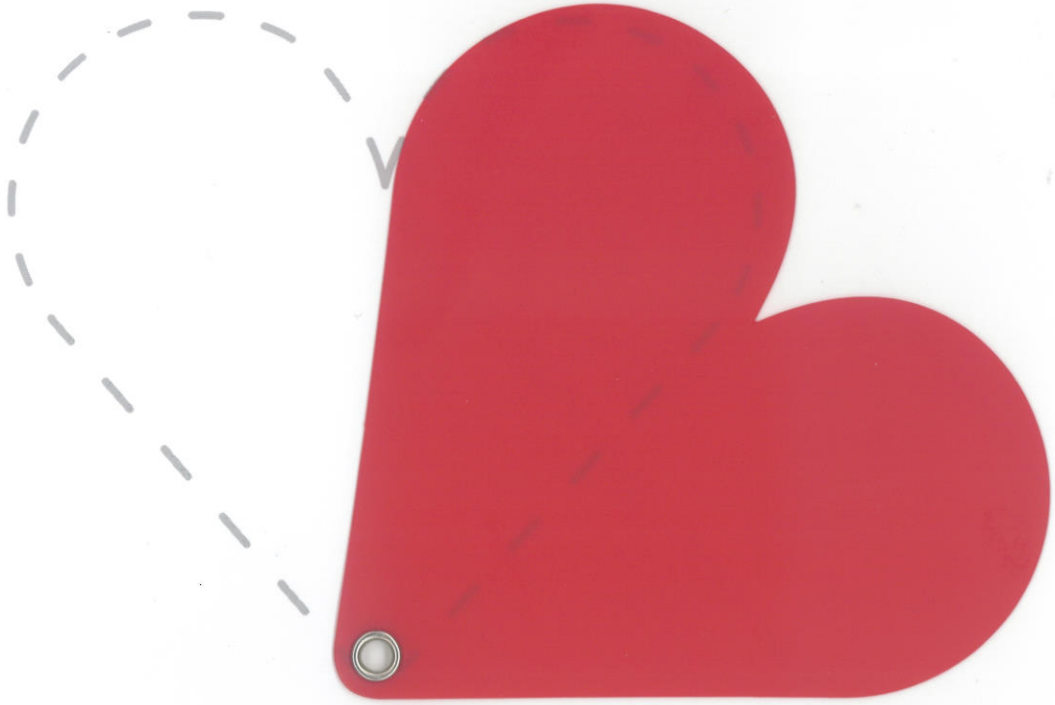


Life flows

Life flows

2007 Annual Report of the Slovenian Blood Transfusion Service

From heart to heart

Index:

From heart to heart

Blood feeds the human body as the river of life. It finds its way to even the most remote corners, enacting the miraculous story of life which nourishes and protects our body day after day.

People tell stories as well. Each has his or hers and sometimes these stories intersect where one least expects it.

Donated blood has changed many a sad story into a happy one, and those who were involved in these stories are well aware of the invaluable gift they have received.

Therefore, we would like to thank all blood donors who give of their heart, because their noble actions enable human stories to continue and interweave at times when patients need this the most.

Life also flows in institutions

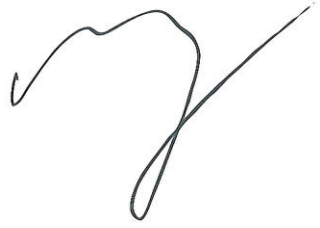
The fact that, for the time being, transfusion medicine is the only medical field within the scope of public health care that is precisely regulated by European Directives and defined by appropriate standards, has led Slovenia to adopt legislation that is harmonised with European legislation. The above-mentioned legal documents require the unification of the operations of the Transfusion Service, as well as transparency in supplying medical institutions with blood and blood products. Naturally, they also require continual development and maintenance of the quality system.

An important part of our activities involves taking care of those exceptional individuals who are blood donors or donors of cells, tissues and organs, who give of themselves selflessly and with the greatest concern for people in distress, who give the most that they can give, i.e. a part of their body. It is our continual goal to process their donated blood and cells such as to prepare sufficiently large quantities of safe, high-quality blood products for all patients who need them. The quick development of transfusion medicine and its support specialties, including activities related to transplantation, cell and tissue therapies, regenerative medicine and biobanks, requires the introduction of the most modern technologies to increase the safety of our products. It is also important not to undervalue the specific knowledge which is invested by professionals of various educational profiles into research and development and the implementation of individual processes. All of this contributes greatly to the added value of each of our products.

Two indispensable elements which ensure that our work is performed in accordance with European standards and the expectations of those who use our products and services are the unified information system in the Slovene Transfusion Service, and the comprehensive quality system, which constitutes a kind of an umbrella over all our activities. The current DATEC information system is outdated, so we are intensively preparing for its replacement. This is because the quality system completely permeates all of our work and has to be continually improved and upgraded. It is also important to note that in 2007 it was again tested with particular care and precision and verified by accredited external auditors. Furthermore, the long-awaited process of reorganising the Transfusion Service in the Republic of Slovenia was finally started in 2007. With the support of the Ministry of Health, it is expected to be further intensified in the coming years so as to achieve the desired goal of complete comparability with the respective European systems.

We would also like to thank all blood donors and our colleagues throughout the country for their precious contributions in ensuring that Slovenia has enough safe blood and blood products available at any moment.

Head Physician Marjeta Potočnik, MD,
Transf. Med. Spec.
Acting Medical Director of the BTCS



BTCS Director:
Asst. Prof. Matjaž Jeras, BS (Pharm.), PhD

»In am pleased that through my work I can contribute to the continued organisation of blood donation sessions in Slovenia, through which we make sure that enough blood is available for Slovene patients at any time.«

***Boštjan Novak,** BA (Soc.)*
National Coordinator for Blood Donation Sessions and
Professional Associate for Blood Donation with the Red Cross of Slovenia

Transfusion Service in Slovenia

Blood collection

In 2007, the Red Cross of Slovenia organised 1,500 blood donation sessions throughout Slovenia through its regional associations. The Transfusion Service conducted these sessions in the premises of transfusion services and in the field. Field blood donation sessions are performed by field teams from the Blood Transfusion Centre of the Slovenia (BTCS), the Blood Transfusion Centre at the Maribor University Medical Center (UMC), and the Celje Transfusion Department. A total of 350 blood donation sessions were undertaken in the field.

In 2007, there were 97,055 registered blood donors in Slovenia, regardless of their form of organisation. In general, the trend of movement in the number of blood donors has been uniform in recent years.

In the year 2007, 10,271 persons donated blood for the first time, i.e. 11% of all registered blood donors.

97,055 people reported for blood donation, among whom 36% were female and 64% male.

A total of 86,264 blood collections were performed, including 610 plasmaphereses and 1,207 platelet aphereses.

Among 58,985 blood donors in 2007:	
64%	donated blood once
27%	donated blood twice
8%	donated blood three times
1%	donated blood four times

Number of registered blood donors, collections and deferrals by location in 2007

Transfusion site	No. of registered donors	No. of collections	No. of deferrals
Celje	9,900	9,340	560
Izola	5,496	5,155	341
Jesenice	2,598	2,478	120
Maribor	12,457	10,709	1,748
Murska Sobota	4,680	4,330	350
Nova Gorica	3,366	3,069	297
Novo mesto	4,440	3,900	540
Ptuj	3,374	3,195	179
Slovenj Gradec	2,907	2,768	139
Trbovlje	1,350	1,302	48
BTCS Ljubljana	46,487	40,018	6,469
Slovenia	**97,055**	**86,264**	**10,791**

Blood collection in Slovenia

»This is something with which I can help other people. With my 477 donations so far, I have donated about 230 litres of blood and have likely saved a few lives.«

Rafael Poljanšek
Pensioner from Idrija
Blood donor

Blood processing

Collected whole blood units are separated into specific elements, i.e. individual blood components. This is done using physical methods, for example centrifugation and filtering. In this way, the same number of blood cells, e.g. erythrocytes or platelets, as is contained in the entire bag of whole blood is obtained in a smaller volume of each individual blood component.

Since one bag of whole blood can be used to prepare concentrated erythrocytes, concentrated platelets and fresh frozen plasma, these three components can be used for the treatment of three patients, each of whom needs only one blood component.

Individual elements of blood deteriorate at different rates after blood collection, therefore blood should be processed as soon as possible.
It is best to do this within six hours, but not more than 24 hours after blood collection.
Due to different properties and survival times of individual blood cells and plasma elements, different temperatures and centrifugation speeds are used during blood processing. Pre-prepared blood components, which have different shelf lives, are also stored under appropriate conditions:

- **Concentrated erythrocytes**
  Temperature: +2 °C to +6 °C
  Shelf life: 35 to 42 days

- **Concentrated platelets**
  Temperature: +20 °C to +24 °C
  Shelf life: up to 5 days, with constant mixing in an agitator

- **Fresh frozen plasma**
  Temperature: below -25 °C
  Shelf life: 2 years

Number of blood component units prepared from whole blood by location in 2007

Transfusion site	No. of units conc. erythrocytes	No. of units conc. platelets	No. of units fresh frozen plasma
Celje	9,276	4,096	9,276
Izola	5,514	293	5,091
Jesenice	0	0	0
Maribor	19,430	9,162	19,320
Murska Sobota	0	0	0
Nova Gorica	0	0	0
Novo mesto	2,211	41	2,267
Ptuj	0	0	0
Slovenj Gradec	1,842	67	1,859
Trbovlje	0	0	0
BTCS Ljubljana	45,534	26,539	45,889
Slovenia	**83,807**	**40,198**	**83,702**

Processing of collected whole blood to blood components

»I am happy that through my work, which is related to the processing of collected blood, I can contribute to the provision of blood components to fulfil the needs of Slovene patients.«

***Nataša Korenčan,** BS (Nursing)*
BTCS, Blood Supply Department

Blood testing

The purpose of blood supply is to provide safe blood for transfusion. Blood safety means that there are no adverse reactions in the recipient. Above all, blood for transfusion must not contain viruses or bacteria that cause AIDS, hepatitis B and C, or syphilis. Hepatitis B, hepatitis C and AIDS are chronic infectious diseases.

Patients and the general public appreciate all of the effort and measures to reduce the risk of infection, as they expect a safe blood supply. Therefore, one of the main measures for achieving the highest possible safety of blood supply is through so-called screening of blood units collected for transfusion."

Screening tests are done to find out whether blood units intended for transfusion might be potential sources of infection. These tests enable direct detection of the viral content (or the content of other microorganisms) in blood, although they sometimes provide only indirect detection of markers of infection.

Although nowadays transfusion is a safe form of therapy, there is still a risk of transmitting hepatitis B and C viruses as well as HIV via blood. This is due to the so-called diagnostic window, i.e. the time which elapses between the occurrence of infection and the appearance of antibodies which can be detected by serological tests. During this period, the risk of transmitting viruses is still present and can be prevented only by additional testing for nucleic acids of the above-mentioned viruses using the so-called nucleic acid testing (NAT method).

Results of screening tests of collected blood units in Slovenia for 2007

(N = first-time blood donor; R = regular blood donor)

Year 2007	No. of tested blood unitst	New blood donors	HBsAg	ANTI-HCV	ANTI-HIV	ANTI-TP
Slovenia Total	**84,586**	**10,271**	**11 N**	**10 N**	**1 N**	**10 (6N, 4R)**
Testing site Ljubljana	54,858	7,001	9 N	6 N	1 N	6 (4N, 2R)
Testing site Maribor	29,728	3,270	2 N	4 N	0	4 (2 N, 2 R)

In 2005, screening tests began to be performed only in Ljubljana and Maribor.

In Slovenia, about 90,000 units of donated blood are tested each year. The number of blood donors is lower than the number of actually donated blood units, as some blood donors donate blood 3 to 4 times a year. The greatest number of viral infections is found among first-time blood donors, i.e. those giving blood for the first time, and only 7 to 12 % of newly diagnosed infections are found among regular blood donors.

Testing of blood for infection markers **using indirect serological tests**

Results of screening tests using direct detection of viruses or their nucleic acids: HCV RNA in blood donors in Slovenia for 2007

Year	Number of tested people	Anti-HCV neg. HCV RNA pos.	Anti-HCV pos. HCV RNA pos.	Anti-HCV pos. HCV RNA neg.	Total No. HCV pos.
2007	84,896	1	9	0	10

Results of screening tests using direct detection of viruses or their nucleic acids: HBV DNA in blood donors in Slovenia for 2007

Year	HBV DNA pos. HBsAg neg. (diagnostic window)	HBV DNA pos. HBsAg neg. (Occult hepatitis B)	HBsAg pos. HBV DNA pos.	Total No. HBV POS
2007	0	6	11	17

Results of screening tests using direct detection of viruses or their nucleic acids: HIV RNA in blood donors in Slovenia for 2007

Year	Anti-HIV neg. HIV RNA pos. (diagnostic window)	Anti-HIV pos. HIV-1 RNA pos.	Total No. HIV POS
2007	0	1	1

A total of 423,240 tests were performed to ensure blood safety.

In Slovenia, each donated blood unit is tested for infection markers using indirect serological tests and direct detection of viral nucleic acids (NAT method).

Testing of blood for infection markers using indirect serological tests is done at the Blood Transfusion Centre of Slovenia and at the Blood Transfusion Centre at the Maribor UMC, for the following pathogens:

- **Syphilis:** anti-Treponema Pallidum (since 1960),
- **Hepatitis B:** HBsAg (since 1970) and HBV DNA (since 2007),
- **Aids:** anti-HIV1/2 (since 1986) and HIV 1 RNA (since 2007),
- **Hepatitis C:** anti-HCV (since 1993).

Testing of blood with direct detection of viral nucleic acids is done only in Ljubljana (i.e. since 2000 for HCV RNA and since 2007 for HCV RNA, HBV DNA and HIV RNA).

The donated blood units are also typed for AB0 groups, Rh phenotype and Kell blood groups and they are tested for the presence of any unexpected erythrocyte antibodies (ICT – indirect Coombs test).

Testing of blood with **NAT** methods

»I feel proud when I look back at 29 years of service at the Blood Transfusion Centre of Slovenia, where my job is to make sure that donated blood is free of any viral infections.«

***Zdenka Dolinšek,** Senior Sanitary Technician*
BTCS, Department of Diagnostic Services

Distribution of blood components

In Slovenia, blood for patients is issued by the BTCS, all transfusion departments and the hospital blood bank at the Postojna Hospital for Female Diseases and Obstetrics, the Kranj Hospital for Gynecology and Obstetrics and the Brežice General Hospital.

No. of blood components from whole blood issued to patients in 2007:

76,369	concentrated erythrocytes,
27,364	concentrated platelets,
30,953	fresh frozen plasma.

Distribution of blood components

Hemovigilance system

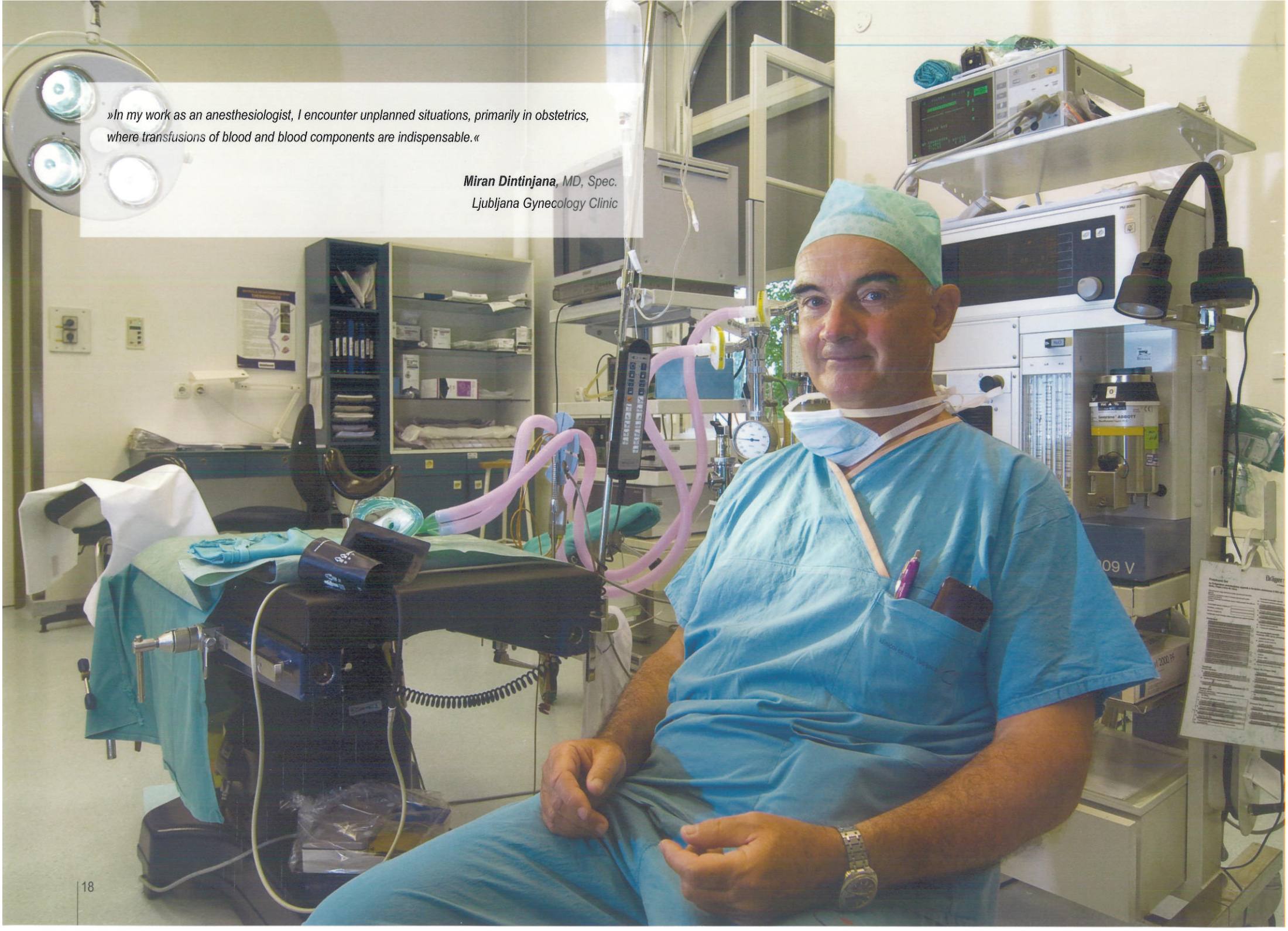
The use of any medicine is associated with a risk of adverse reactions, and blood transfusions are no exception to this.

Along with the numerous above-mentioned activities for the provision of high-quality and safe blood supply, the Blood Transfusion Service also runs a hemovigilance system to monitor the adverse reactions of transfusions.
All information passed within the framework of hemovigilance improves the safety of transfusion therapy and explains the risks of occurrence of adverse reactions of transfusion therapy and how to reduce this risk by implementing additional measures.

Number and type of reported adverse reactions from blood transfusions in Slovenia in 2007	
Hemolysis	3
Graft versus host disease	0
Transfusion related lung injury/pulmonary edema	0/14
Post-transfusion purpura	0
Allergy/Anaphylaxis	65/3
Non-hemolytic febrile reaction	88
Bacterial or viral infection	3
Other	9
Total	**185**

»As a physician-hematologist and a blood donor, I am well aware that modern treatment of blood diseases and bone marrow transplantation would not be possible without sufficient amounts of donated blood.«

Head Physician ***Jože Pretnar,*** *MD, Internist*
Hematological Department of the Ljubljana University Medical Center



»In my work as an anesthesiologist, I encounter unplanned situations, primarily in obstetrics, where transfusions of blood and blood components are indispensable.«

***Miran Dintinjana**, MD, Spec.*
Ljubljana Gynecology Clinic

Diagnostic and therapeutic services

As part of immunohematological tests, the Blood Transfusion Service performed:	
117,364	compatibility tests
79,383	AB0 and RhD blood typing tests
48,994	indirect Coombs tests
12,610	direct Coombs tests
2,846	specifications of erythrocyte antibodies
5,023	tests for HDN prevention
1,067	tests for detecting platelet antibodies
46	granulocyte tests
99	molecular biology tests

As part of microbiological tests, the Blood Transfusion Service performed the following ones for patients and other subjects:	
6,124	tests for hepatitis A virus
56,202	tests for hepatitis B virus
17,750	tests for hepatitis C virus
17,258	tests for HIV infection
13,606	tests for antibodies against Treponema pallidum
280	tests for antibodies against CMV

The following therapeutic services were performed:	
1,784	collections of autologous blood
1,253	therapeutic collections of whole blood
131	collections of hematopoietic stem cells from venous blood
87	transfusions of hematopoietic stem cells
1	procedure for concentrating bone marrow using a cell separator
3	procedures for collecting and storing umbilical blood
2	therapeutic plasmaphereses

By performing immunohematologic and immunogenetic tests, the BTCS also participates in the preparation of patients for transplantation of various organs and tissues. In 2007, 31 kidneys, 11 hearts and 10 livers were transplanted in Slovenia, along with 96 transplantations of hematopoietic stem cells, 67 of which were autologous, 18 were from a related donor and 11 from an unrelated donor.

Bone marrow registry

The transplantation of bone marrow (BM) and hematopoietic stem cells (HSC) is primarily applicable in the treatment of malignant and some nonmalignant diseases of the bone marrow and other hematopoietic organs (leukemia, mielodysplastic syndrome, disseminated plasmocytoma, malignant lymphoma, severe forms of aplastic anemia).

BM transplantation can be used to treat certain solid tumours, as well as some hereditary and autoimmune diseases.

This method of treating the above diseases is the only one which completely cures the majority of patients and enables them patients to start a new life.

Hematopoietic stem cells can be taken either from the bone marrow or from venous blood.
In the first type of donation, the so-called classic or surgical bone marrow removal, which is done under general or local anesthesia, a special sterile needle and syringe is used to withdraw 2 to 3 percent of red bone marrow from several sites on the flat pelvic bone. This procedure lasts 1 to 2 hours. As a rule, the donor is admitted to the hospital the day before bone marrow donation and can leave the hospital the day after it. All of the prescribed medical tests are performed before bone marrow donation, including those which are necessary for anesthesia. A week or two before bone marrow donation, the donor's own blood is collected at the BTCS so that it can be returned to the donor after the completed procedure in the form of an autotransfusion in order to replace the removed volume of fluid tissue.

The other procedure, i.e. the collection of hematopoietic stem cells from venous blood, is done on an outpatient basis, which means that the donor may return to their workplace or to his/her home immediately after completing the donation.

Five days before donation, the donor is given twice daily subcutaneous injections of a drug to promote the proliferation of hematopoietic cells in the bone marrow and their migration to blood. During this time, the donor usually experiences moderate pain in the bones and muscles, including nausea or headache (flu-like symptoms). Using a special automated procedure called apheresis, in which blood flows through a needle and a system of tubes into a special machine, hematopoietic stem cells are separated from the rest of the blood and collected in a special bag. The collection of these cells with a special apparatus lasts between 4 and 6 hours, and the procedure is similar to the collection of platelets. In this collection method, only hematopoietic stem cells are removed, while all other blood components are returned to the donor.

The risk involved in bone marrow donation is minimal for donors. The collection of blood marrow may lead to very rare complications either due to anesthesia or, in exceptional cases, due to hemorrhage or infection at the collection site.
Donors may certainly feel mild pain at the collection sites for some time, but not longer than one or two weeks. As was mentioned above, during the collection of HSC from venous blood the donor feels pain because he/she is administered a drug that promotes HSC multiplication, but this pain ceases a day or two after the last administered dose. However, the donation itself poses no major risk in terms of impairment of the bone marrow or the immune system, or any other disease.

In 2007, 1084 new bone marrow donors were recruited. Thus, the Slovenia Donor registry contained 9069 donors by the end of 2007.

»As a paramedic, I never expected to have a severe accident myself. I am grateful that among other things, donated blood helped me survive severe injuries which I sustained while on an emergency call.«

Peter Napotnik, *Medical Technician Paramedic*

Important news in 2007

Significant new developments in 2007, to which we would like to draw attention, were as follows:

- preparation of new order forms for blood components, medicinal products derived from blood and therapeutic and diagnostic services,
- automation of laboratory tests for prenatal diagnostics,
- upgrading of the telemedicine system for diagnostic services,
- installation of a tubular carrier system for the transfer of patient blood samples, order forms and blood components between the BTCS and the Ljubljana UMC,
- introduction of automatic processing for collected whole blood,
- viral inactivation of platelet components.

Some of the new features are also described in greater detail in the text below.

Order forms for blood components, medicinal products derived from blood and therapeutic and diagnostic services

The Blood Transfusion Centre of Slovenia in Ljubljana has prepared and introduced specific forms for ordering blood components and for performing diagnostic and therapeutic services. The new order forms are harmonised with the Regulations on transfusion tests and transfusion-related procedures and the Regulations on the content of records related to the use of blood, blood products and medicinal products derived from blood, including biotechnological blood substitutes, as well as with the new professional requirements.

Several types of order forms have been drawn up. The one most commonly used is the form for ordering blood components and certain medicinal products prepared from blood. The existing order form for therapeutic services, such as autologous transfusions, therapeutic venepuncture and collection of hematopoietic stem cells, has been updated as well.

For tests conducted during pregnancy and after childbirth, another order form was designed that contains all immunohematological tests which need to be done during pregnancy. The order form for platelet and granulocyte tests serves as the basis for serological and molecular-biological assays for detecting platelet and granulocyte antigens and antibodies.

On the order form for microbiological tests, individual test packages were reasonably combined: package of basic screening tests, prenatal testing package, potential cadaveric donor (PCD) testing package and testing package to be used after potentially infected needle prick. Apart from test packages, it is also possible to order individual tests related to infections with hepatitis virus A, B and C, HIV virus ½, and the bacterium Treponema pallidum.

Furthermore, an order form was designed for HLA typing and for establishing tissue compatibility before transplantation of hematopoietic stem cells or organ transplantation, as well as an order from for HLA typing to aid in the diagnosis of certain specific diseases (rheumatoid arthritis, ankylosing spondylitis, sacroileitis, psoriasis, celiac disease, multiple sclerosis etc.).
Bar code labels, which are used to mark blood samples and thus link samples with the corresponding orders via the computer system, thereby preventing any errors and mix-ups, are also an important improvement associated with new order forms.

It is estimated that new order forms will significantly contribute to the greater safety and transparency of our work and thus preclude the need to take unnecessary additional blood samples for transfusion tests. Above all, they will also provide support for the subsequent introduction of electronic ordering of transfusion tests and blood products.

Automation of laboratory tests for prenatal diagnostics

In order to ensure a completely positive identification of the samples, reagents, diluents, gel cards and microplates, and to foster complete traceability of the performed tests, obtained results, used diluents and reagents, and the related operators, the Laboratory of Prenatal Diagnostics decided to introduce complete automation of all immunohematological tests which are done during pregnancy and upon childbirth.

The system for the automation of tests consists of the Swing II laboratory robot and Saxo gel card reader, along with the corresponding software.

The Swing II laboratory robot's capacity is 24 gel cards. Within one hour, this system can perform various procedures from pipetting and centrifuging to the reading and interpretation of results, which are then transferred to the DATEC information system.

With the Swing laboratory robot and correct interpretation of the results using the Saxo laboratory reader, and subsequent reliable transfer of these results to the DATEC information system, the BTCS introduced a correct, quick and high-quality method for the performance of immunohematological tests in its Laboratory of Prenatal Diagnostics.

It was shown that archiving of test results for automated, machine-performed tests is transparent, safe and complete, and tracking is ensured for all procedures throughout the work process.

Telemedicine in Slovenia

Since 2003, the Blood Transfusion Centre of Slovenia has been conducting a project of national significance entitled Teleconsultations in the Transfusion Service, within which teleconsultations are introduced in the Slovene Transfusion Service, in line with the professional and organisational needs of the Transfusion Service. The introduction of teleconsultations is also in compliance with the Blood Supply Act (Official Gazette of the Republic of Slovenia, No. 104/06) and with the Regulations on Transfusion-Related Tests and Procedures (Official Gazette of the Republic of Slovenia, No. 9/07), which stipulate the setting up of a legally prescribed transfusion telemedicine network. The Blood Transfusion Centre of Slovenia and general hospitals conclude written agreements with transfusion departments in order to comply with the requirements stated in the provisions of the above-mentioned act and regulations, stipulating compulsory inclusion of transfusion departments into the national transfusion telemedicine network.

Teleconsultations

In Slovenia, transfusion services are performed at ten transfusion departments and at the BTCS. A few hundred units of blood per day are distributed, a half of them at blood transfusion departments across the country, and the other half at the BTCS. For each blood unit that is distributed, various pre-transfusion tests are performed. These tests are done using the gel method, the results of which can also be photodocumented. The Transfusion Service operates on an uninterrupted basis (24/7) at all transfusion departments. However, the number of available transfusion medicine specialists is insufficient; therefore during on-duty hours the results of pretransfusion tests are read and interpreted by doctors of other specialties who have completed a postgraduate transfusiology course. If there are any unclear issues regarding the results of these tests, telephone contact is currently the only option for consulting a transfusion medicine specialist. Right now there is also another, more state-of-the-art technological solution, namely remote provision of medical services (so-called telemedicine), therefore a teleconsultation system, which is based on our own development, has begun to be implemented in the Slovene Transfusion Service.

Through the teleconsultation system, on-duty doctors can pose questions regarding professional issues to consultants located at transfusion centres. For example, in the case of ambiguous laboratory results, doctors can use the teleconsultation system to confer with a consultant from the transfusion centre. The on-duty doctor may prepare a question about a specific case, adding various patient data and diagnostic data obtained with the use of an apparatus for capturing images of laboratory tests based on the gel method. The system then searches for and adds any available prior results for the patient from the information system which serves to support transfusion medicine activities. Once a question is drawn up, it is included in the list of open questions for the consultant. The on-duty consultant located at the transfusion centre then processes these questions in the order of their arrival from individual institutions. On-duty doctors may also use a videoconference link to have a live teleconsultation with the on-duty consultant, and can thus promptly conduct all of the necessary activities in line with the consultant's instructions.

Setting up of the teleconsultation system

A teleconsultation system for the Slovene Transfusion Service has been set up at the BTCS and at six transfusion departments (pilot projects: Ljubljana–Trbovlje and Novo Mesto; first extension phase: Izola, Slovenj Gradec, Šempeter pri Novi Gorici and Jesenice; situation at the end of 2007). After the first phase, the system will consist of six terminals at individual transfusion departments, which will be linked to the teleconsultation centre in Ljubljana, while the transfusion departments will be clients using these teleconsultation services. The second extension phase is planned for 2008 and its purpose will be to add four more terminals. In the final phase, teleconsultations will be done from two centres, Ljubljana and Maribor. Teleconsultations with Ljubljana should take place from the Izola, Nova Gorica, Jesenice, Trbovlje, Novo Mesto and probably also Celje transfusion departments, while teleconsultations with Maribor should be performed from the transfusion departments of Slovenj Gradec, Murska Sobota and Ptuj. Teleconsultations should be done primarily during on-duty hours, because transfusion medicine specialists are continually present only at two locations, i.e. in Ljubljana and Maribor. At all other departments, work during on-duty hours is organised by including doctors of other specialties who have completed a postgraduate course in transfusion medicine and are trained only to read clearly negative

results of laboratory tests. Therefore, all doubtful test results may be the subject of teleconsultations. Teleconsultations during regular working hours are intended primarily for resolving more severe cases, because at that time transfusion medicine specialists are usually present at all departments. In these cases, teleconsultations mostly take the form of exchanging professional opinions, helping the inquiring doctor obtain a second opinion. During regular working hours, the system's increased activity is anticipated during the absence of transfusion medicine specialists at those departments where doctors of other specialties are responsible for reading laboratory test results.

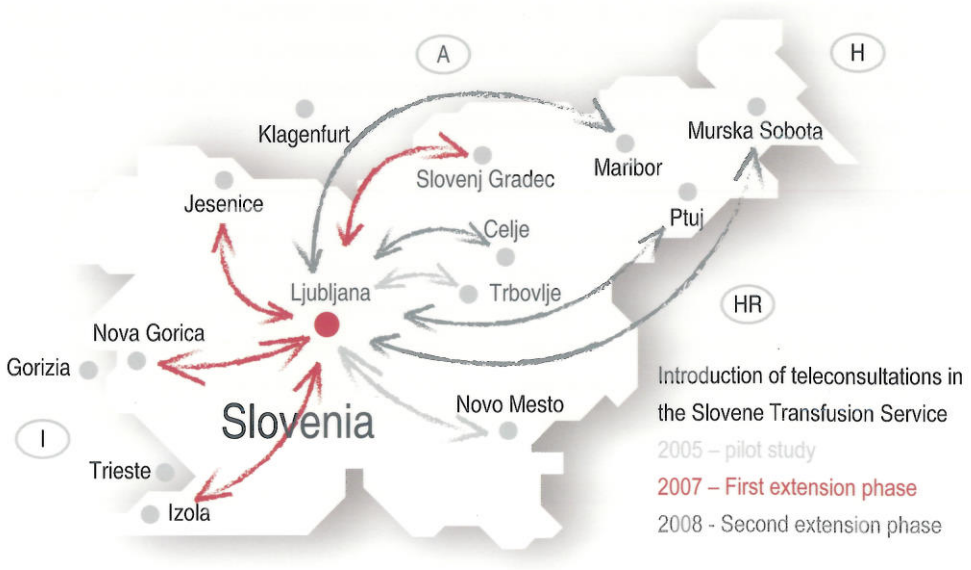
The system was upgraded with teleconsultations from home in order to reduce the workload of those transfusion medicine specialists from the transfusion departments of individual general hospitals who are constantly on call from their homes, even several times a week. In practice, this means that in the past, while they were on duty (i.e. from 15:00 p.m. to 7:00 a.m. of the next day), they had to come to their workplaces several times during their shift in order to resolve problematic cases. Now, they can resolve the majority of such cases from their home, using the teleconsultation link.

Introduction of teleconsultations in the Slovene Transfusion Service

Site	System introduced
Ljubljana	18.04.2003*
Trbovlje	13.10.2005
Novo mesto	18.11.2005
Slovenj Gradec	04.06.2007
Izola	12.06.2007
Šempeter pri Gorici	19.06.2007
Jesenice	15.11.2007
Celje	plan 2008
Ptuj	plan 2008
Maribor	plan 2008
Murska Sobota	plan 2008

* 18. 04. 2003: The date of the first telemedicine service within the Slovene Transfusion Service.

After completion of the pilot study in 2005, education of the system's users was initiated in 2006, and its trial use took place in 2007. Before their regular use, all systems have to undergo testing, validation and evaluation. The validation of this system comprised one hundred cases of consultations involving quantitative and qualitative comparisons of readings from digital images, with gel card readings done according to the standard methods. Minimal disparities were recorded concerning the quantitative evaluation of the results, but these were finally resolved with the third reading. In such cases, it was found that reading of laboratory results from digital images was more accurate. This is understandable, as digital processing enables image enlargement and thus provides a better visibility than reading of gel cards with naked eye. The results of the pilot study and experiences from the trial use of the system have shown that on-duty doctors tend to use teleconsultations in the field of transfusion medicine primarily for complicated cases and whenever their transfusion medicine specialists are absent from the department. There are still cases where due to a lack of diagnostic materials, patient blood samples need to be sent for additional testing with the standard method. Testing of the system has also shown that teleconsultations in the field of transfusion medicine enable transfusion services to be provided at an equal quality level throughout the country, and they are also quicker and cheaper. Therefore, regular operation of this system is planned to be introduced throughout the Slovene Transfusion Service.



Feature

Meeting of blood donors in Greece

7th meeting of the IFBDO international youth forum

From 23 to 26 August 2007, an international meeting of young blood donors took place in Greece, in the coastal resort Loutraki near the Corinthian Canal. On the initiative of the Slovene Consul in Greece and with the support of the Ministry of Health, it was attended by our colleague Petra Jovanovič, BS (Micr.) as the representative of Slovenia.

The meeting was organised by a Greek society called the Panhellenic Federation of Voluntary Blood Donor Associations (P.O.S.E.A.), i.e. by their youth association and the International Youth Committee of IFBDO (International Federation of Blood Donor Organizations). The participants of this forum were young people from individual IFBDO member states.
The participating countries were: Angola, Denmark, Estonia, France, Greece, Italy, Latvia, Malta, Romania and Spain. Each country was represented by two to ten people.

During the first evening, socialising and getting to know each other was combined with a presentation of advertising materials and activities which are conducted in individual countries to recruit voluntary blood donors and promote voluntary unpaid blood donations. During the following two days, there were various workshops in the morning and in the afternoon, at which the participants talked about the ways to approach young people in different communities and to present voluntary unpaid blood donation to them. They also discussed the significance of blood donor health, the current status of blood donation activities and associations in individual countries, and other related problems and activities.

The Slovene representative was surprised by the enthusiasm and dedication of the meeting participants to the promotion of voluntary unpaid blood donations, which is still the only way to ensure safe blood and is not to be taken for granted. The IFBDO organisation is well aware of that, and so are their youth sections in individual IFBDO member states. Therefore, each year's blood donation festivals, concerts, sports events and other events for the promotion and recruitment of blood donors in these countries are part of well-established activities. At the meeting, which takes place each year, the participants exchange their experiences and ideas and determine the guidelines for future work of the IFBDO.

The latest ideas for more effective contact with the young population included designing of a new website, setting up of a web forum and organising educational courses about voluntary unpaid blood donation in schools.

Young people, the sea and sunshine, along with plenty of enthusiasm over voluntary unpaid blood donation. Is anyone else tempted?

Investing in knowledge and innovation

The BTCS houses three research groups which comply with the criteria and requirements of the Slovenian Research Agency (ARRS) for managing national projects and performance of research activities. The BTCS is also a member of the Biotechnology and Pharmacy excellence centre. Within the framework of this centre, it participates as a partner in the research and development project entitled Development of New Medicines and Biochips.
(Duration: from 15 July 2004 to 14 June 2007)

In addition, BTCS researchers are also involved in the P4-0176 (D) national research programme: Molecular Biotechnology: From Dynamics of Biological Systems to Applications.
(Duration: from 1 January 2004 to 31 December 2008)
A list of all other scientific-research and developmental activities is shown below under the relevant categories:

International research projects

Bilateral Slovenian-German project entitled 'System Biology Tools Development for Cell Therapy and Drug Development', short name SYSTHER. It is conducted within the framework of the BTCS.
(Duration: from 1 November 2006 to 30 October 2011)

European projects financed by the European Community

Two projects were initiated last year:
Eubis European Blood Inspection System (Duration: from 2007 to 2010) and EuOBUP Optimal Use of Blood (Duration: from 2007 to 2010).

National research projects

More detailed data on national research projects coordinated by the BTCS and those in which the BTCS is a participating partner can be found at the web site: http://sicris.izum.si/

Projects managed by the BTCS

ARRS Code	Project Title	Duration
L4-6325	Development of tissue engineering bone substitutes for use in parodontology, traumatology and orthopedics	From 1 February 2004 to 30 January 2007
L3-6006	Prionic diseases and their diagnosis	From 1 July 2004 to 30 June 2007
L3-6011	Isolation, characterization and differentiation of human stem cells as the basis for cell therapy	From 1 July 2004 to 30 June 2007
L1-6295	Dendritic cells prepared from human monocytes – activators and modulators of specific immune responses	From 1 July 2004 to 30 June 2007
L7-7457	se of cultured skin substitutes for the treatment of chronic and acute wounds	From 1 September 2005 to 31 August 2008

Projects managed by other research institutions

ARRS Code	Project Title	Duration
J3-6072	Genetic background of chronic diseases in children and adolescents II	From 1 July 2004 to 30 June 2007
J3-6290	Treatment of unhealed and poorly healed fractures of long bones using platelet enriched plasma	From 1 July 2004 to 30 June 2007
L3-6265	of cultured autologous cartilage cells for the treatment of vesicourethral reflux	From 1 February 2004 to 30 January 2007
J1-6001	Chemical and biological tracing of neonicotinoids and their effects on the environment	From 1 February 2004 to 30 January 2007

Education

The following forms of education are performed as part of the Blood Transfusion Service's activities:

1. SECONDARY SCHOOL EDUCATION at the:

- Secondary School of Pharmacy, Cosmetology and Health Care,
- Medical Secondary School.

2. UNDERGRADUATE EDUCATION in transfusion medicine at the:

- Medical Faculty,
- Faculty of Pharmacy,
- aculty of Chemistry and Chemical Engineering,
- University College of Health Care.

3. POSTGRADUATE EDUCATION:

- internship for bachelors of science in pharmacy,
- specialization in clinical pharmacy and drug design,
- specialization in transfusion medicine,
- pecializations in other clinical specialties, such as surgery, orthopedics, gynecology and obstetrics, anesthesiology, clinical microbiology, internal medicine and pediatrics,
- course in transfusion medicine for health-care professionals with secondary, high, higher professional and higher education levels working in the field of transfusion activity at transfusion institutions and hospitals.

During the school year, all transfusion departments are visited by primary school students, primarily third and seventh grade students, as well as secondary school and university students, to be informed of blood collection activities and the activities of transfusion departments, as they are related to their school curricula.

Moreover, transfusion departments also perform educational courses for organizers of blood collection sessions with the Red Cross of Slovenia, and for bone marrow donors who are included in the register of unrelated donors.

In 2007, the BTCS organised the following trainings:

- The use of stem cells in cardiovascular and orthopedic tissue engineering: Basic research and strategies for translation into clinical applications,
- Equipment for blood banks,
- Pipetting techniques, sources of errors, and pipette calibration,
- Safe work with hazardous chemicals,
- Reanimation,
- Irradiator – operation and irradiation protection.

The BTCS employees also participated at many external training courses in 2007:

- Professional seminar of the Association of Transfusion Medicine and the Association of Hematologists of Slovenia (ZHS), Kranjska Gora,
- Professional seminar of the Association of Transfusion Medicine and the Association of Hematologists of Slovenia (ZHS), Podčetrtek,
- Biologicals and gene therapy, Portorož,
- 14th symposium of emergency medicine, Portorož,
- Workshop of the Syster project: Recent developments in tumor diagnosis and therapy, Piran,
- Legal aspects of commercial stem cell banks, Trieste,
- Genius future – genetics, determinism and freedom, Ljubljana,
- XVIIth Regional Congress, Europe International Society of Blood Transfusion, Madrid,
- Elimination of communication blocks for improvement of team work in leadership teams, Bohinj,
- Optimal perioperative treatment of anemia and safety of transfusion treatment, Portorož,
- Umbilical blood sampling – bioethical, organisational and technical aspects, Treviso,
- Management in laboratory medicine, Ljubljana,
- Professional seminars of the Association of Laboratory Technicians, Podčetrtek, Kranjska Gora,
- HSC collection – treatment and nursing of patients after HSC transplantation, Zreče,
- Professional meeting of the Executive Committee of the Section of Nurses and Medical Technicians for Anesthesiology, Intensive Care and Transfusion Medicine,
- Meeting of the transfusiology workgroup, Ljubljana,
- 6th congress of nursing and obstetric care – High-quality, effective and safe nursing, Ljubljana Ljubljana.

The BTCS also cooperates with the following international professional organisations:

- with the WHO, in the organization of workshops on implementing a high-quality and safe blood supply in Central and Eastern European countries,
- with the Sarajevo Institute of Transfusion Medicine, the BTCS traditionally cooperates in the education of their professionals on the introduction of cytaph ereses and bone marrow transplantations,
- with the Blood Bank and Institute for Production of Biological Products in Chengdu, China,
- with the Tissue Typing Laboratory, Dept. of Blood Group Serology, AKH in Vienna, Austria, in the field of sequencing and external quality controls (EFI),
- with the Immunogenetics & Transplantation Immunology Department of Immunohematology & Blood Bank in Leiden, the Netherlands (Eurotransplant reference laboratory), in the field of determining antibody allosensitisation and external controls (EFI),
- with the Tissue Typing Laboratory, University Hospital in Maastricht, the Netherlands, in the field of external quality controls (EFI),
- with the HLA Laboratory, BRK Blutspendedienst, Klinikum der Ludwig Maximilians Universität in Munich, Germany, in the field of HLA typing of unrelated HSC donors,
- with the UCLA Immunogenetics Center, Los Angeles, USA, in the field of external quality controls for serological HLA typing,
- with the AVIS Veneto Treviso, Italy, in the field of promotion of HSC donation,
- with the Treviso Cord Blood Bank, Italy, in the field of research of mesenchymal stem cells,
- with the CDC, Atlanta, USA, in the field of external quality controls for determination of HIV antibodies,
- with the VQC EQAS a part of WHO, in the field of external controls for serological and NAT testing for viral markers,
- through cooperation in various programs of external controls for infection markers (UK NEQAS Great Britain, Labquality Finland),
- with the CLB in Amsterdam, the Netherlands, in the field of prenatal testing,
- with the Blutspendedienst SRK in Bern, Switzerland, in the field of external quality controls for immunohematologic testing,
- with the UK National Blood Service in Manchester, Great Britain, in the field of external quality controls for anti-D quantitation,
- with the IBGRL, Red Cell Reference Department in Bristol, Great Britain, in the field of immunohematology.

Legislation

Health-Care Activities Act
(ZZDej, Official Gazette of the RS (OG RS), No. 36/2004)

Blood Supply Act
(ZPKrv, OG RS, No. 104/2006)

Medicinal Products Act
(OG RS, No. 31/2006)

Act on the Quality and Safety of Human Tissues and Cells Intended for Treatment
(OG RS, No. 61/2007)

Regulations concerning compulsory testing of blood and blood components
(OG RS, No. 9/2007)

Regulations concerning the collection, preparation, storage, distribution and transport of blood and blood components
(OG RS, No. 9/2007)

Regulations concerning transfusion-related tests and procedures
(OG RS, No. 9/2007)

Regulations on hemovigilance
(OG RS, No. 9/2007)

Regulations concerning professional standards and technical requirements for quality systems related to transfusion activities
(OG RS, No. 9/2007)

Regulations concerning the methods and type of access to documentation
(OG RS, No. 9/2007)

Regulations concerning professional medical standards for blood collection
(OG RS, No. 9/2007)

Regulations concerning the storage, distribution, transport and disposal of unused blood and blood products
(OG RS, No. 100/2002)

Regulations on the content of records related to the use of blood, blood products and medicinal products derived from blood, including biotechnological blood substitutes
(OG RS, No. 70/2003)

Regulations concerning the procedure for collecting, storing and using hematopoietic stem cells
(OG RS, No. 104/2003)

Regulations concerning the conditions for patients obtaining their own blood and collecting individual cells and blood plasma
(OG RS, No. 118/2003)

Regulations concerning the conditions for the organization and implementation of blood donation sessions
(OG RS, No. 92/2003)

Regulations on the work methods of the Medical Council for the supply of blood, blood products and medicines made from blood (OG RS, No. 39/2002)

Directive 2002/98/EC of the European Parliament and of the Council (dated 27 January 2003) setting standards of quality and safety for the collection, testing, processing, storage and distribution of human blood and blood components, and the Supplement to Directive 2001/83/EC

Directive 2005/62/EC of the European Commission (30 September 2005) on the implementation of Directive 2002/98/EC of the European Parliament and of the Council concerning Community standards and specifications relating to a quality system for blood establishments

Directive 2005/61/EC of the European Commission (30 September 2005) implementing Directive 2002/98/EC of the European Parliament and of the Council as regards traceability requirements and notification of serious adverse reactions and events

Directive 2004/33/EC of the European Commission (22 March 2004) implementing Directive 2002/98/EC of the European Parliament and of the Council as regards certain technical requirements for blood and blood components

Publications

Articles and other scientific and professional contributions

1.01 Original scientific articles

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1.04 Professional article

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1.07 Published professional article at a conference (invited lecture)

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