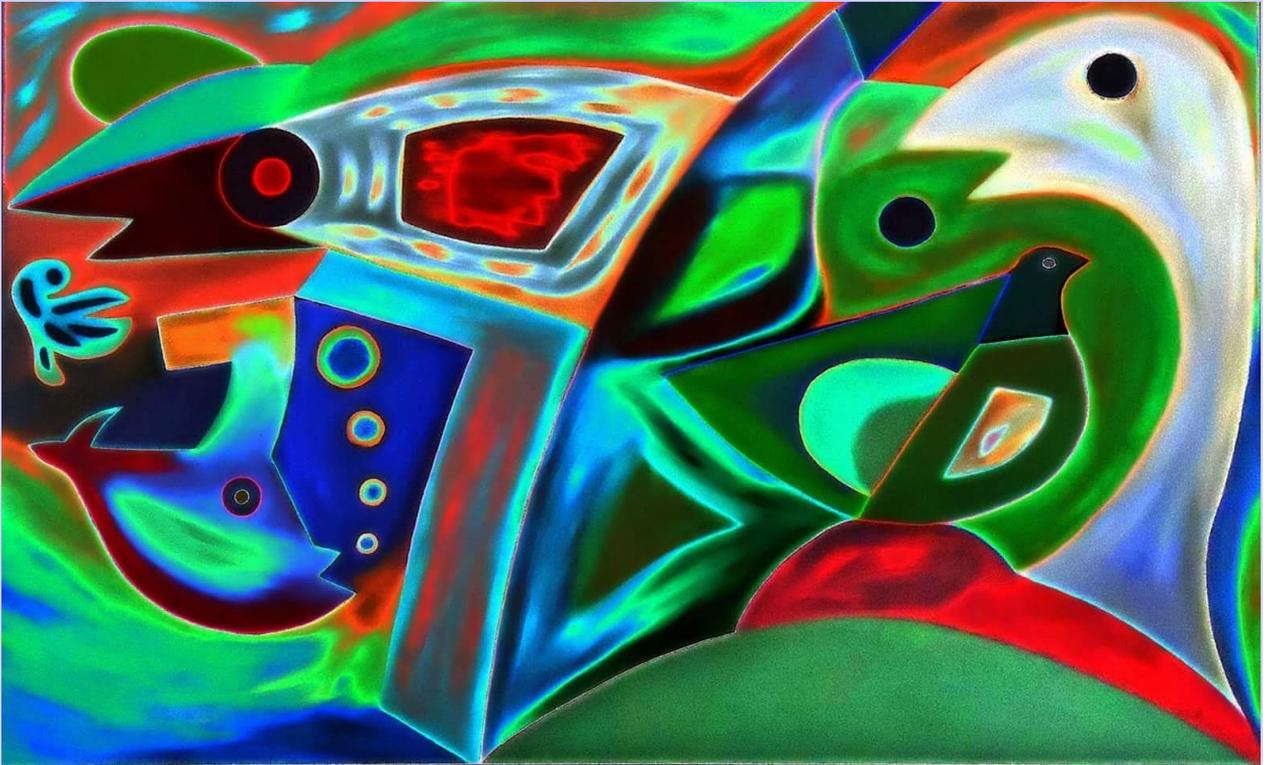


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Accessibility to Join Bone Marrow Donor Registry for Volunteers

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Abstract. Recruitment of potential bone marrow donors is information and engagement (registration) of volunteers in the register of potential bone marrow donors. The entry of a potential donor into the registry is the organization of obtaining informed consent, collecting biological samples and delivering them to the laboratory. Accessibility to join the bone marrow donor registry for volunteers depends from way of collection biologic samples. There are four ways: Blood Service, commercial laboratories, post and at the event. We have developed a scale for assessing the criteria for the accessibility of entry into the register depending on the entry method. The high accessibility of entry into the register can be ensured by interaction with the Russian Post and a network of commercial laboratories that scored the highest score of 10 out of 12 during the accessibility assessment. It is possible to use the full potential of 54 million residents of the Russian Federation aged 18-45 years to form a register of bone marrow donors regardless of the territorial basis only through the interaction of large public and private structures.

Keywords: Registry, bone marrow donors, recruiting, volunteers.

1. INTRODUCTION

The restriction of HLA-identical pairs of brothers and sisters in the family became a major problem while performing allogeneic hematopoietic stem cell transplantation (Allo-HSCT) in the 1970s. Only a quarter of all patients in need had a suitable donor in the family. In 1974, Shirley Nolan, the mother of a child with Wiskott-Aldrich Syndrome - Anthony Nolan, established the Anthony Nolan Foundation and generated the first database of potential bone marrow donors in order to find HLA (Human Leukocyte Antigens) identical unrelated donor to her son. Nowadays, the Foundation's database has become a bone marrow donor registry and has more than 800,000 potential donors.

Hansen and colleagues performed the first successful unrelated donor (URD) bone-marrow transplantation to a patient with leukemia in 1979. A growing number of patients receive allogeneic HSCT after the formation of unrelated registries in many countries and their consolidation under the auspices of the World Marrow Donor Association (WMDA) [1].

WMDA was established in 1994 and unites country registers into a Search & Match Service Unified Information System. The search engine contains more than 39 million anonymized HLA phenotypes of potential donors from 55 different countries.

The first database of bone marrow donors in Russia was established based on the Republican Center for Immunological Tissue Typing of the Russian Research Institute of Hematology and Transfusiology in accordance with Order No. 228 of the Ministry of Health of the Russian Soviet Federative Socialist Republic dated July 5, 1988 [2]. Personnel donors of the Blood Service were engaged, the primary immunological examination of which was fulfilled in the zonal laboratories of

immunological typing [3]. The services of immunological tissue typing and the Republican Center for Immunological Tissue Typing were formed in 1979 with the purpose of providing immunological support for bone marrow and organ transplantations in accordance with Order No. 658 "On the establishment of the Republican Center and zonal laboratories for immunological tissue typing" dated December 27, 1978. The service included the Republican Center for Immunological Tissue Typing based on the Leningrad Institute of Blood Transfusion and eight zonal laboratories located at blood transfusion stations in such cities as Nizhny Novgorod, Samara, Ivanovo, Novosibirsk, Rostov-on-Don, Yekaterinburg, Chelyabinsk, and Khabarovsk [4].

A register of potential donors of hematopoietic stem cells (HSCs) was organized based on the federal network of plasma centers of the Russian Medical Research and Production Center "Rosplasma" of the Federal Medical and Biological Agency (FMBA) of Russia, Kirov, in 2009. Recruitment of potential HSC donors was fulfilled in two main ways: working with regular plasma donors and holding mass actions in educational organizations, institutions and large enterprises [5].

The Vasya Perevoshchikov "National Bone Marrow Donor Registry" Charity Fund began its activities in 2017. Potential donors are engaged to the register through the campaigns held in various regions of the Russian Federation (RF); engaging blood donors in blood service institutions [6]. Besides, citizens of the Russian Federation join the register on their own with the aid of medical offices of partner laboratories. The National Bone Marrow Donor Registry combines data from 2 donor centers using the Bone Marrow Donor Data (BMDD) HLA phenotype information storage system. This is our own donor center and Karelian Registry of unrelated Hematopoietic Stem Cell Donors.

2. DATA AND METHODOLOGY

Open data from the website of the FMBA of Russia was used for the research. Decree 640, according to which the FMBA of Russia generated and maintained the program of the "Federal Register of bone marrow and hematopoietic stem cell donors, donor bone marrow and hematopoietic stem cells, bone marrow and hematopoietic stem cell recipients", came into effect on September 1.

Recruitment of potential bone marrow donors is information and engagement (registration) of volunteers in the register of potential bone marrow donors. The entry of a potential donor into the registry is the organization of obtaining informed consent, collecting biological samples and delivering them to the laboratory.

Recruiting is divided into two fundamentally various sources of volunteers: blood donors and free recruiting (outside blood transfusion stations). The first source is the blood transfusion stations based on which the entry of a potential donor is performed. Blood donors are traditionally considered as the best source of healthy volunteers, since they are checked for blood-borne infections and receive a statement from a transfusiologist doctor for blood donation.

The second source is a free recruiting among groups, communities, and at public events. Determination of the health level occurs according to the questionnaire of the volunteer. The questionnaire was developed and is based on the contraindications to blood donation in accordance with the Federal Law N 125-FZ "Concerning the Donorship of Blood and Components" [7] as of July 20, 2012. Besides, a volunteer can indicate a disease that is not included in the questionnaire, and then a medical worker of the registry will get in contact with him/her and allow or not allow a potential bone marrow donation.

Biological samples for typing can be of two types: blood and buccal epithelium. Blood sampling requires an equipped and licensed procedure room (Fig.1.), as well as a medical professional. The blood is transported under special conditions in

compliance with the cold chain +6-+8 degrees, and if the samples are frozen, then the transportation should occur at negative temperatures.



Fig.1. Treatment room for blood collection.

The volunteer takes the buccal epithelium on his/her own using the instructions for the kit. No special transport conditions are required. (Fig.2.)



Fig.2. Buccal epithelium collection.

The transportation of samples is an integral part of the work when a volunteer is registered in the register. HLA typing is a molecular biological technique that requires a PCR laboratory, trained personnel, and expensive equipment. Stream typing of volunteers is possible with the availability of NGS technology and large volumes of laboratory workload. Five laboratories use this technique in order to replenish the register as of today.

When submitting a sample for typing to the registry, a volunteer signs an informed consent to the processing and storage of personal data, collecting a blood sample with the aim of determining the HLA phenotype and agrees to consider the possibility of donating hematopoietic stem cells if the HLA phenotype matches the potential recipient [6].

When recruiting is based on the register of blood donors, the number of stationary places for joining the register is limited by the regional and federal network of Blood Services. The regional Blood Service network includes 84 blood transfusion stations, 138 branches of blood transfusion stations, 167 blood transfusion departments. The federal network consists of 4 blood transfusion stations, 15 plasma centers of the FMBA of Russia and 50 blood transfusion departments of the federal institutions of the FMBA of Russia, the Ministry of Health of the Russian Federation and others. Altogether, there are 458 points of registration of volunteers in the register. Donor reception time is usually limited to the morning hours from 8:00 a.m. to 01:00 p.m. and patients are received on work days. Blood is used as a biological sample for HLA typing. The Blood Service does not have a unified logistical system for collecting biological samples, which is necessary for sending HLA typing to the laboratory, processing and storing personal data. In this regard, it is necessary to organize transportation from each blood transfusion stations. Thus, blood samples and personal data of volunteers are collected, frozen, and are taken to the laboratory as they accumulate in order to reduce logistics costs; the time for entering the register can increase up to 6 months. In total, 1.3 million donors of blood and its components visited the blood supply service in 2021 according to the data from the FMBA XIV All-Russian Forum of Blood Services 2022.

To fulfill a free recruiting, it is necessary that volunteers be allowed to enter the register, which is ensured in several ways: collecting a biological sample from a volunteer directly during the recruiting event; self-entry of a volunteer with the aid of partner medical offices; self-entry of a volunteer using an online application for an individual collection of a biological sample by mail. Recruiting is possible among 54,524 million inhabitants of the Russian Federation, whose age is from 18 to 45 years according to the Federal and Global State Statistics Service [8-15].

Sample collection is done by a recruiter at the event using buccal epithelium collection kits. The kit allows a volunteer to independently collect the material within 3 minutes and give it to the recruiter. There is a restriction on food intake prior to collection of a biological sample, which may prevent a volunteer from submitting a sample directly at a recruiting event. The average number of participants at the event usually does not exceed 20% according to the National register of bone marrow donors.

The method of entry into the registry through a network of commercial laboratories is widely used by the National register of bone marrow donors. Nowadays, three networks are participating in the entry of volunteers: INVITRO, CMD, and DNKOM. The network of commercial laboratories includes more than 2,000 biomaterial receiving offices and is expanding every month. Volunteer reception times are usually from 7:00 a.m. to 07:00 p.m., 7 days a week. Blood is collected as a biological sample for HLA typing. The network of offices is connected to central laboratories, the number of which is limited to a few. In this regard, all laboratories are connected to the main laboratory plant in Moscow, which makes it possible to collect samples at one point. A large number of offices enable the National register of

bone marrow donors to collect 200-300 blood samples weekly at the central laboratory plant, where from samples are sent to the HLA laboratory on a weekly basis.

Volunteer self-entry is fulfilled through an online application for an individual biological sample collection by mail. The Russian Post has 42 thousand branches, the opening hours of which are from 8:00 a.m. till 08:00 p.m., Saturday is a shortened day, and Sunday is a day off. Thus, the volunteers can receive and send a kit 6 days a week. Each entry kit is sent individually to the volunteer and then to the HLA laboratory.

We have developed a scale for assessing the criteria for the accessibility of entry into the register depending on the entry method. The assessment scale consisted of + satisfactory, ++ average, +++ good. Each + is one point (Table 1).

Table 1. Smartphones digital cameras' parameters

	Blood Service	Commercial laboratories	By the post	At the event
Quantity of points	458 +	Over 2,000 ++	42 thousand +++	184 ++
Opening hours	Till 01:00 p.m. +	Till 07:00 p.m. ++	Till 08:00 p.m. +++	- ++
Transportation to the register	Group from each blood transfusion station ++	Centralized from Moscow +++	Individual +	Group from each campaign ++
Volunteer audience	1.3 million +	54 million +++	54 million +++	60 thousand +
TOTAL	5	10	10	7

3. RESULTS

According to the submitted data, the Russian Post has the largest number of points with a long time for receiving volunteers, thereby ensuring high accessibility of entry into the register. In this regard, the logistics of samples is one of the longest, because it is individual from the date of requesting a set of samples. Thus, having scored 10 points out of 12.

The network of commercial laboratories has a fairly large number of offices and a centralized logistics system, which allows volunteers to enter the register in the fastest way. While assessing an accessibility 10 out of 12, recruiting at an event is more of an informational nature than an effective method of registration in the register. Therefore, the accessibility was 7 points out of 12 points.

The Blood Service has a small number of points for entry into the register, insufficiently convenient working hours and a small audience in comparison with other study participants. The Blood Service scored 5 points out of 12 points according to the accessibility scale.

5. CONCLUSION

Attracting volunteers to the register of bone marrow donors in the modern world requires new progressive solutions. Registration in the register should be convenient and fast, which is poorly implemented by the classical method of taking biological samples through blood on the basis of state institutions. Nevertheless, it is blood donors who are the healthiest volunteers. The question of whether blood donors are the most informed about this problem remains open.

The high accessibility of entry into the register can be ensured by interaction with the Russian Post and a network of commercial laboratories that scored the

highest score of 10 out of 12 during the accessibility assessment. The Russian Federation consists of 85 districts and has a large territory, where more than 200 nationalities live. One of the objectives in the formation of the bone marrow donor registry is to ensure genetic diversity to increase the likelihood of matching a donor-recipient pair. It is possible to use the full potential of 54 million residents of the Russian Federation aged 18-45 years to form a register of bone marrow donors regardless of the territorial basis only through the interaction of large public and private structures.

In the future, it is necessary to compare the two most accessible methods of joining the register in order to determine the leading path for volunteers. And additionally investigate the experience of blood donation in these volunteers. This will help to improve the quality of recruited donors [16-18].

REFERENCES

1. Mateja Kralj Juric, Sakhila Ghimire, 2Milestones of Hematopoietic Stem Cell Transplantation – From First Human Studies to Current Developments. *Front Immunol.*, 7, 470 (2016).
2. Bubnova L. N., Pavlova I. E., Glazanova T. V. and co-authors. Hematopoietic stem cell donor registries. *Medline. Russian biomedical journal.*, 16(3), 751–758 (2015) (In Russ.).
3. Bubnova L. N., Chechetkin A. V., Immunogenetic researches at the Russian Research Institute of Hematology and Transfusiology. *Bulletin of hematology.*, XI (2), 8-9 (2015).
4. Immunological typing service and the registry of hematopoietic stem cell donors in Russia / E. A. Selivanov, Bubnova L. N. // *Bulletin of hematology.*, 3,:42–44 (2009).
5. Loginova M. A., Paramonov I. V. Work experience of the register of potential donors of hematopoietic stem cells. *Issues of hematology/oncology and immunopathology in pediatrics.* 13 (1), 9–12 (2014).
6. Makarenko O. A., Kuzmich E. V. Potential bone marrow donor: definition, criteria for registration in the register of unrelated bone marrow donors. *Health care of the Russian Federation.* 63 (4), 221-224 (2019) (In Rus.).
7. Order of the Ministry of Health of the Russian Federation dated September 14, 2001 No. 364 "On Approval of the Procedure for Medical Check of a Blood Donor and Its Components". Access mode: http://www.consultant.ru/document/cons_doc_LAW_78073.
8. <https://rosinfostat.ru/chislennost-naseleniya/>
9. Voskanyan Y. et al. Management of the Flow of Patients in a Modern Medical Organization. 2022 T. Antipova (Ed.): DSIC 2021, LNNS 381, 456–466 (2022). https://doi.org/10.1007/978-3-030-93677-8_40
10. Voskanyan Y., Shikina I., Gasparyan A., Davidov D. Human Factor in Safe Health Care. *J. Digit. Art Humanit.*, 3(1), 29-35 (2022). https://doi.org/10.33847/2712-8148.3.1_4
11. Voskanyan Y., et al. Multifactorial model of adverse events and medical safety management. *J. Digit. Sci.* 2(1), 29 – 39 (2020). https://doi.org/10.33847/2686-8296.2.1_3
12. Voskanyan Y., et al. Risk management in the healthcare safety management system. *J. Digit. Sci.* 3(1), 41-53 (2021). https://doi.org/10.33847/2686-8296.3.1_4
13. Zakharchenko O., Terenteva D., Shikina I. Detectability of oncological diseases in the process of clinical examination of the adult population of Russia in 2013-2020. *J. Digit. Sci.* 4(1), 78 – 84 (2022). https://doi.org/10.33847/2686-8296.4.1_7
14. Golubev N., Polikarpov A., Shikina I., Shelepova E. Impact of the Income Level of the Working- Age Population on Certain Mortality Indicators in Russian Federation. 2022 T. Antipova (Ed.): DSIC 2021, LNNS 381, 467–476 (2022). https://doi.org/10.1007/978-3-030-93677-8_41
15. Antipova T. Health Digital Indicators' Juxtaposition. *J. Digit. Sci.* 5(1), 55-62 (2023). https://doi.org/10.33847/2686-8296.5.1_6
16. Antipova T., Zhelnin A., Zhelnina I. Briefs in Assessing the Adequacy of Health Care Facilities' Fixed Assets. *J. Digit. Sci.* 4(1), 85 – 91 (2022). https://doi.org/10.33847/2686-8296.4.1_8.
17. Antipova T. Need for High-Tech Medical Devices in Value-Based Health Care. *Advances in Digital Science*, 50-62, 2022. https://doi.org/10.33847/978-5-6048575-0-2_4.
18. Shlyifer S., Shikina I. High-Tech Heart Surgery in Elderly Patients in Russia. *J. Digit. Art Humanit.* 4(1), 43-49, (2023). https://doi.org/10.33847/2712-8148.4.1_6

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Topics to be discussed in this journal include (but are not limited to) the following: Digital Artwork; Excerpts from Digital Economics; Excerpts from Digital Education; Excerpts from Digital Engineering; Excerpts from Digital Photographs; Excerpts from Digital Technology & Applied Science; Excerpts from Psychology in Digital Age; Language & Linguistics in Digital Age; Literary Reviews of Criminology & Penology; Record Review of Social Media; Record Review of Information Systems; Religion & Theology in Digital Age; Script of Cyber Security; Script of Digital Public Administration; Script of Digital Pedagogical Technology; Script of Movie/Film; Script of Virtual Reality; Television & Radio in Digital Age; Theater in Digital Age.

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