- lack of capacity to operate aircraft for medical evacuation of patients via direct routes;
- increased duration of medical evacuations in the case of ground transportation and associated risk of clinical complications for patients during evacuations;

<sup>7</sup> On Declaring Partial Mobilization in the Russian Federation: Presidential Decree No. 647 of September 21, 2022

- risk of technical malfunction of ambulances used for medical evacuations due to the long distances involved (1,500-2,000 km);
- staging and combined options for medical evacuations with the need for additional transfer of the patient and waiting at airports of departure;
- lack of mechanisms for organizing medical evacuation of patients from the territory of the European Union and other unfriendly countries.

Possible ways to optimize the system of medical evacuation of patients during flight restrictions:

- inter-agency cooperation in terms of the possibility of involving departmental aircraft that have permission to fly to restricted airports in order to carry out as-

- sociated medical flights for seriously ill civilians;
- working out routing and resolving the issue of organizing necessary volume of specialized, including high-tech, medical care in the territories with closed airports in nearby federal centers;
- development of mechanisms for the prompt referral of specialized doctors to the location of patients to provide them with specialized medical care;
- further development of emergency consultative medical care, including the use of telemedicine technologies;
- working out questions about the assistance of Russian consular institutions in organizing the medical evacuation of patients from abroad.

#### СПИСОК ИСТОЧНИКОВ

1. Временные методические рекомендации «Профилактика, диагностика и лечение новой коронавирусной инфекции (COVID-19)». Версия 15 (22.02.2022). Министерство здравоохранения Российской Федерации [Электронный ресурс]. URL: [https://static-0.minzdrav.gov.ru/system/attachments/attaches/000/059/392/original/%D0%92%D0%9C%D0%A0\\_COVID-19\\_V15.pdf](https://static-0.minzdrav.gov.ru/system/attachments/attaches/000/059/392/original/%D0%92%D0%9C%D0%A0_COVID-19_V15.pdf).
2. Официальный сайт информационно-правового портала. [Электронный ресурс]. Режим доступа <https://www.garant.ru/>.
3. Баранова Н.Н., Акиншин А.В., Гончаров С.Ф., Мешков М.А., Зеленцов К.М., Письменный В.П. Медицинская эвакуация больных COVID-19 // Медицина экстремальных ситуаций. 2020. Т. 22. №3. С. 83-89.
4. Баранова Н.Н. Медицинская эвакуация пострадавших: состояние, проблемы. Сообщение 2 // Медицина катастроф. 2019. №1. С. 42-46.
5. Баранова Н.Н. Медицинская эвакуация пострадавших: состояние, проблемы. Сообщение 3 // Медицина катастроф. 2019. №2. С. 38-44.
6. Мальцева О.С., Шелухин Д.А., Пшениснов К.В., Александрович Ю.С., Редкокаша А.А., Прозорова М.Н. Модель и принципы организации скорой специализированной медицинской помощи детям на этапе медицинской эвакуации // Медико-биологические и социально-психологические проблемы безопасности в чрезвычайных ситуациях. 2021 № 2. С. 52-61.

#### REFERENCES

1. URL: [https://static-0.minzdrav.gov.ru/system/attachments/attaches/000/059/392/original/%D0%92%D0%9C%D0%A0\\_COVID-19\\_V15.pdf](https://static-0.minzdrav.gov.ru/system/attachments/attaches/000/059/392/original/%D0%92%D0%9C%D0%A0_COVID-19_V15.pdf) (In Russ.).
2. URL: <https://www.garant.ru/> (In Russ.).
3. Baranova N.N., Akin'shin A.V., Goncharov S.F., Meshkov M.A., Zelen'tsov K.M., Pys'mennyy V.P. Medical evacuation of patients COVID-19. *Meditsina Ekstremal'nykh Situatsiy = Extreme Medicine*. 2020;3:83-89 (In Russ.).
4. Baranova N.N. Medical Evacuation of Victims: Their State, Problems. Report 2. *Meditsina Katastrof = Disaster medicine* 2019; 1:42-36 (In Russ.).
5. Baranova N.N. Medical Evacuation of Victims: Their State, Problems. Report 3. *Meditsina Katastrof = Disaster medicine*. 2019;2:38-44 (In Russ.).
6. Mal'tseva O.S., Shelukhin D.A., Pshenisnov K.V., Aleksandrovich Yu.S., Redkokasha A.A., Prozorova M.N. Model and Principles of Organizing Emergency Specialized Medical Care for Children at the Stage of Medical Evacuation. *Mediko-Biologicheskie i Social'no-Psikhologicheskiye Problemy Bezopasnosti v Chrezvychaynykh Situatsiyakh = Medico-Biological and Socio-Psychological Problems of Safety in Emergency Situations*. 2021;2:52-61 (In Russ.).

Материал поступил в редакцию 20.10.22; статья принята после рецензирования 16.12.22; статья принята к публикации 23.12.22  
The material was received 20.10.22; the article after peer review procedure 16.12.22; the Editorial Board accepted the article for publication 23.12.22