

The role of telemedicine in the organisation of blood transfusion service in Slovenia

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The aim of the presentation

To present:

- The telemedicine system in transfusion service
- The reorganisation of blood transfusion service in Slovenia
- The development and implementation of the telemedicine system in Slovenia
- The effects and benefits of using telemedicine in blood transfusion service in Slovenia



Abbreviations

TM system = Telemedicine system

BTS = Blood transfusion service in Slovenia

BTC = Blood Transfusion Centre of Slovenia, the
main national blood establishment in Ljubljana

CTM = Centre for transfusion medicine (Maribor, Celje)

CTS = Centre for transfusion service, i.e. remote
unit of blood establishment

Introduction of the BTS in Slovenia

- 2 million inhabitants
- Blood transfusion service of Slovenia consists of 3 main blood establishments:
 - Blood Transfusion Centre of Slovenia with its 6 remote units (CTSs) at other locations
 - Centre for Transfusion Medicine Maribor with its 2 remote CTSs
 - Centre for Transfusion Medicine Celje
- Transfusion numbers for 2012:
 - 62,000 blood donors (10% new donors)
 - 97,000 blood collections (45% mobile session)
 - 200,000 prepared components
 - Issued components:
 - 89,000 RBCs
 - 11,400 Platelets (8,000 BC + 3,400 apheresis)
 - 31,000 FFP



Telemedicine

Telemedicine is the delivery of healthcare services with the help of Information and Communication Technologies (ICT) in a situation where the actors are not at the same location.

- Acceptance of the request
- Audit of the request
- Transfusion lab tests performance
- Preparation of telemedicine session
- Remote interpretation and validation of the results
- Electronic signature
- Allocation and delivery of blood components



The basic concept of telemedicine activity = Open session → Question → Answer

LABORATORY TECHNICIAN
in
remote CTS without MD

- Acceptance of a request for blood
- Transfusion lab tests performance
- Preparing telemedicine session
- Sending question to a teleconsultant on duty

TELECONSULTANT
Transfusion medicine specialist

- Interpretation of laboratory results from gel cards
- Discussion on the case, optional order of additional tests
- Electronic signature
- Sending back the session with results

LABORATORY TECHNICIAN
in
remote CTS without MD

- Export of the results to transfusion IT system Datec
- Confirmation of the results in transfusion IS Datec
- Printing of the results
- Delivery of blood components

Digital data acquisition for remote reading

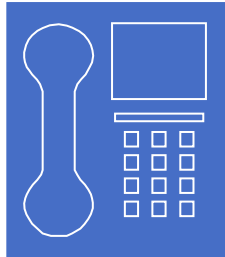
Scanned documents

Request, panel list, ...



Laboratory tests

Pretransfusion, prenatal tests:
ABO-RhD, Ab screening, XM...



Telephone consulting

Patient data from hospital
Professional discussion



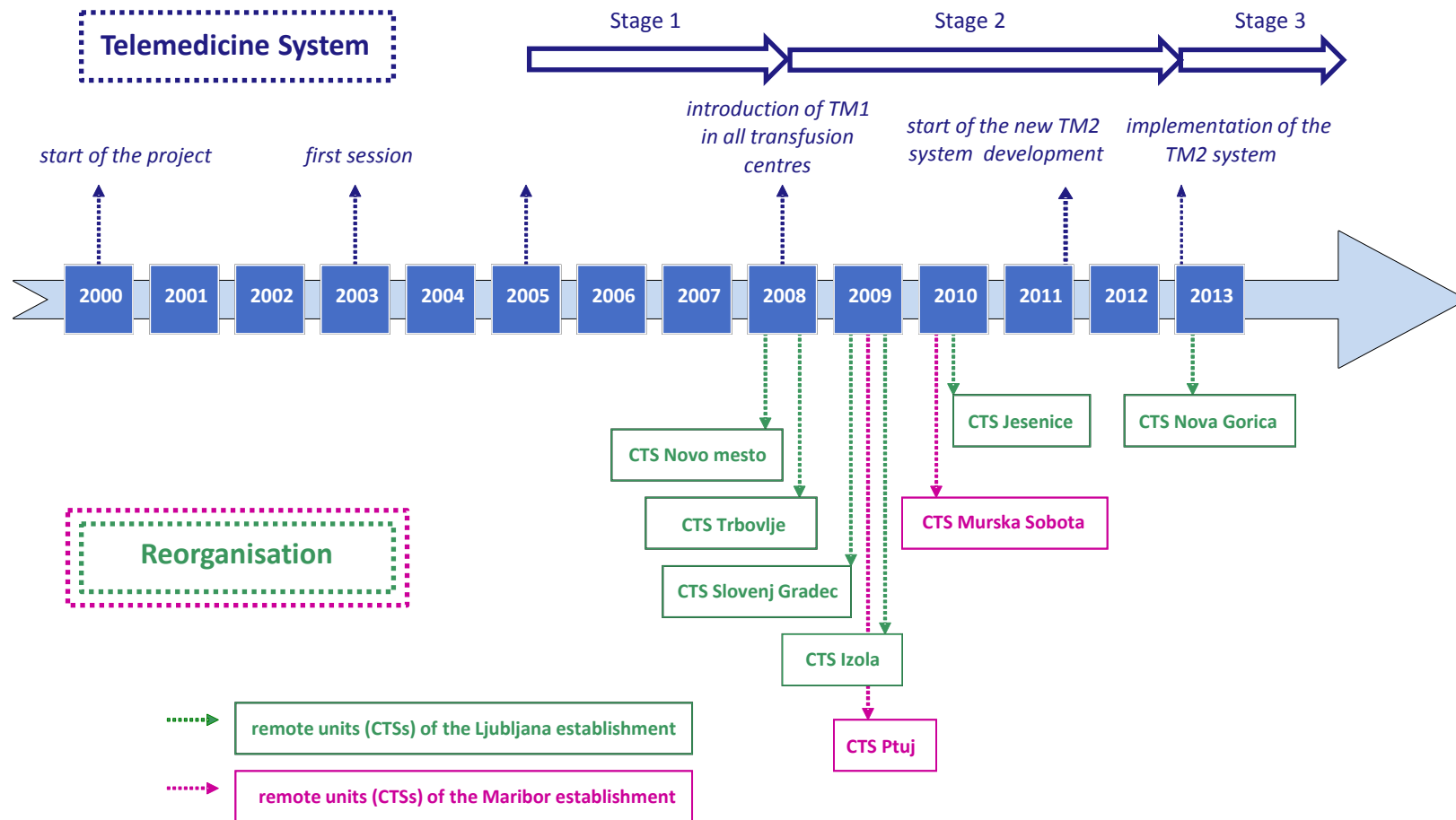
Data from host transfusion IS

Patient history, laboratory tests history
Donors data: ABO-RhD, ICT, ...



Transfusion medicine specialist

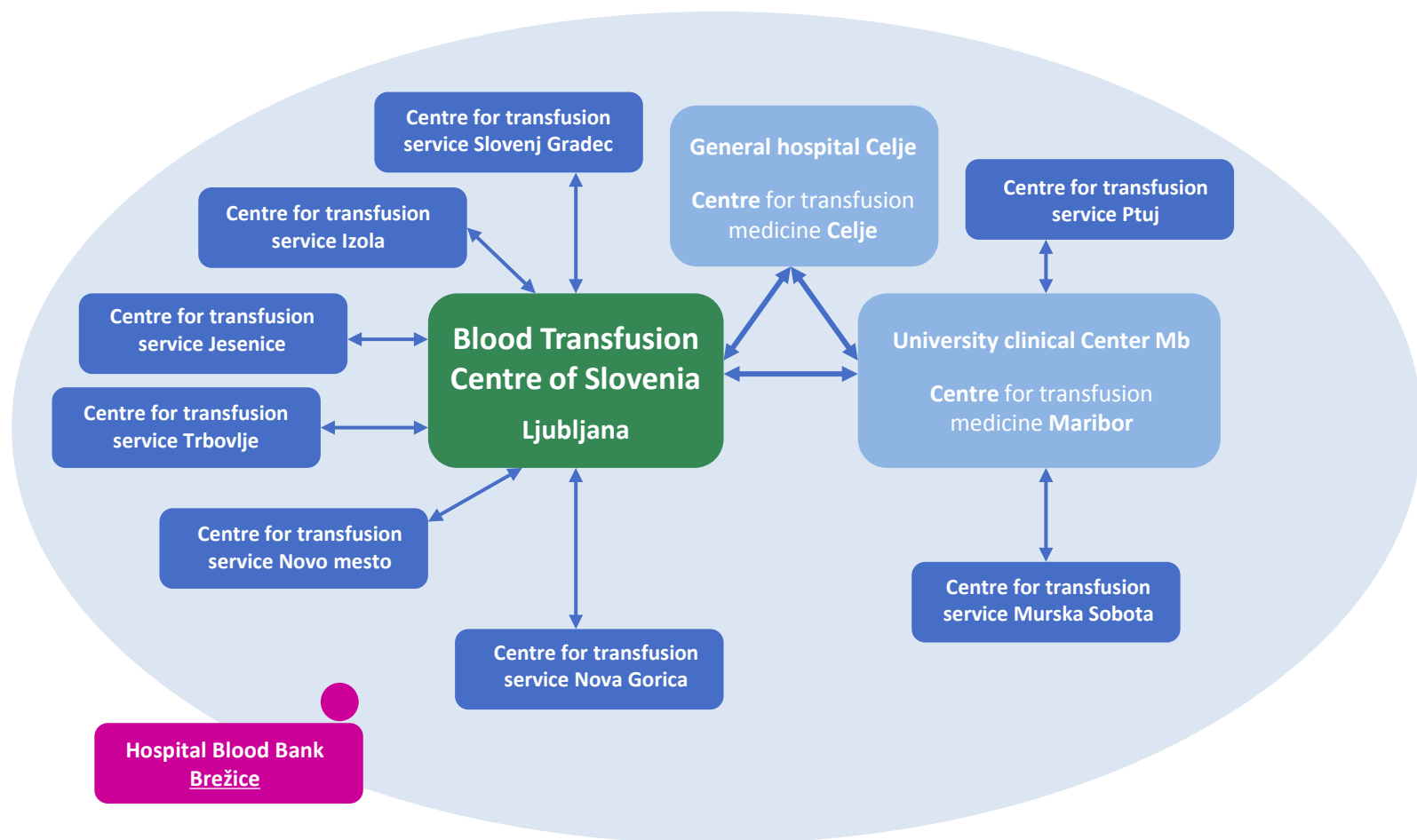
Timeline of telemedicine and reorganisation of BTS



Slovenian BTS before reorganisation



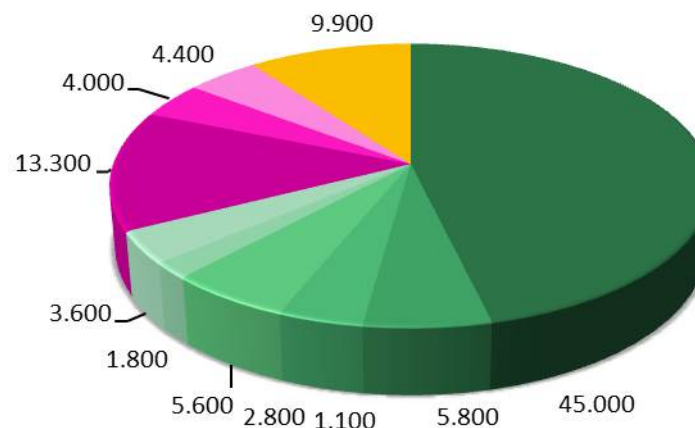
Actual organisation of BTS in Slovenia




Collected units in Slovenian BTS

Collected units in 2012

LOCATION	No of collected units/ year
BTC of Slovenia	45.000
CTS Novo mesto	5.800
CTS Trbovlje	1.100
CTS Slovenj Gradec	2.800
CTS Izola	5.600
CTS Jesenice	1.800
CTS Nova Gorica	3.600
LJUBLJANA	65.700
CTM Maribor	13.300
CTS Ptuj	4.000
CTS Murska Sobota	4.400
MARIBOR	21.700
CTM Celje	9.900
CELJE	9.900
SLOVENIA	97.300



Pretransfusion testing before reorganisation

- Performed at 14 locations:
 - 1 BTS of Slovenia
 - 10 transfusion departments at regional hospitals
 - 3 laboratories at (maternity) hospitals
 - Results were interpreted and validated by a transfusion medicine specialist or by trained clinicians from hospitals
 - Clinicians were trained in two weeks' course to release negative and expected results
 - In cases with positive or unexpected results, lack of experience could cause delayed transfusions, because the samples were sent to the BTC of Slovenia or CTM Maribor
- 

The idea for the development of TM system

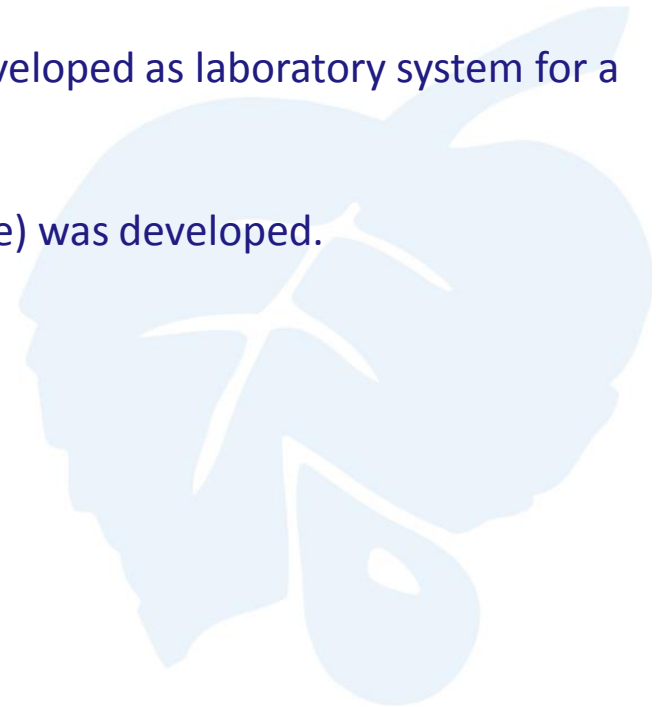
- Remote interpretation of pretransfusion tests by a TM specialist:
 - for professional discussion between two TM specialists in solving special cases
 - to advise clinicians on duty who are involved in interpretation and validation of pretransfusion testing for their patients
 - to reduce sending blood samples to Reference laboratory by selection of cases
 - to speed up the blood components release



The development and implementation of TM1

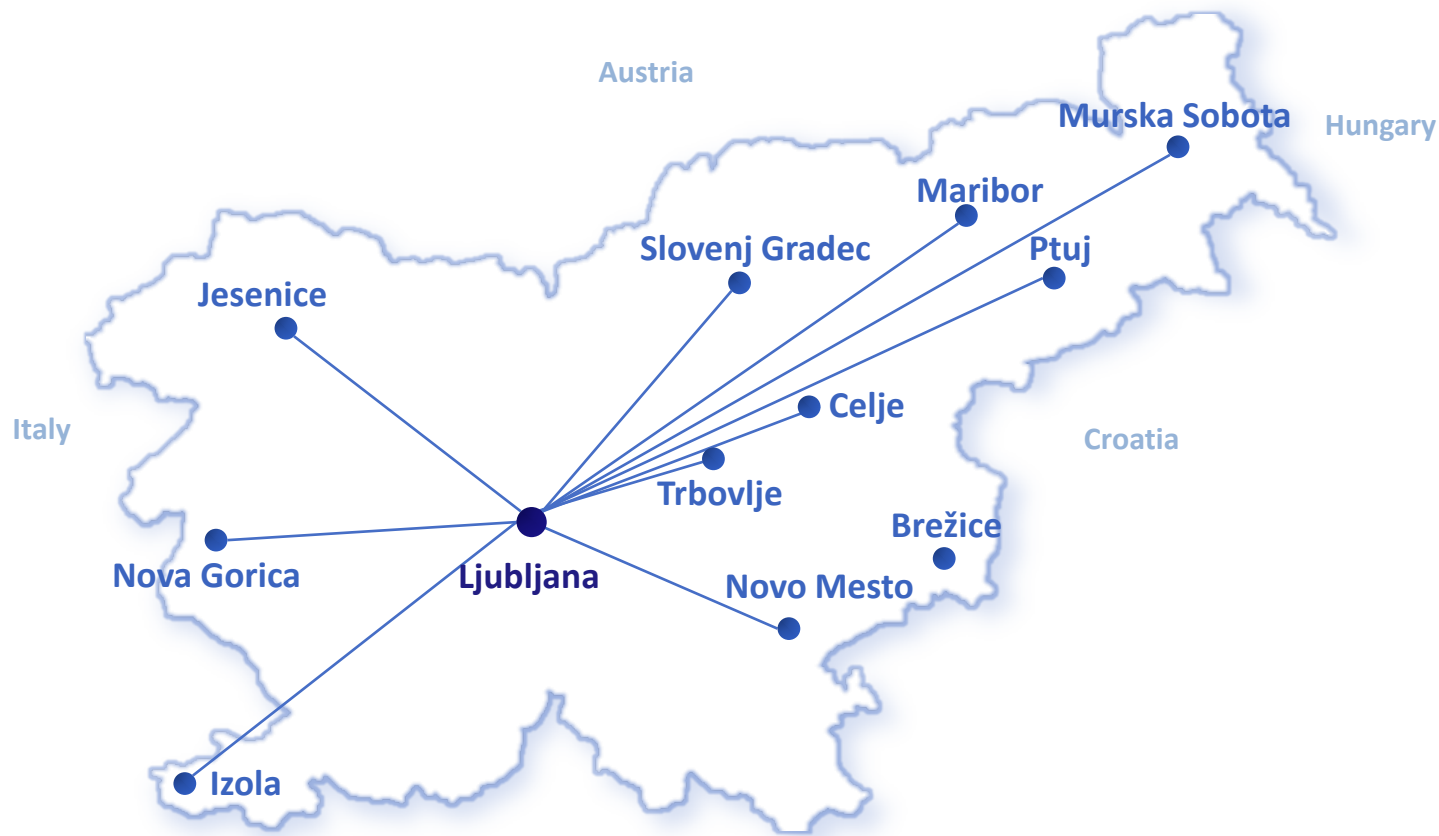
Stage 1

- TM1 system was developed in cooperation of experts from BTC of Slovenia and University of Ljubljana, Faculty of Electrical Engineering.
- In 2005, a pilot application of TM1 system was developed as laboratory system for a range of 100 cases per year.
- A device for imaging laboratory gel cards (gelscope) was developed.
- By 2008, it was implemented in all CTs.



Teleconsultations between 2005–2008

Stage 1



Problems after the reorganisation of BTS

- The organisation of work at the remote CTDs became a responsibility of BTC of Slovenia and CTM Maribor.
- Clinicians from hospitals did not participate in the transfusion service any more (exception emergency cases).
- The *Competent authority* demanded equal service 24/365.
- 9 remoted locations = 9 transfusion medicine specialists needed 24/365, but only few were available.

TM system offered a solution to pretransfusion testing

TM1 system used for routine practice after reorganisation

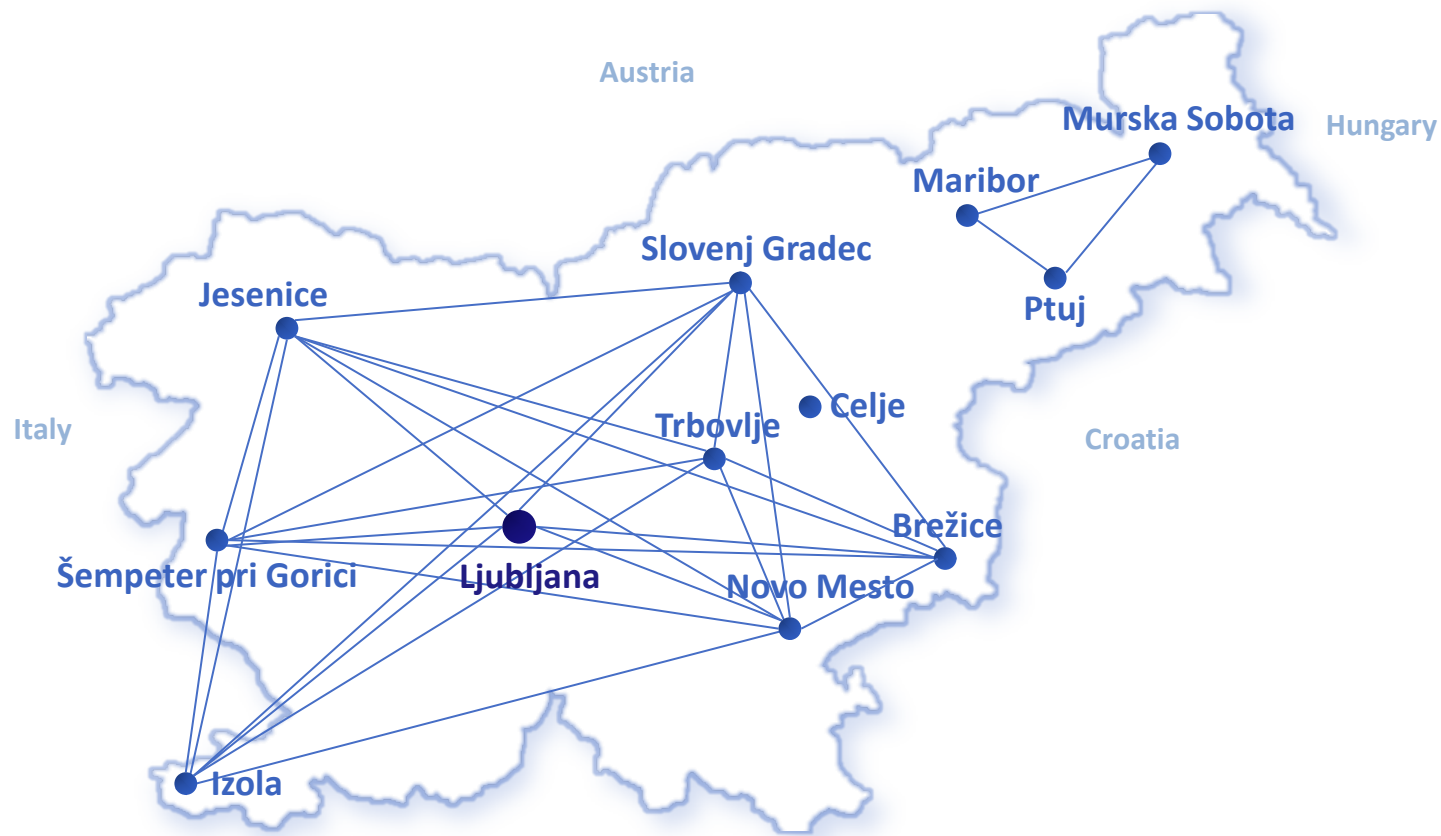
Stage 2

- After 2008, the purpose of TM1 system has been extended from consultation in special cases to routine pretransfusion testing in day time.
- The number of TM sessions increased substantially.
- Since 2009, its use has been extended until the evening.
- Since July 2011, two teleconsultants in Slovenia have been on duty 24/7/365.



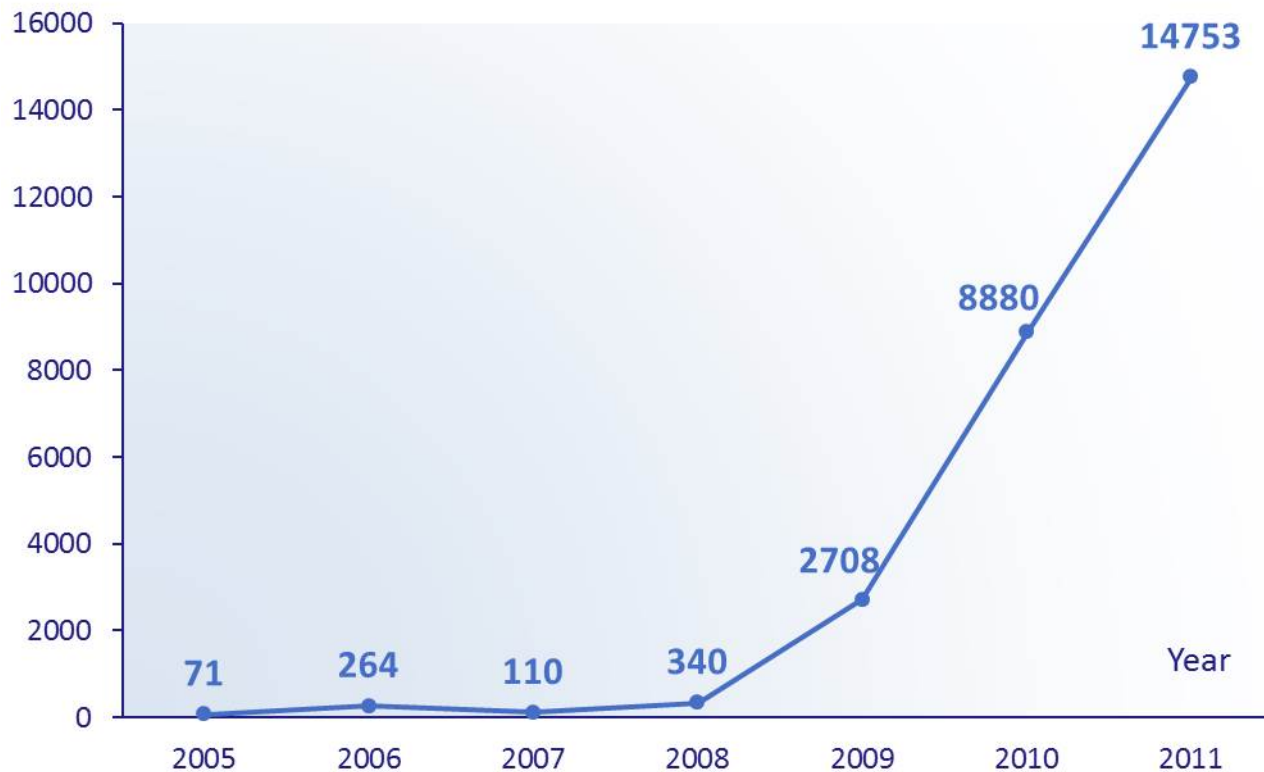
TM sessions after reorganisation of BTS

Stage 2



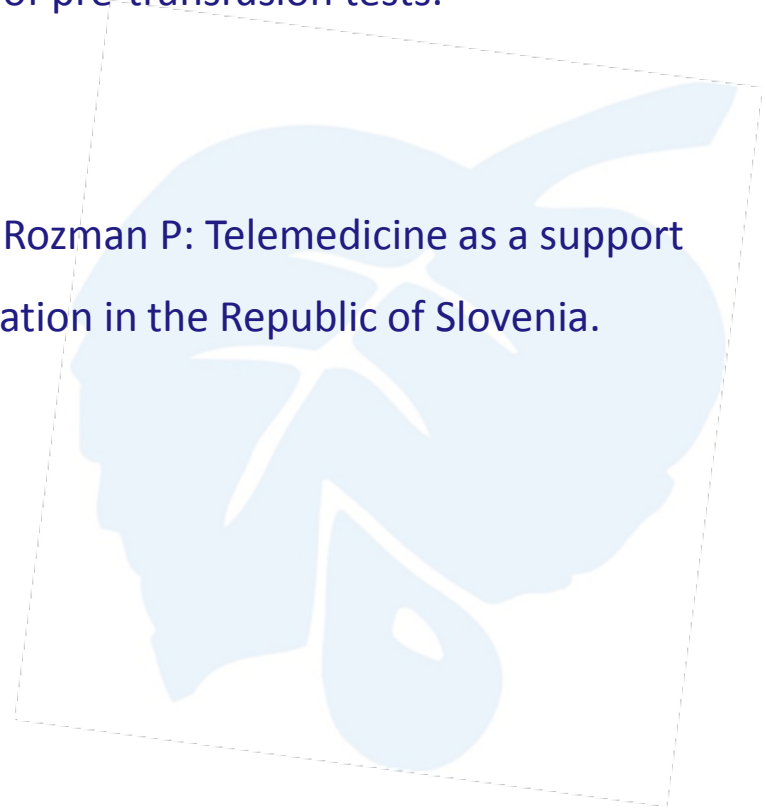
The frequency of TM sessions

Number of TM sessions



References for TM1

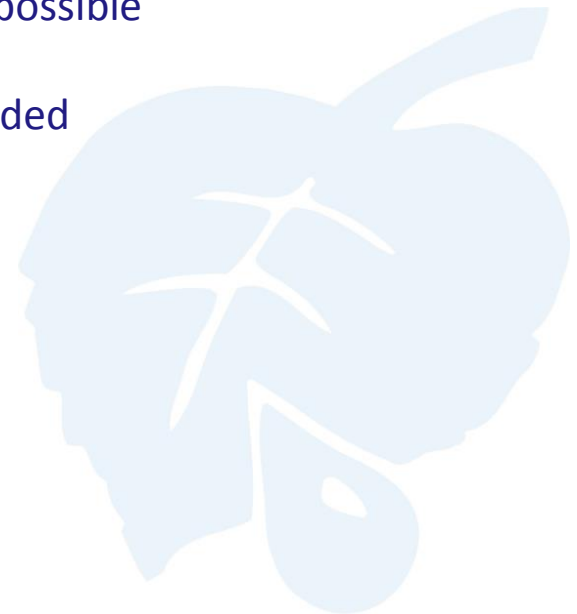
- Meza M, Breskvar M, Kosir A, Bricl I, Tasič JF, Rozman P: Telemedicine in the blood transfusion laboratory-remote interpretation of pre-transfusion tests.
J Telemed Telecare 2007; 13: 357-62.
- Bricl I, Breskvar M, Tasic JF, Meza M, Jeras M, Rozman P: Telemedicine as a support system to blood transfusion service reorganisation in the Republic of Slovenia.
Vox Sang 2010; 99: 126-7. **awarded poster**



Development of the new TM2 system

Reasons:

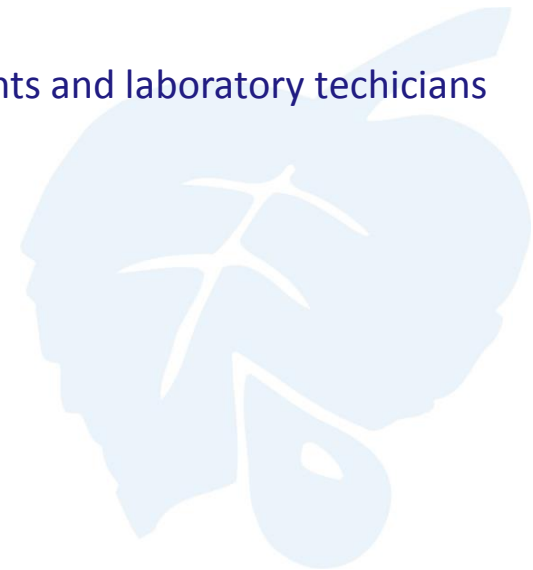
- TM1 system has not been designed for up to 20,000 cases a year
- Upgrade of existing (laboratory) platform was no longer possible
- A new professional TM system with redundancy was needed
- New professional requirements
- A need to increase safety



Development and implementation of the new TM2 system

Stage 3

- End of 2011 – Public tender for the development of new TM2 system
- Tender was awarded to the Slovenian IT company XLAB Ltd.
- During 2012, TM2 system was developed in cooperation with experts from BTC of Slovenia
- End of 2012 – testings, validation and training of consultants and laboratory technicians
- February 2013 – Launch of the TM2 system in all CTs
 - TM2 system has new professional functionalities
 - Maintenance & support 24/7
 - CE certification in process





Improvements in the new TM2 system

FUNCTIONALITIES	TM1	TM2
Checking of historic ABO	No	Yes
Types of sessions	Consultation	<ul style="list-style-type: none">• Datec session• Consultation• Quality control• Fotoarchive
Status of the session	<ul style="list-style-type: none">• Answered• Unanswered	<ul style="list-style-type: none">• In preparation• Received• In answering• Partially answered• Finished
State of urgency		<ul style="list-style-type: none">• Regular• Urgent
Attached request	No	Yes
Attached list of panel cells	No	Yes
Choosing among prepared results	Partially	Yes
Consecutive adding of tests within one session	No	Yes

Connection of TM system with host transfusion IS DATEC

DATA EXCHANGE (TM vs DATEC)	TM1	TM2
Import from host transfusion IS DATEC	<ul style="list-style-type: none">• Patient data• Patient AB0• Sample ID• Medical remarks• Laboratory results history• Issued units	<ul style="list-style-type: none">• Patient data• Patient AB0• Patient K• Orientation AB0• Sample ID• Medical remarks• Laboratory results history• Issued units• Comments
Export to host transfusion IS DATEC	No	<ul style="list-style-type: none">• Test results• Comments on report• Electronic signature
Communication protocol	Unsecure (ftp)	Secure (ssh)

Technician prepares the TM session



Inserting gel card into haemoscope



The session arrives to consultant

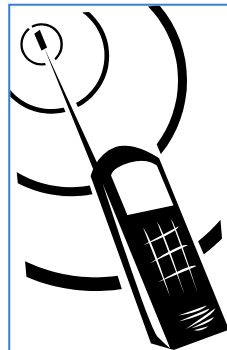
TM2 [2013100701] Pon, 28.10.2013 10:04 mag. Marjeta Maček...

TeleMedicina2

Moje nezaključene **4** Vse nezaključene **4** Moje zaključene **5+** Vse zaključene **5+** Arhiv vseh sej **Q** Napredno iskanje

STATUS	NUJNOST	ZAČETEK SEJE	ZAKLJUČEK SEJE	PRIM.	ROJSTNI DATUM	MED. OP.	ŠTEVLO MP	NAROČILNICA	TP SEJE	DATEC	LAB. BUŽENIR	LOKACIJA	KONZULTANT
V odgovorjanju	Nujno	Danes, 10:00	Danes, 10:01	M...	26.5.1985		1		DATEC seja	V delu	Pogač Dragica	CTD Slovenj Gradec	Janka Černe, dr.med.
Prejeta	Redno	Danes, 09:43	Danes, 09:46	P...	9.2.1980	GG	0		DATEC seja	V delu	Amir Bešić	CTD Jesenice	Janka Černe, dr.med.
Prejeta	Redno	Danes, 09:36	Danes, 09:40	Ko...			0		Kontrola kakovosti		Jasna Vošner	CTD Slovenj Gradec	Janka Černe, dr.med.
V odgovorjanju	Redno	24.10.2013	24.10.2013	Pl...	9.2.1995		0		Posvetovanje		Saša Intihar Trček	ZTM Ljubljana	prim. Irena Dncl, dr.med.

Število sej pogleda : 4 25 50 100 < 1 od 1 >



Request

Zavod Republike Slovenije za transfuzijsko medicino
 Štajmerjeva ulica 6, 1000 Ljubljana, Slovenija
 Tel.: +386 (0)1 543-81-00, Fax: +386 (0)1 230-22-24
 E-pošta: central@ztm.si, www.ztm.si

Številka naročilnice: **0425314**

Naročilnica za krvne pripravke

Podatki o naročniku:
 Klinika: **CIT-KRG**
 Interni telefon: **31-81**
 Kontaktna oseba: **DR. PETRIKAR**
 Zdravnik naročnik: **DR. PRIKAR P.**
 Datum naročila: **15.12.11 ob 20³⁰**
 Ura naročila: **15.12.11 ob 20³⁰**

Podatki o bolniku/ci:
 14591772 175656678
 03.12.2011
 17.04.1952
 0093282 I, II, III, IV
 040037
 4240 RADOVLJICA
 ČI 11 00537 66 05 5/11

Vzorce bolnikove krvi obvezno označite s priloženimi črtnimi kodami! Glej navodilo za odvzem vzorcev krvi na hrbtni strani naročilnice.

Naročamo

1. Komponente krvi:
☐ Eritrociti
☒ Eritrociti, odstranjeni levkociti **2X** enot
 Dodatna obdelava:
☐ obsevani
☐ CMV negativni
☐ v AB plazmi
☐ drugo:
☐ Trombociti, zlitje enot
☐ Trombociti, afereza enot
☐ Granulociti, afereza enot
☐ Sveža zmrznjena plazma mL
☐ Sveža zmrznjena plazma, odstranjen krioprecipitat mL
☐ Drugo:

2. Zdravila iz krvi: Št. enot / volumen (mL):
☐ Albumini
☐ Gamaglobulini
☐ Drugo:

3. Stopnja nujnosti izdaje:
☐ Izjemno nujna
☐ Zelo nujna (I. faza po telefonu)
☒ Nujna (I. faza)
☐ Ni nujna (redna)
☐ Rezervirano do:

4. Predtransfuzijsko testiranje:
☒ Navzkrižni preizkus
☐ Določitev krvne skupine AB0, RhD in K
☐ Indirektni antiglobulinski (Coombsov) test (ICT)
☐ Direktni antiglobulinski (Coombsov) test (DCT)
☐ Drugo:

Podatki o bolniku/ci

5. Klinična diagnoza:
Polektomija / Sepse

6. Terapija: Nujno po MS, Kivamin, Solvent, Aclase, Kivamin, Aclase, Midazolam, Propofol, Contasep, Furosemid, En tromboliti, Bifidus, Klavulan, Tetracylin

7. Transfuzijska anamneza:
 Že prejel(a) transfuzijo
☒ Da - Kdaj zadnjikrat: **6.12.11** ☐ Ne
 Neželeni učinki transfuzije krvi
☐ Da ☐ Ni podatka ☐ Ne
 Opis:

8. Nosečnosti:
☐ Da - Leto zadnje nosečnosti: ☐ Ne

9. Določitev krvne skupine na ploščici pri odvzemu vzorca ali številka izvida in rezultat KS AB0:
☒ A ☐ B ☐ AB
 Krvno skupino določil: **DR. PRIKAR P.**
ZTK: 21216073, 03.12.11, 10.00.11, 10.00.11
 Podpis in žig zdravnika (obvezno): **(PRIKAR P.)**

UNIVERZITETNI KLINIČNI CENTER LJUBLJANA
 Kirurška klinika
 Klinični oddelek za anesteziologijo in intenzivno terapijo operativnih strok
 ODDELEK ZA INTENZIVNO TERAPIJO
 Ljubljana, Zaloška cesta 7 2

Sprejem naročila na ZTM Sprejem v laboratoriju
 Zap. št.: **83** Sprejel: **13**
 Datum: **15.12.11** Datum/ura: **21.11**

Orientacijska določitev krvne skupine v laboratoriju:

Ob odvzemu na vzorec obvezno nalepite črtno kodo!

B124165130A

TM session

TM2 [2013100701]

TeleMedicina2 **ANTONIJA** Vazrec št. B126607770A Pon, 28.10.2013 10:14 Nazaj na seznam

Informacije o pacientu

Datum rojstva: **21.5.1929**
Krvna skupina: **O-POZ**
Ag K: **K-**
Medicinska opomba:
Orientacijska KS: ?

Pregled zgodovine

Naročene storitve (St. naloga: 49584)

Redno

ICT KS NP
AK
NP: 2198331 (O-POZ, K-)

V odgovorjanju

Vpogled v naročila

1. II. III.

ANTONIJA

ANTONIJA
2198331

ICT: NEGATIVEN

Paketni list: 45184661 - 18.11.2013

Pogovorno okno

Napiši oporočilo

Vnesi

Zanemaj dodatek

Pošlji sejo

0-POZ

A-POZ

B-POZ

AB-POZ

O-NEG

A-NEG

B-NEG

Patient history

Zgodovina pacienta:

roj. 16.5.1935



Zdravniški komentarji

KOMENTAR

... KONEC KOMENTARJEV.

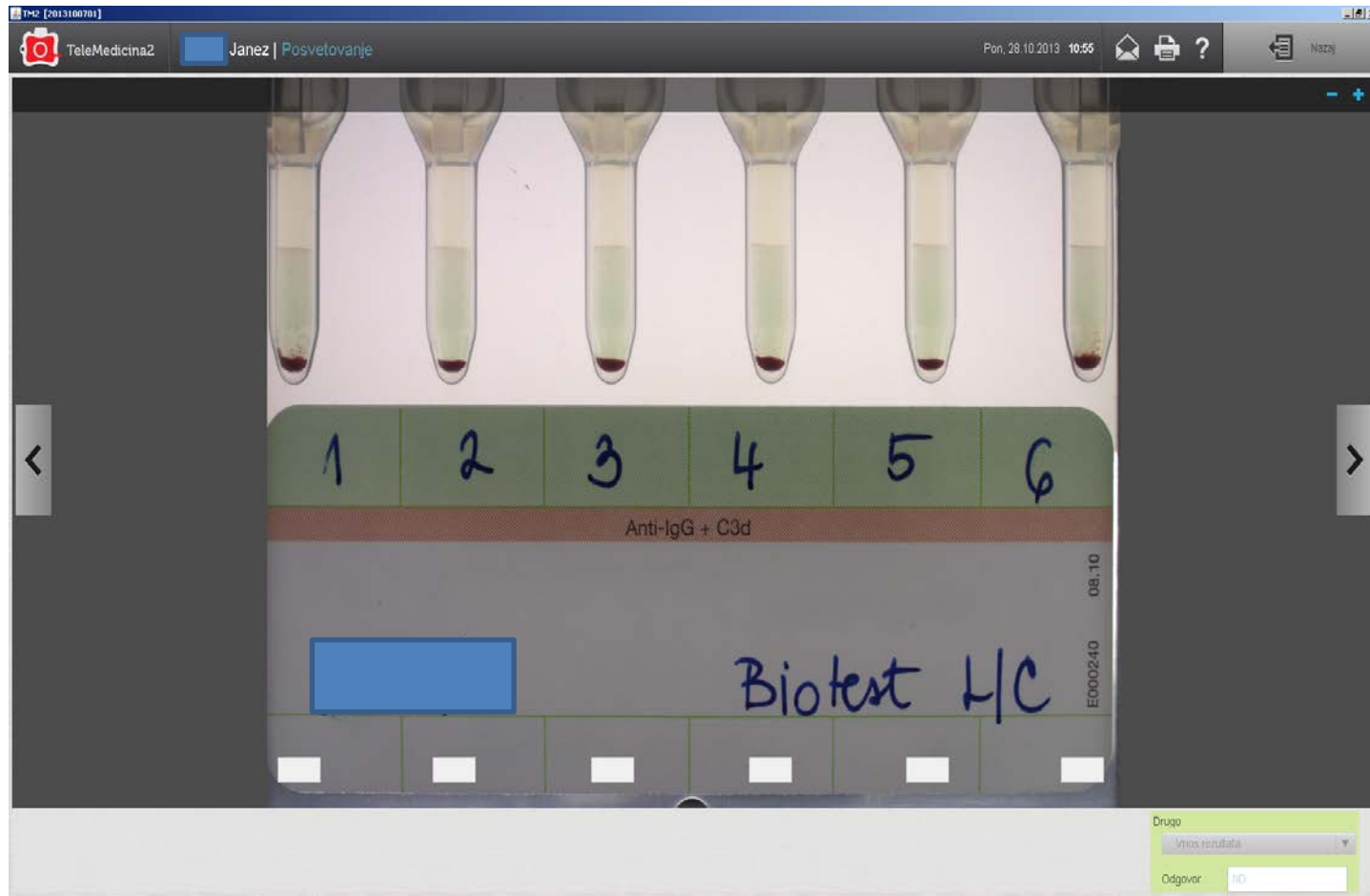
Zgodovina pacienta

DATUM IN URA	STATUS	IZVID	ZDRAVNIK	KLINIKA	ŠIFRA	LABORATORJSKI REZULTAT
19/10/2013 12:00	IZV	D5005156	TKTM	JEINTODD	23042	NAVZKRIŽNI PREIZKUS, GEL-NUJNO: NEG. z encimom NEG. s Coombsovim testom
19/10/2013 12:00	IZV	D5005156	TKTM	JEINTODD	20042	KRVNA SKUPINA, NUJNO: A, RhD POZITIVNA
19/10/2013 12:00	GRA	D0000000	TKTM	JEINTODD	21592	AVTOKONTROLA, GEL NUJNO: NT
19/10/2013 12:00	IZV	D5005157	TKTM	JEINTODD	21550	INDIREKTNI COOMBSOV TEST, GEL: NEGATIVEN
19/09/2013 11:48	OBR	Z5023501	TKAH	JEINTODD	23040	NAVZKRIŽNI PREIZKUS, GEL TEST: NEG. z encimom NEG. s Coombsovim testom
Izvid nadomešča izvid št.:Z5023491 (popravljeni matični podatki)						
19/09/2013 10:53	OBR	Z5023499	TKAH	JEINTODD	20001	KRVNA SKUPINA, GEL: A, RhD POZITIVNA
19/09/2013 11:48	OBR	Z5023501	TKAH	JEINTODD	20040	KRVNA SKUPINA, GEL: A, RhD POZITIVNA
Izvid nadomešča izvid št.:Z5023491 (popravljeni matični podatki)						
19/09/2013 11:48	OBR	Z5023501	TKAH	JEINTODD	21591	AVTOKONTROLA, GEL: POZITIVNA
Izvid nadomešča izvid št.:Z5023491 (popravljeni matični podatki)						
19/09/2013 10:53	OBR	Z5023499	TKAH	JEINTODD	21012	ERITROCITNI ANTIGENI KELL: K-
19/09/2013 10:53	OBR	Z5023500	TKAH	JEINTODD	21535	DIREKTNI COOMBSOV TEST, GEL: anti-IgG pozitiven
19/09/2013 10:53	OBR	Z5023500	TKAH	JEINTODD	21535	DIREKTNI COOMBSOV TEST, GEL: anti-IgA negativen
19/09/2013 10:53	OBR	Z5023500	TKAH	JEINTODD	21535	DIREKTNI COOMBSOV TEST, GEL: anti-IgM negativen
19/09/2013 10:53	OBR	Z5023500	TKAH	JEINTODD	21535	DIREKTNI COOMBSOV TEST, GEL: anti-C3c negativen
19/09/2013 10:53	OBR	Z5023500	TKAH	JEINTODD	21535	DIREKTNI COOMBSOV TEST, GEL: anti-C3d negativen
19/09/2013 11:52	OBR	Z5023502	TKAH	JEINTODD	21530	DIREKTNI COOMBSOV TEST, GEL: POZITIVEN
19/09/2013 11:53	OBR	Z5023503	TKAH	JEINTODD	21550	INDIREKTNI COOMBSOV TEST, GEL: NEGATIVEN
03/10/2013 10:40	OBR	Z5023651	TKMT	JEINTODD	23040	NAVZKRIŽNI PREIZKUS, GEL TEST: NEG. z encimom NEG. s Coombsovim testom
03/10/2013 10:40	OBR	Z5023651	TKMT	JEINTODD	20040	KRVNA SKUPINA, GEL: A, RhD POZITIVNA
03/10/2013 10:40	OBR	Z5023651	TKMT	JEINTODD	21591	AVTOKONTROLA, GEL: POZITIVNA
03/10/2013 10:40	OBR	Z5023652	TKMT	JEINTODD	21550	INDIREKTNI COOMBSOV TEST, GEL: NEGATIVEN

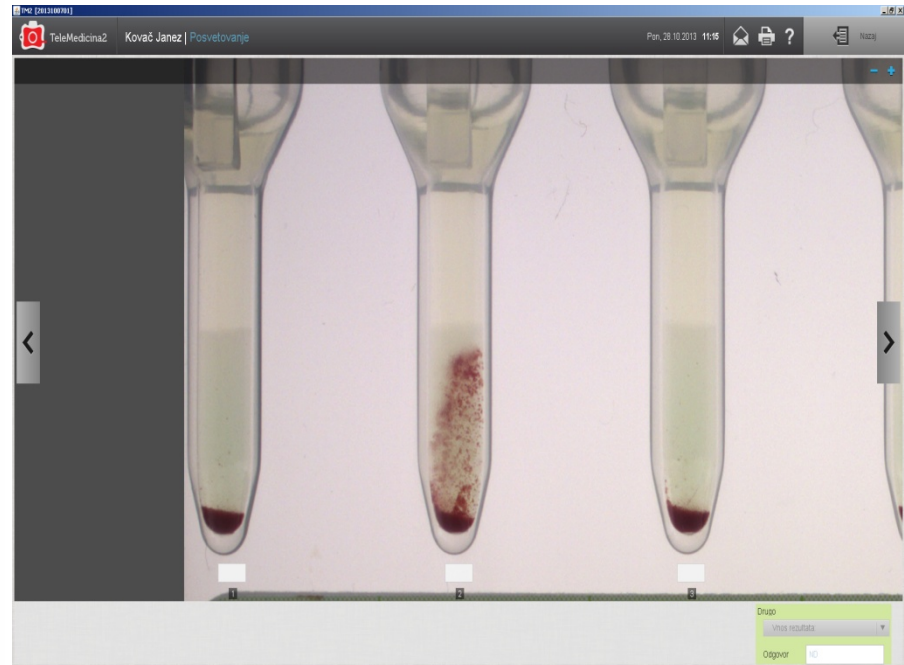
Anamneza za pacienta

DATUM IZDAJE	IME	ŠT.KRVI	VOL	AB0RhD	IZVID	KLINIKA	NAROČILNICA
19/09/2013	KEF	2222744	305	A-POZ	5023501	JEINTODD	12775
19/09/2013	KEF	2228574	300	A-POZ	5023501	JEINTODD	12775
03/10/2013	KEF	2231102	260	A-POZ	5023651	JEINTODD	12826
19/10/2013	KEF	2227117	280	A-POZ	5005156	JEINTODD	12893

Enlarged image of gel card



Enlarged image of columns



Screening cells

TM2 [2013100701] TeleMedicina2 Panelni list | 45184661 - 18.11.2013 Pon, 28.10.2013 10:17 Nazaj

BIO-RAD ID-DiaCell I-II-III ID-DiaCell IP-IIP-IIIIP

Antikörper-Suchtest / Antibody screening / Recherche d'anticorps / Screening anticorpale / Escrutinio de anticuerpos irregulares / Teste pesquisa de anticorpos

Antigen-Table / Antigen-Table / Table d'antigènes / Tabella antigenica / Tabla de antígenos / Tabla de antígenos

Rh-ir	Spender Donor Donateur Donante Dador	Rh-ir	Kell		Duffy	Kidd	Lewis	P	MNS	Luth	Xg	Spec. Antigene Special types Antigènes part. Antígenos partic. Otros Antígenos Tipos especiales	Resultat / Result / Resultat / Resultado / Resultado																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
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Lot: I 06084.66.x, II 06094.66.x, III 06104.66.x

Set I-II-III 45184.66.x, Set IP-IIP-IIIIP 45194.66.x

2013.11.18

V.I.P. Software: S320

Anmerkungen siehe rückseitig / Remarks see overleaf / Voir les remarques au verso / Per le note consultare il retro / Ver observações en el reverso / Ver observações no verso

Name / Name / Nom / Nome / Nombre / Nome	Blood group + Antigene / Blood group + antigens / Groupe sanguin + antigènes / Gruppo sanguigno + antigeni / Grupo sanguíneo + antígenos / Grupo sanguíneo + antígenos	Interpretation / Interpretation / Interpretation / Interpretazione / Interpretación / Interpretación	Datum / Date / Date / Data / Fecha / Data

8004311 04.13 02.08.2013 / 13.18 DiaMed GmbH, Fra Rond 23, 1705 Cressier FR, Switzerland, www.bio-rad.com/inmunohematology

Electronic signature

JasperViewer

100%

Tip preiskave NP 2231239 (0-POZ, K-)

Odgovor ne izdati

mag. Marjeta Maček Kvanka, dr.med.
20.10.2013 ob 16:12

Komentarji:

mag. Marjeta Maček Kvanka, dr.med. [20.10.2013 ob 17:24]
V plazmi so prisotna eritrocitna protitelesa nerazvidne specifičnosti, najverjetneje avtoprotitelesa. Priporočamo nadaljnje testiranje na ZTM.

mag. Marjeta Maček Kvanka, dr.med. [21.10.2013 ob 06:50]
Pozitivni navzkrižni preizkusi z encimom so posledica nespecifične encimske motnje. Enote so skladne v fenotipu Rh in K.

E-Podpis:

Telekonzultant:
mag. Marjeta Maček Kvanka, dr.med.

Datum:
21.10.2013 ob 06:50

Izvleček iz e-podpisa:
SvIUAYLjyRBIzDwz+dUYa88FStGxRQjDhPpn7Uly+o0aG05ldkyttqloZfMeK2tjUDQap3tEveLEOpXTqJN5ldBm5Zc2jRjYjMx+xzoy9U9V+SrPeEkZ/692weyXAXI7Q9LuW2BSok+rU1udnY4EQeF4j3j5ufp10ukjP5g==

Stran 6 / 6

IZVID št.: Z6330215 izd.22/10/2013 17:05
Štev. naročila: 174614 spr.22/10/2013 14:31

KRVNA SKUPINA, NUJNO: A, RhD POZITIVNA

AVTOKONTROLA, GEL NUJNO: NEGATIVNA

NAVZKRIŽNI PREIZKUS, GEL TEST - NUJNO:
NEG. z encimom NEG. s Coombsovim testom

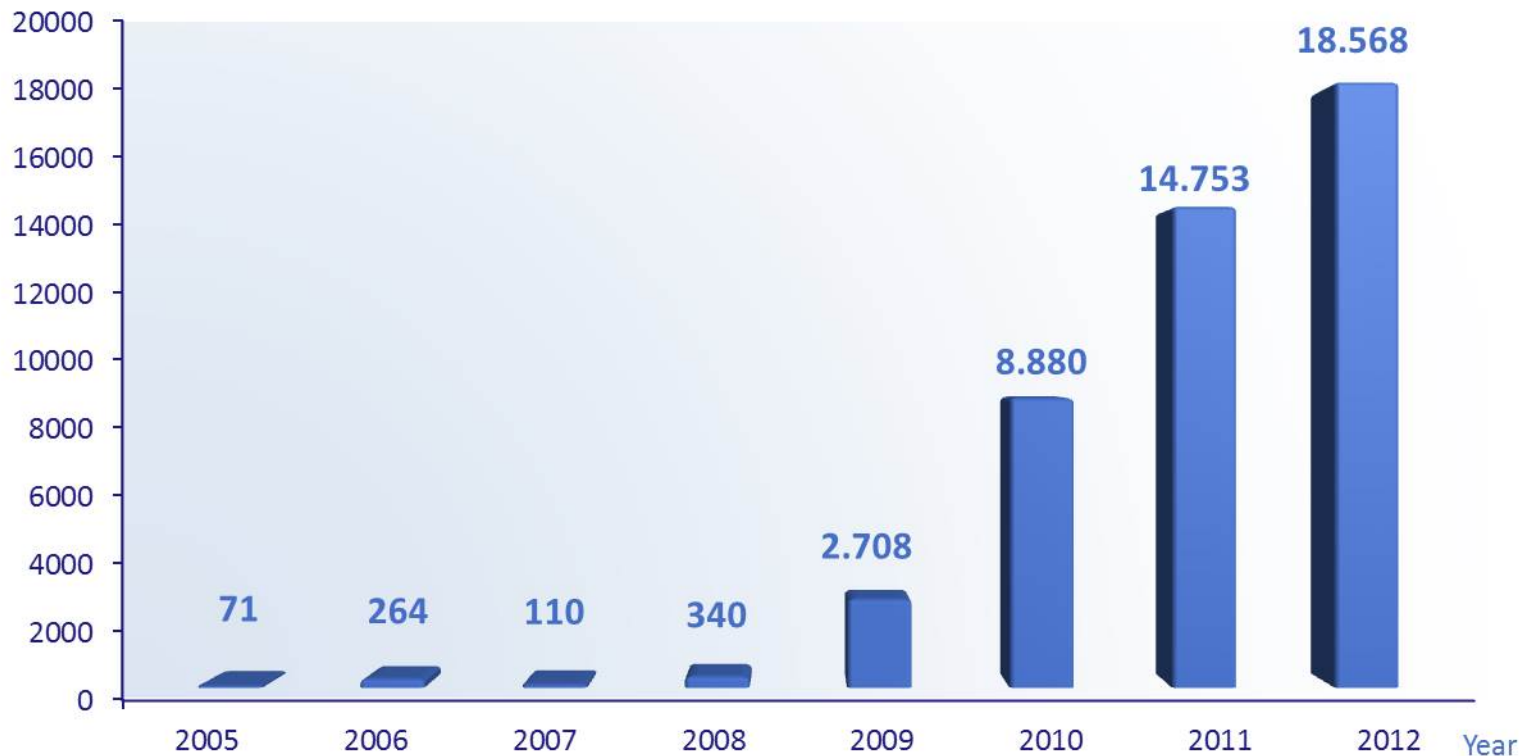
ŠT.KRVI ABO-RH ŠT.KRVI ABO-RH ŠT.KRVI ABO-RH
2207602 A-POZ

Izvajalec: Andreja Cesar, dipl.inž.lab.bi
Odg.zdr: Janka Černe, dr.med., spec.transf.med
rX9+UfLZ4QfS+W/CY3x9Cw== Id:80132 Seja:18965

Electronic signature (hash extraction)

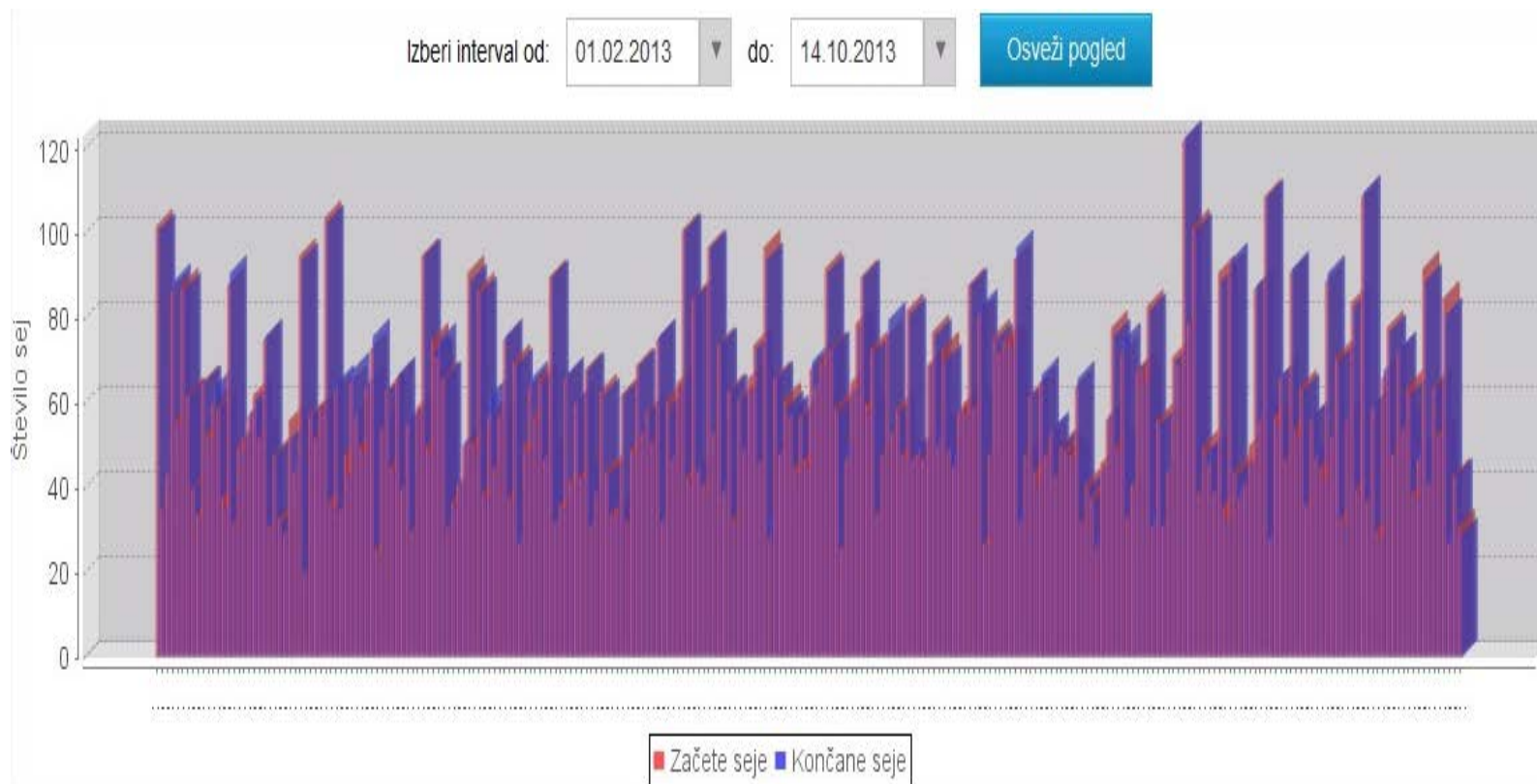
Statistics of TM sessions between 2005-2012

Number of TM sessions



Prediction for 2013: 18,520 [2-10: 13,890]

Statistics of TM2 sessions in 2013

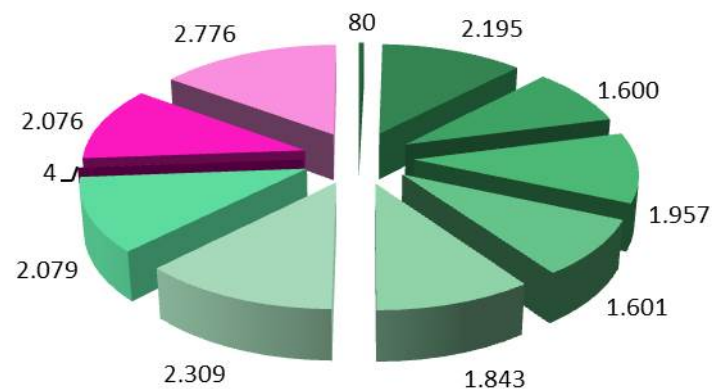


Peaks: 1833/month, 123/day

TM2 sessions in 2013

LOCATION	TM2 seassions 2-10 2013	Prediction Year 2013
BTC of Slovenia	60	80
CTS Novo mesto	1.646	2.195
CTS Trbovlje	1.200	1.600
CTS Slovenj Gradec	1.468	1.957
CTS Izola	1.201	1.601
CTS Jesenice	1.382	1.843
CTS Nova Gorica	1.732	2.309
BB Brežice	1.559	2.079
CTM Maribor	3	4
CTS Ptuj	1.557	2.076
CTS Murska Sobota	2.082	2.776
CTM Celje	0	0
SLOVENIA	13.890	18.520

Prediction Year 2013 : 18.520



Benefits of the new TM2 system

- The TM consultant has access to all available patient data
- IT controls built in the TM2 system improve the safety (checking of historic BG...)
- Electronic export of results from TM2 system to transfusion IS Datec reduces errors
- Redundance and traceability are provided
- The process is faster because less work is needed
- User-friendly for technicians and consultants



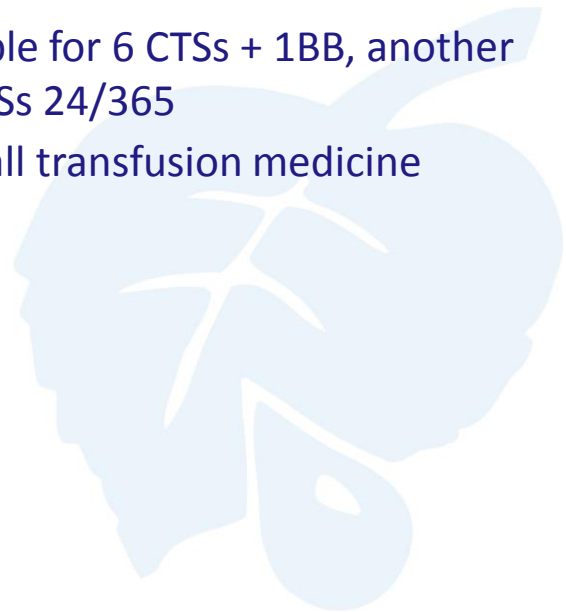
Impact of TM on BTS in Slovenia

- Equal quality / interpretation of the IH results
 - Due to the TM system, pretransfusion testing in Slovenia is supervised 24/365 by transfusion medicine specialists only (previously partial coverage)
- Lower costs
 - Reduction in the number of transfusion medicine specialists in CTDs:
 - In 2000: 13 full time + 1 part time job
 - In 2013 : 5 full time + 4 part time job
 - Allocation of some transfusion medicine specialists to the BTC of Slovenia and CTM Maribor



Impact of TM on BTS in Slovenia

- Quicker responding time in complex cases
 - More cases are solved on site
 - Laboratories are equipped with panel cells and reagents
 - Fewer samples are transported to the Reference laboratory
- Rationalisation of activities
 - One consultant in the Ljubljana region is responsible for 6 CTSs + 1BB, another one in the Maribor region for CTM Maribor + 2 CTSs 24/365
 - Since the consultant can work from any location, all transfusion medicine specialists can be engaged



Impact of TM on BTS in Slovenia

- Standardisation of testing procedures
 - The use of the TM system required the standardisation of testing procedures
- So far, the TM system has been the only transfusion IS that connects all CTs in one TM region
 - It enables the checking of patients' data from other CTs



Conclusions

- TM enables remote interpretation of pretransfusion testing
- TM provides the same quality / interpretation of pretransfusion testing in all BTS sites
- TM helped in the reorganisation of national BTS
- TM is the key element of BTS in Slovenia today
- TM enables further rationalisation in the organisation of national BTS



Thanks to

Prim. Irena Bricl, MD



Invitation

Telemedicine system TM2 will be presented by our partner XLAB at

MEDICA 2013

World Forum for Medicine

International Trade Fair
November 20-23, 2013
Düsseldorf, Germany