

## **The first social project to popularize organ donation in Tatarstan based on the experience of the United States of America**

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### **Abstract**

**Relevance.** *The United States of America is currently one of the world leaders in organ donation and transplantation. In 2020, donor activity in the United States amounted to 38.0 per 1 million of the population, even exceeding the number in Spain 37.9 per 1 million of the population. In this context, the study of the American system of organ donation and transplantation in order to develop an accessible format for interaction with the population to strategically stimulate the potential of organ donation is of particular interest.*

**Aim.** *To study the organ donation and transplantation system in Nebraska, United States of America, to develop an accessible format for interaction with the population to strategically stimulate the potential of organ donation in the Republic of Tatarstan.*

**Material and methods.** We presented the experience of the international internship «Organ donation and transplant management» at the University of Nebraska Medical Center (USA). We described the peculiarities of the functioning of the American transplant programs, the advantages in the matter of organizing organ and tissue donation.

**Results.** In the USA, with a population of 327 million people, today more than 165 million (51%) people are registered as potential donors. At the end of 2018, in the United States 36,428 transplants of various organs and tissues, or 111.4 per 1 million population, were performed. At the same time, the number of deceased donors was 10,700, the number of living donors – 6,800. At the University of Nebraska Medical Center during the same period, 301 transplants (158.4 per million population) were performed from 68 deceased and 40 living donors. The analysis of the American system of organ donation and transplantation with effective interaction of the state, commercial and non-profit sectors, independent of the National Health System, made it possible to organize in 2020 the first social project in the Republic of Tatarstan on organ donation – «Donate Life Russia».

**Conclusion.** The experience of the Republic of Tatarstan in attracting the non-profit sector to solving problems in the development of the transplant programs, following the example of the United States of America, has high potential in the Russian Federation.

**Keywords:** organ donation, organ transplantation, international internship, American model

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## **Introduction**

In the Republic of Tatarstan, with a population of 3.9 million people, about 206 patients need kidney transplant, 76 patients need liver and 40 patients need heart transplants annually. At the same time, despite the positive dynamics of growth in the number of organ transplantations, the need for donor organs significantly exceeds the volume of transplantation care rendered. In 2018, 32 organ transplants were performed in Tatarstan, or 8.2 per 1 million population. In 2019, there were 57 organ transplants, or 14.6 per 1 million people. In 2020, 64 organ transplants were performed or 16.4 per 1 million population. For comparison, in the Russian Federation with a population of 146.8 million people, a total of 1,960 organ transplants were performed in 2020, or 13.4 per 1 million population. The level of donor activity per population made 5.7 per 1 million population in 2018, 6.2 in 2019, 6.9 per 1 million population in 2020. In the Russian Federation, it made 3.9 per 1 million population in 2020. In 2018, 27 kidney transplants were performed (6.9 per 1 million), 39 (10.0 per 1 million) in 2019, 40 (10.3 per 1 million) in 2020. In the Russian Federation, there were 1,124 (7.7 per 1 million population) kidney transplants performed in 2020. In 2018, 4 liver transplants were performed (1.0 per 1 million), 14 (3.6 per 1 million) in 2019, 20 (5.1 per 1 million) in 2020. In the Russian Federation, 559 (3.8 per 1 million population) liver transplants were performed in 2020. There was 1 heart transplant (0.3 per 1 million) performed in the Republic of Tatarstan in 2018, 4 (1.0 per 1 million) in 2019, 4 (1.0 per 1 million) in 2020. In the Russian Federation, there were 251 (1.7 per 1 million population) heart transplants performed in 2020 [1]. Thus, the results of

the recent three years have shown a positive trend in the number of organ transplants in the Republic of Tatarstan, even despite the severe epidemiological situation in 2020 associated with the spread of the new coronavirus infection COVID-19. However, the need for organ transplants still exceeds the number of operations performed, and the number of patients on waiting lists for organ transplantation is increasing annually due to a shortage of donor organs. Meanwhile, low levels of awareness about the principles of functioning of the organ transplantation service, the absence of organized education activities, and the reproduction of negative images of transplantologists by the mass media lead to the fact that the potential donor reserves are used very inefficiently [2, 3]. Despite the fact that the country proclaimed the "presumed consent" concept, 78% of the population are not willing to become a donor after death [4].

On the other hand, the United States of America, with its *Expressed Consent/Opt-In Organ Donation Policy*, is one of the leaders in organ donation and transplantation. Today, more than 165 million (51%) U.S. citizens are registered as donors. In 2020, the donor activity per population in the United States was 38.0 per 1 million people, exceeding even Spain's figure of 37.9 per 1 million people [5-7]. At the same time, pancreatic, lung, and intestinal transplants are performed routinely and everywhere. More and more reports of successful face, arm, and abdominal wall transplants have appeared in literature [8-10]. In this aspect, on the basis of academic interaction, the study of the American healthcare experience in the development of organ donation and transplantation under the legally established "expressed consent" is of particular interest. That is why **the purpose** of this report was to describe the current state of affairs in organizing the organ donation and transplantation system in the state of Nebraska in the United States of

America in order to develop an accessible format for interaction with the population to strategically stimulate the organ donation potential in the Republic of Tatarstan.

### **Material and methods**

In 2019, as part of an academic cooperation, one of the authors of this report won the "Algarysh" Grant of the Republic of Tatarstan Government, and for the period from July 15 to September 15, 2019, he completed an international internship on the program of "*Organ donation and transplant management*" at the University of Nebraska Medical Center (USA) [11]. During the internship, the state and trends of organ donation and transplantation in Nebraska (USA) were monitored, statistical data were analyzed, and the experience of organizing the public education on the problem of organ donation was studied.

### **Results**

The internship was held in Omaha, Nebraska (USA). The population of the city is 600 thousand people, the state population is 1.9 million people. The city is home to one of the oldest (founded in 1869) and largest (30 thousand students) universities in the United States. The University's clinical base is the University of Nebraska Medical Center, which is one of the top-100 best hospitals in the United States, and renders emergency care in 718 emergency round-the-clock beds for all major nosologies (Fig. 1).



**Fig. 1. Campus of the University of Nebraska Medical Center**

The Center of Transplantation at the University of Nebraska Medical Center transplants kidneys, liver, heart, pancreas, lungs, and intestines. The Center of Transplantation is headed by Professor of Surgery Alan Langnas, DO, FACS [12].

At the time of the internship, by the end of 2018, 36,428 organ and tissue transplants had been performed in the United States as a whole with a population of 327 million people, or 111.4 per 1 million population. The number of postmortem donors was 10,700, while the number of living donors was 6,800. Nebraska Medical Center performed 301 transplants (158.4 per 1 million population) from 68 postmortem and 40 live donors during the same period. The nature and number of organ transplants in the United States as a whole and in the state of Nebraska in 2018 are presented in Table 1.

**Table 1. Nature and total number of organ transplants in the USA and in the State of Nebraska in 2018**

No.	Transplanted organ	USA (327 million people)	Per 1 million population	State of Nebraska (1.9 million)	Per 1 million population
1	Kidney	21167	64.7	137	72.1
2	Liver	8250	25.2	83	43.7
3	Heart	3408	10.4	47	24.7
4	Lung	2530	7.7	11	5.8
5	Pancreas	192	0.6	8	4.2
6	Kidney + Pancreas	835	2.6	4	2.1
7	Heart + Lung	32	0.1	0	0
8	Intestine	104	0.3	11	5.8
9	Uterus	7	0.02	0	0
10	Facial skull	1	0.003	0	0
11	Abdominal wall	1	0.003	0	0
12	Penis	1	0.003	0	0
Total		36428	111.4	301	158.4

In the United States, organ donation is organized by "*Donate Life America*", a non-profit organization that is independent from the National Health System. In Nebraska, its affiliate is the non-profit organization *Live on Nebraska*, which fully supports the organ donation process in the State (Fig. 2).





**Fig. 2. Office of the non-profit organization "Live on Nebraska". The Forensic Unit and Sterile Operating Rooms occupy the basement (-1) floor**

At the same time, the surgical service itself is in no way connected with the organization of organ donation. Doctors of the Medical Center are forbidden to talk to relatives on this topic, because this may be considered as a compulsion to organ harvesting. The Medical Center is required to inform the *"Live on Nebraska"* organization about each potential donor. The task of *"Live on Nebraska"* employees who are on duty in the hospital around the clock is to assess the condition of a potential donor, identify him/her in the system, and send for organ removal. If it turns out that the patient was not registered as a donor during his/her lifetime, the organization begins active psychological work with close relatives of the deceased in order to use his/her donor potential. The dialogue with relatives is conducted by professional transplant coordinators and staff psychologists who work being as tactful as possible, following ethical principles. Donation is presented as a noble gift and a chance to save people whose loved ones may soon also feel the pain of loss. This approach is more compassionate and subconsciously urges relatives to make the right decision, rather than forcibly persuade



them to it. It is not uncommon to expect a positive decision from relatives of the deceased for several days. At the same time, the conditioning of a potential donor continues; the donor potential outweighs the financial costs of several bed-days in a hospital.

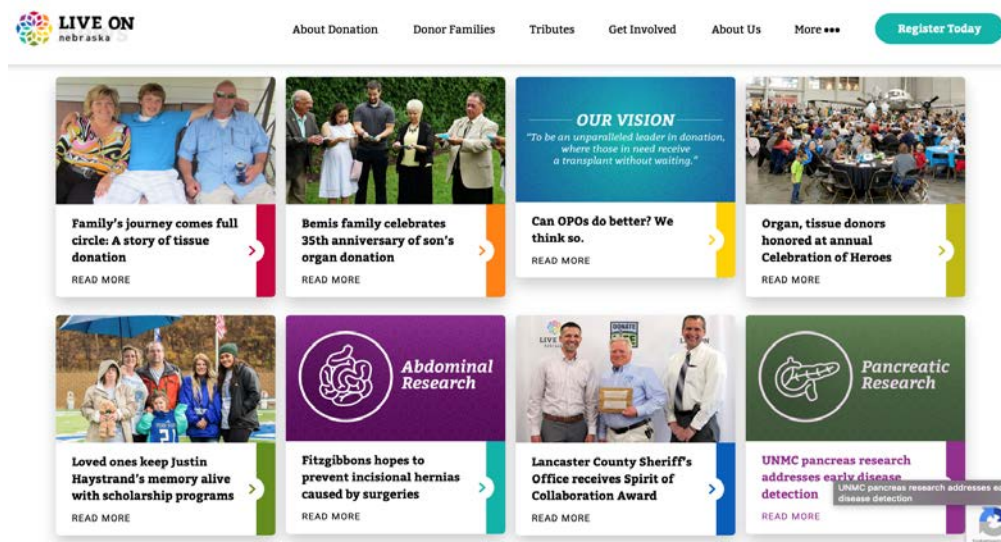
A special attention is paid to the heroism, nobility, and solemnity of the organ donation institution. On the day of organ harvesting, a special flag is raised over the Medical Center in honor of the donor who has saved several other patients. Moreover, "Honor walk" represents a widespread ritual, when the family, relatives, and hospital employees line up in a farewell corridor, through which the donor's body is taken to the operating room for organ harvesting. Thus, organ donation in the United States is an opportunity to have a personal tragedy coincided with something noble and hopeful: loss with gain, death with life, sacrifice with heroism.

After solid organ explantation, the donor's body is transported from the hospital to the local forensic medical examination office. There is a special block with sterile operating rooms for harvesting biological tissues of the donor. Flaps of skin from the back and thighs are removed from the donor, as well as cartilage; tubular bones; major vessels; corneas, and heart valves, if the latter have not been explanted. Interestingly, this procedure is performed by people without specialized medical education. In Nebraska, in particular, they are biologists, veterinarians, or anatomists. Then the remains of the body are sent to the funeral home, where they are prepared for burial.

This is not the end of the "Live on Nebraska" organization's tasks. After the patient is discharged from the hospital with a transplanted organ, the "Live on Nebraska" organization takes control of both the patient and the family of the hero donor. The former one is assisted with medical rehabilitation and return to a full life. The latter ones are given a

psychological assistance and helped to get gradually adapted to their life without a loved one. If the parties express a desire to get to know each other, "Live on Nebraska" ensures that they meet and interact in accordance with a strict protocol and under the supervision of staff psychologists. Parties are organized for people who have experienced the grief of loss. Here they can share the pain of loss and at the same time pride in a noble act with their families, so that together they can develop humanistic ideas of donation in society.

In general, promoting organ donation is one of the key activities of the "Live on Nebraska" organization (Fig. 3).



**Fig. 3. The home website page of the non-profit organization "Live on Nebraska", which presents examples of social events popularizing organ donation (honoring hero-donors and their families; support for families after donation; general holidays and meetings for donor and recipient families, etc.)**

To this end, Nebraska regularly hosts social events: schools, lecture halls, marathons, charity concerts, and festivals dedicated to this topic. [13]. Given a considerable piety of the American population, "Live on Nebraska" specialists ensure extensive interactions with all major

religious confessions. The latter, in turn, actively encourage organ donation.

The State actively supports transplantation at the legislative level. So, in 2019, US President Donald Trump signed an Executive Order that gives lifetime donors a number of benefits and simplifies the process of organ harvesting from post-mortem donors. According to forecasts, this will significantly increase the number of transplanted organs, approximately by 11-17 thousand annually [14]. According to our American colleagues, such a well-thought-out integrated approach made it possible to overcome the traditional stereotypes about crime and the "black market" in the field of transplantation, which were widespread in the United States about 20 years ago. As a result, more than 165 million people (51%) of the 327 million US population of now voluntarily registered as potential donors (Fig. 4).



**Fig. 4. The mark in the driver's license on the consent to become a donor**

## Discussion

At the turn of the XXI century, in conditions of unprecedented growth of scientific and technological progress, organ transplantation, accumulating the latest achievements of surgery, resuscitation,

immunology, pharmacology, and other medical and biological sciences, firmly entered the arsenal of many medical organizations, opening a new era in the development of modern medicine. The level of transplantation development reflects the level of the medicine development in a country or region and is an important national indicator of their economic well-being. The American system of organ donation and transplantation is a good example of an effective interaction between the government, commercial and non-profit sectors. Taking into account the experience of the United States, it is advisable in Russia to develop an accessible, interdisciplinary format of interaction with the population in order to involve them in the discussion of the problem and strategically stimulate the donor potential [15]. Based on the above, as well as taking into account the experience gained during an international internship, the authors were supported by the Kazan (Volga Region) Federal University and the Kazan State Medical University of the RF Ministry of Health; and in 2020, the Center for the Development of Organ Donation "Donate Life Russia" was organized on the basis of the "Clinic of Medical Law", an Autonomous Non-Profit Organization (Fig. 5).



**Fig. 5. The Emblem of the Center for the Development of Organ Donation "Donate Life Russia"**

This is the first social Project in the Republic of Tatarstan to promote organ donation. The Project raises awareness of the Republic's population through accessible information content. Lectures and discussions are attended by specialists in the field of healthcare organization, transplantology, charity, volunteerism, as well as lawyers and opinion leaders. In 2020, the Project received the grant support from the Federal Agency for Youth Affairs (Rosmolodezh) [16]. The Tatarstan regional branch of the All-Russian public organization "Russian Red Cross" is also an active partner of the project.

In our opinion, the lack of increased involvement of people with medical education in the problem of organ donation is ambiguous. Despite the dominant positive attitude to the problem, unfortunately, myths about the criminal nature of organ donation are widespread among "doctors", as well as among "non-doctors". In this regard, we fully support the opinion of our colleagues on the need to modernize the medical education system with the mandatory inclusion of disciplines on transplantation and organ donation in the educational curricula of medical universities [17]. This, on the one hand, will update the level of professional competence of graduates, and, on the other hand, will give an impetus to the development of transplantology both in megacities, and also in the regions of the Russian Federation. In connection with the above, in the 2021-2022 academic year, at the Department of Emergency Medicine and Simulation Medicine of the Institute of Fundamental Medicine and Biology of Kazan (Volga Region) Federal University, an optional course of "Clinical Transplantology" was introduced into the educational curricula of all medical specialties; and a student scientific and practical circle of transplantology, organ donation, and experimental surgery was organized.

## Conclusion

Comprehensive interdisciplinary work to promote organ donation has allowed the United States to overtake countries with the accepted "presumed consent" concept and become a leader in the field of transplantation. The presented experience of a well-thought-out integrated approach to the organization of the organ donation and transplantation system in the state of Nebraska (USA) strongly demonstrates the need to develop and widely implement an accessible, interdisciplinary format of interaction with the population for strategic stimulation of donor potential. The experience of the Republic of Tatarstan in involving the non-profit sector in addressing the challenges of developing a transplantation program, following the example of the United States of America, has good potential in the Russian Federation.

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