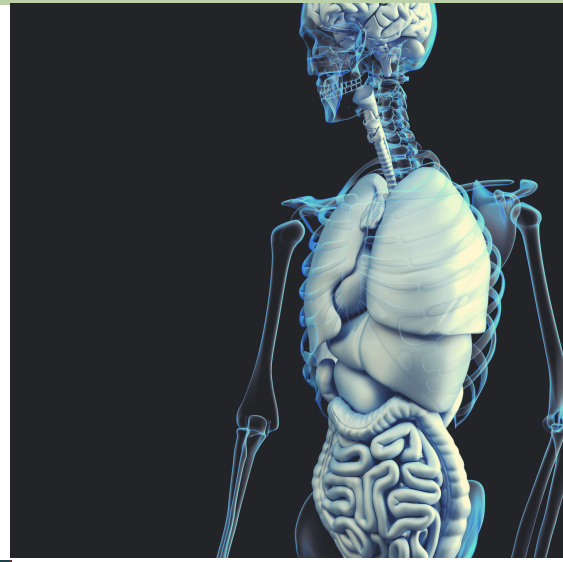




NATIONAL TRANSPLANT & PROCUREMENT SYSTEM



Artman
Technologies s.r.o.

ARTMAN TECHNOLOGIES

Established in 1991.

Artman Technologies s.r.o. is a pioneer in the field of healthcare information management systems.

For over 25 years it has developed and enhanced ehealth solutions in the areas of organ transplantation and donation, national healthcare registries, and bespoke healthcare institutional management systems.

Artman Technologies develops healthcare National Information Systems in close co-operation with experts from organ procurement organisations, transplant centres, tissue and cells banks, research banks, HLA labs, donor hospitals, follow up centres, universities, ministries of health and special healthcare authorities.

Over 571 implementations of various solutions have been completed, including the first web-based National Transplant Database and System for the United Kingdom and Ireland since the year 2000.



"The fastest Matching Run I have seen so far! Impressive performance."*



29

Countries



168

Trusts



1596

Hospitals



3945

Tissue Establishments



813

Transplant Units



44

HLA Labs

*Sue Falvey - Duty Office Manager, Blood and Transplant NHS, UKT.

APPLICATION MODULES

Transplant, Procurement & Dialysis

Database application is fully functional and currently running online for national healthcare sectors.



Transplant Module

New recipients are registered into the National Waiting List and the Follow Up is provided post transplantation. The module also manages organ offers from Matching Algorithms and allows rejections and re-registrations.



Donation Module

All potential donor cases are logged and once confirmed, they are registered as active donors in the donation database. This includes multi organ, live and cadaveric donors. The Matching Run algorithm allocates and offers the organ(s) of the donor to recipients on the National Waiting List. Direct offers are also possible.



Follow Up Module

The application system generates auto notifications for recipients needing follow up, for example 3 months and 1 year after transplantation. The module allows for transfers to different Follow Up centers and re-registrations to Waiting List after rejection. Live donors Follow Up is also available.



Dialysis Module

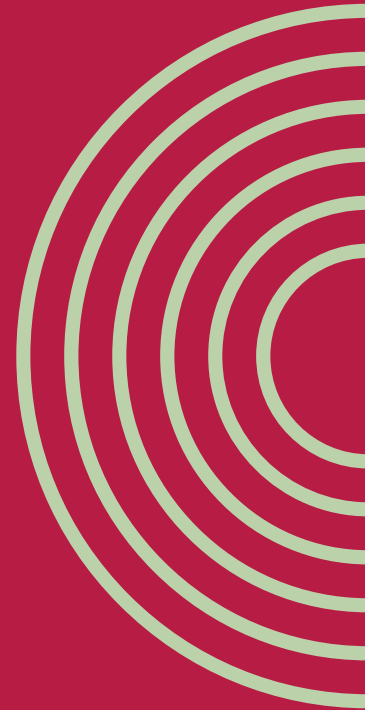
New patients are added to the Dialysis List and can be directly transferred to a National Renal Waiting List for transplantation. The patient's laboratory data and status history are collected and transferable. The option to activate patients back on Dialysis after rejection is also available.



Tissue & Cell Module (Expansion Pack)

Alongside organs, the application includes tissue and cell donation and transplantation. The retrieval, processing and storage in Banks Labs is all logged into the database, where links to the recipient can be then found. The system traces back in case of adverse reactions and events.

EVERY LIFE MATTERS.



The National Transplant Procurement and Information System is currently capable of processing, procuring and transplanting 8 main organs, 84 different tissue types and 4634 tissue products.



ORGAN TYPES

KIDNEY

HEART

PANCREAS

LUNG

LIVER

BOWEL

CORNEA

Expansion Module

The application also supports Tissue and Cell transplantation. The system is streamlined and automated to the user requirements. For more information, please see the **Tissue Management System Brochure**.



FORMS

Data inputting forms are available in each stage of the application system.

Profile

Profile Form - available at the beginning of every module. Logs the basic patient information and demographics.

Donation

Core Donor Data Form
Renal Donor Information Form
Heart/Lung Donor Information Form
Liver Donor Information Form
Cornea Donor Information Form

Recipient

Before Transplantation:

Recipient Registration Form
Abdominal Investigation Results Form

After Transplantation:

Renal Transplant Record Form
Heart/Lung Transplant Record Form
Liver Transplant Record Form
Cornea Transplant Record Form

Laboratory Data

Serology Form Entry
Haematology Form Entry
Biochemistry Form Entry
Blood Gases Form Entry
Hemodynamics Form Entry
Echo Test Form Entry
Urine Output Form Entry
Monitoring Data Form Entry
Sensitisation Form Entry
Urea & Electrolytes Entry Form
HLA Form

Follow Up

Follow Up Form - available for all organ types.

Dialysis

Core Dialysis Form
Form Process Guide for Dialysis
Hemodialysis Form
Peritoneal Dialysis Form
Dialysis Medications and Treatment
Dialysis Performance

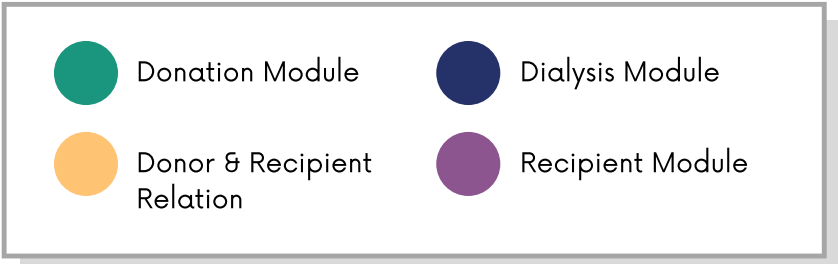
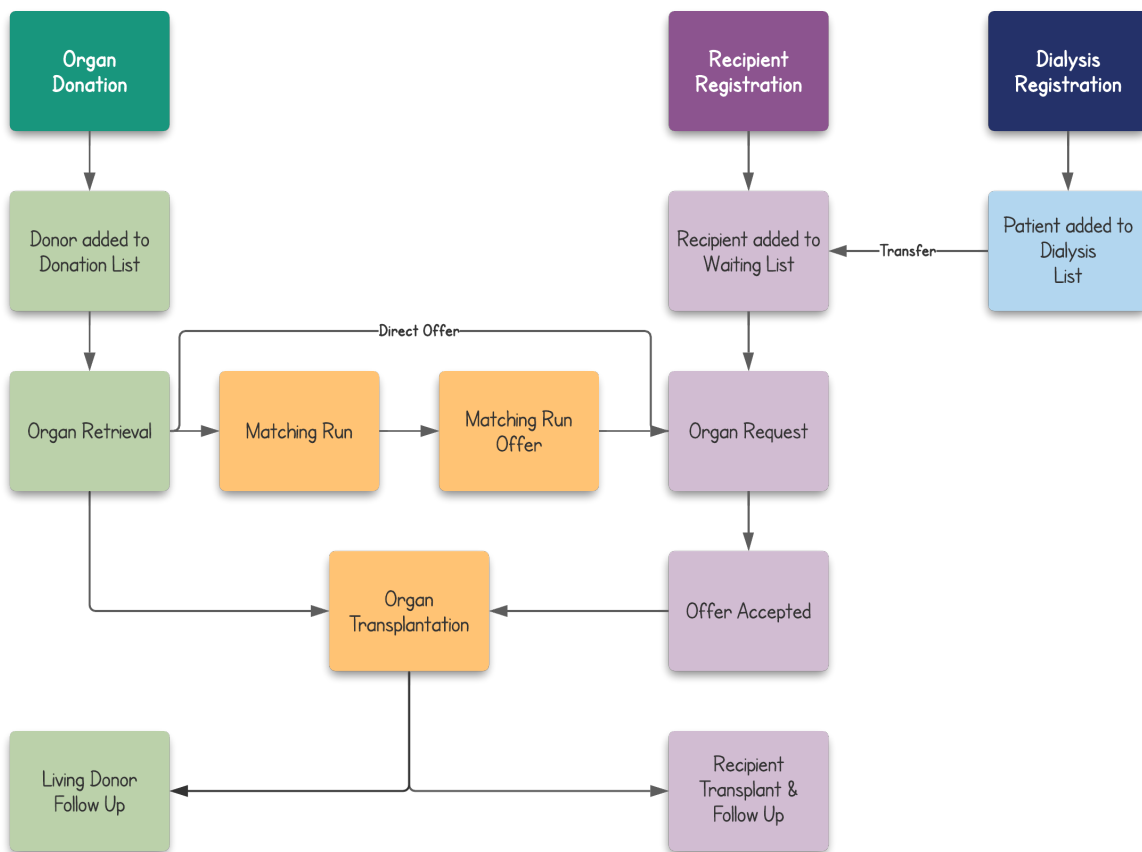


TRANSPLANT PROCESS



Donation, Transplantation & Dialysis

The application process flowchart displays the relationships between donors, recipients and dialysis patients.





Benefits & Advancements

Increased rate of transplants saves lives.

Matching Run

Integrated software matching recipients and donors fairly and quickly. Customised criteria applied in Matching Run for each organ. For example the HLA, blood type, urgency and age data is collected and the algorithm generates a priority list of recipients for transplant. This increases donor/recipient compatibility and decreases the amount of rejected organs.

National Statistics

Data from forms and processes can be extracted and national statistics can be generated. The user can manipulate and transform the data as needed, for example into tables, charts and graphs. This provides clean and validated information, helping researchers with relevant clinical studies.

Patient Benefits

The national system increases fairness of organ distribution and availability around the country. The possibility of losing organs due to a low pool of local compatible recipients is reduced. Additionally, the national Follow Up system has automated notifications and monitoring, which increases the quality of life for grafted patients.

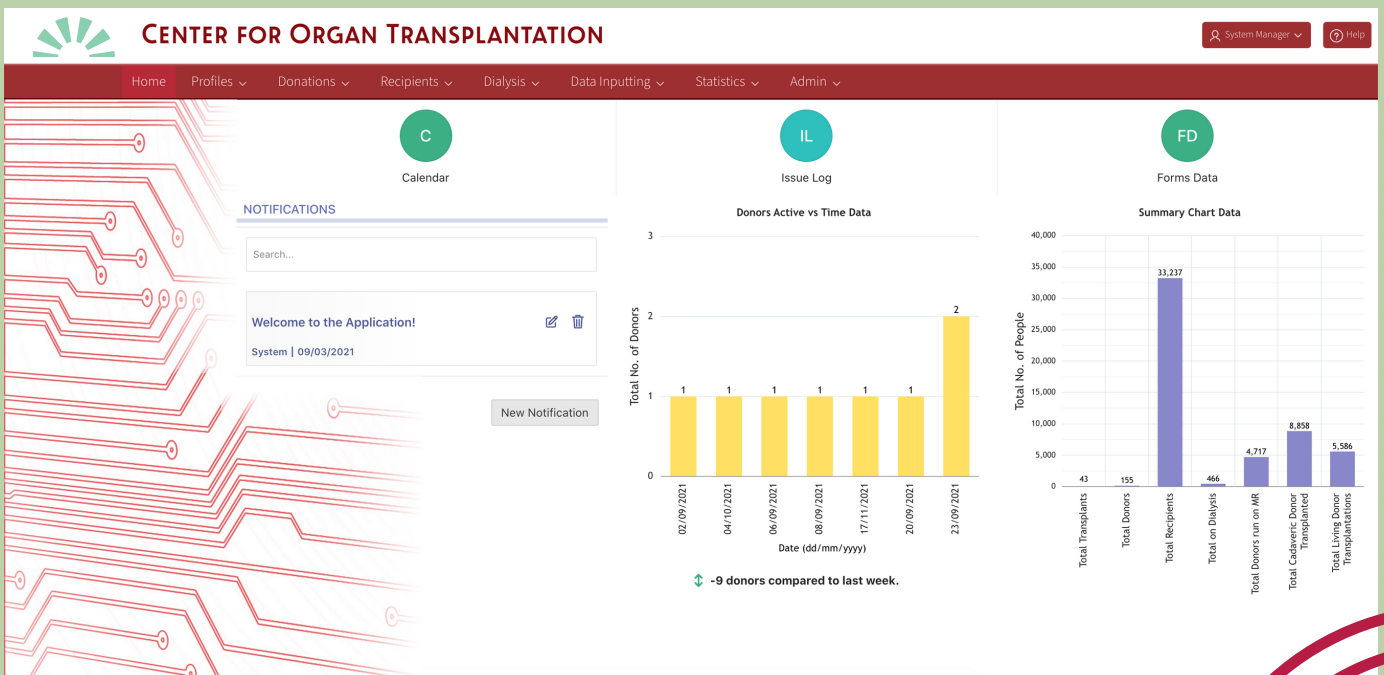
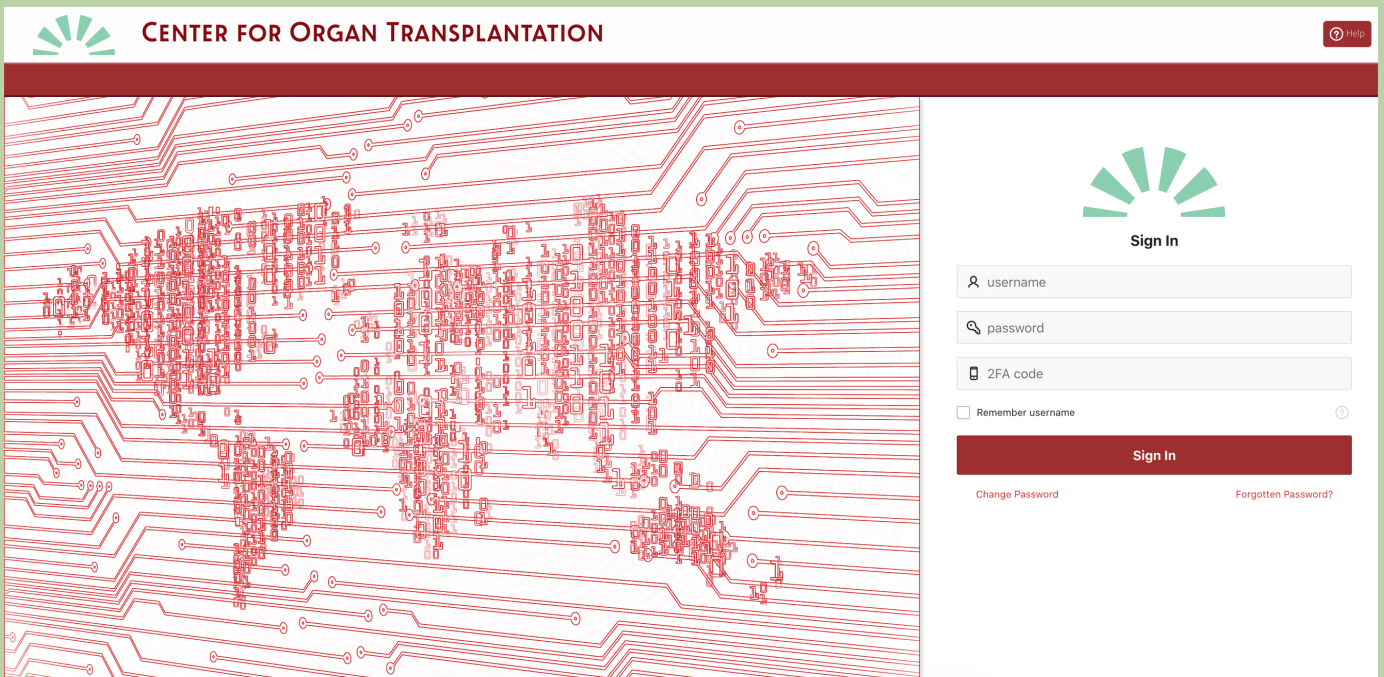
Ecosystem Benefits

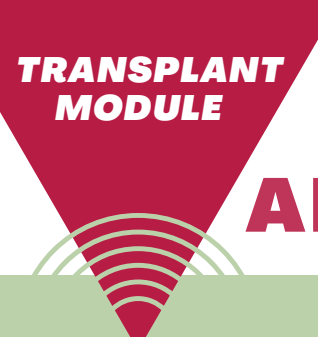
Procurement efficacy is increased, as Organ Procurement Organisations (OPOs) decrease the overall budget in comparison to local transplant activities. Validation processes reduce human errors and paperwork; increasing speed and efficiency.

APPLICATION FORMAT

Example images of application login page and homepage.

The application pages and system are custom designed to user requests.





APPLICATION FORMAT

Example images of application Waiting List, Profile Form and Recipient Registration.

The Waiting List can be customised and filtered. Users can adjust, delete or add columns.

Person ID	Recip id	Requested Organs	Reg Date	Name	National ID	Birth Date	Blood Group	Hospital Name	Epts
210244	100649	LEFT KIDNEY-TX CADAV	18/11/2021	testFUPCalcRCP testFUPCalcRCP	134615834541	18/11/2000	O POS	Hospital 1	.13
210203	100648	RIGHT KIDNEY-TX CADAV	18/11/2021	recipient test	678578237234	04/11/1981	A POS	Hospital 3	.84
210202	100647	UNSPECIFIED KIDNEY-URGENT	17/11/2021	SurDemoRecipTest1711 DemoRecipTest1711	21234543343	16/11/1946	A POS	Hospital 2	2.35
210190	100646	UNSPECIFIED KIDNEY-ACTIVE	17/11/2021	test234	1017463694	21/10/1941	B NEG	Hospital 1	2.59
210188	100645	UNSPECIFIED KIDNEY-ACTIVE	17/11/2021	Dlalytest11	678546756756	01/11/1972	A POS	Hospital 6	1.14
210187	100644	UNSPECIFIED KIDNEY-ACTIVE LEFT KIDNEY-ACTIVE	17/11/2021	testUnspecDia testUnspecDia	453737373737	17/11/2000	O POS	Hospital 1	0
210182	100641	UNSPECIFIED KIDNEY-TX CADAV	17/11/2021	SurDemoTest16114 DemoTest16114	212439035	08/11/2002	A POS	Hospital 8	0
210122	100639	UNSPECIFIED KIDNEY-TX CADAV	17/11/2021	SurDemoTest1611 DemoTest1611	2124338594	07/11/1974	A POS	Hospital 2	1.04
210102	100638	UNSPECIFIED KIDNEY-TX CADAV	16/11/2021	testScenariosSBJ testScenariosSBJ	134513435	16/11/2000	O POS	Hospital 2	0
210083	100637	LEFT KIDNEY-TX CADAV	16/11/2021	testDonorDataRCP testDonorDataRCP	163431051332	16/11/2000	O POS	Hospital 6	.13
210003	100636	UNSPECIFIED KIDNEY-URGENT WHOLE LIVER-ACTIVE PANCREAS-ACTIVE	15/11/2021	SurDemoTest15112 DemoTest15112	2124839748	02/11/1990	A POS	Hospital 7	.28
210023	100635	LEFT KIDNEY-ACTIVE	15/11/2021	testPresentationKidneyRCP testPresentationKidneyRCP	21634416543	15/11/2000	O POS	Al Amir H Kuwait	.13

Person ID	Recipient ID	National ID	Name	Birth Date	BG	Gender
210202	100647	21234543343	SurDemoRecipTest1711 DemoRecipTest1711	16/11/1946	A	MALE

Forename: DemoRecipTest1711
 Father Name Ltn:
 Grand Name Ltn:
 Surname: SurDemoRecipTest1711

Identification details:
 Birth Date: 16/11/1946
 Birth Date Hijri: 21/12/1365
 National ID Type: SAUDI ID
 National ID: 21234543343
 Date of issue:
 Date of expiry:
 Birth Place:

The Profile form contains general patient information. Language translation is optional.

Multi-organ requests are available. Parts of organs can also be transplanted.

Subject ID	Recip ID	Status	Registration Date	Birth Date	National ID	Name	Gender	BG/Rhesus	Registration Uni.
210202	100647	ACTIVE	17/11/2021 13:26	16/11/1946	21234543343	DemoRecipTest1711 SurDemoRecipTest1711	MALE	A /POSITIVE (+)	Hospital 1

Organ Name	Modify Organ	Organ Status	Offer Status
Renal Organ			
Pancreatic Organ			
Pancreas	Add		
Pancreas Islets	Add		
Hepatic Organ			
Liver			
Whole Liver	Add		
Left Liver Lobe	Add		
Left Lateral Liver Segment	Add		
Liver Segment Iv	Add		
Right Liver Lobe	Add		
Reduced Liver	Add		
Cardiothoracic Organ			
Heart/Lung Block	Add		
Heart	Add		
Lung Pair	Add		



APPLICATION FORMAT

Example images of application Laboratory Data forms: Serology, Sensitisation and HLA.

Forms are frequently updated. Serology data entry COVID-19 added, as per recent user requirements.

Sensitisation data is collected and affects the Matching Run algorithm.

Each HLA item automatically affects further items. The system aids users and minimises errors.

APPLICATION FORMAT

Example images of application Donation List, Actions & Matching Run.

Potential donors can be immediately added to the Donation List as a New Cases.

Case Status	OPEN	Retrieval Type	
210191	107198	OPEN	17/11/2021 ACTIVE
210185	107179	OPEN	17/11/2021 ACTIVE
210184	107178	OPEN	17/11/2021 ACTIVE
210145	107160	OPEN	17/11/2021 ACTIVE
-	-	OPEN	16/11/2021 ACTIVE
210043	107099	OPEN	15/11/2021 ACTIVE
210042	107098	OPEN	15/11/2021 ACTIVE
-	-	OPEN	15/11/2021 ACTIVE
-	-	OPEN	15/11/2021 ACTIVE
209992	107036	OPEN	26/10/2021 ACTIVE
-	-	OPEN	25/10/2021 ACTIVE
-	-	OPEN	25/10/2021 ACTIVE
209952	106996	OPEN	25/10/2021 ACTIVE

Each donor can donate both organs & tissues. Donor data is saved in forms.

Person ID: 210185 **Name:** DemoTissDonorTest1711 SurDemoTissDonorTest1711 **Birth Date:** 11/11/1969 **Death Date:** **National ID:** 213564564 **Gender:** MALE **BG/Rhesus:** A /POSITIVE (+)

ACTIONS: Case Details, Case Note, Organ Retrieval, Tissue Retrieval, Matching Run

FORMS: Donor Profile, Core Donor Data Form, Kidney Donor Form, Cornea Donor Form, Liver Donor Form, Cardiothoracic Donor Form, DRFUP, Print All

SCREENINGS: Serology Form, Haematology Form, Biochemistry Form, Kidney Function & Electrolytes Form, Blood Gases Form, Hemodynamic Form, Echo Test Form, Urine Output Form, Monitoring Data Form, HLA Form

The Matching Run shows matching recipients in order within seconds.

Matching run summary

Selected recipients	Count
All selected recipients	4
Medical Emergency (status 1)	2
O A, B, DR, DQ MM	1
Kidney combined with other solid organs (SPK, SLK and SHK, in ranking order)	1
Excluded recipients	Count
All excluded recipients	1731
Hla data incomplete	1697
Incompatible blood group	1182
EPFS score not met	1564

List of selected recipients

Mr Order	Offer	Recip Id	Birth Date	Name	Tx Center	Super Urgent	Paediatric	Waiting Time	Blood group	Cpra	Epts	Matchgrade	Hsp	Local	Prior Ld	Points Cpra	Points Dr	Points Dq	Points W
Medical Emergency (status 1)																			
1	☑	100641	08/11/2002	DemoTest16114 SurDemoTest16114	Hospital 2	Y	N	0	Identical	0	1	000	N	N	N	0	4		
1	☑	100636	02/11/1990	DemoTest15112 SurDemoTest15112	Hospital 3	Y	N	1	Identical	0	1	000	N	N	N	0	4		
O A, B, DR, DQ MM																			
2	☑	100169	04/08/2020	allProcessesMRRecipient3 allProcessesMRRecipient3	Hospital 5	N	Y	470	Identical	0	1	000	N	N	N	0	4		1
Kidney combined with other solid organs (SPK, SLK and SHK, in ranking order)																			
3	☑	100063	12/12/1988	Test2	Hospital 1	N	N	0	Identical	0	1	101	N	N	N	0	4		

APPLICATION FORMAT

Example images of application Dialysis List, Forms & Transfer.

The Dialysis List contains all patients on dialysis, including those who are on the Renal Waiting List.

Edit Info	Person ID	Dialysis ID	Fullname	Age	Gender	Blood Group	National ID	Dialysis Status	Dialysis Start Date	Transfer
	210202	103398	DemoRecipTest1711 SurDemoRecipTest1711	75	MALE	A POSITIVE (+)	21234543343	ACTIVE - ON WAITING LIST	17/11/2021	Transfer
	210190	103381	DialysisTest378273	80	FEMALE	B NEGATIVE (-)	1017463894	ACTIVE - ON WAITING LIST	16/11/2021	Transfer
	210188	103380	DialysisTest326	49	MALE	A POSITIVE (+)	67654676756	ACTIVE - ON WAITING LIST	10/11/2021	Transfer
	210187	103379	testUnspecDia testUnspecDia	21	MALE	O POSITIVE (+)	45373737373	ACTIVE - ON WAITING LIST	17/11/2021	Transfer
	210182	103378	DemoTest16114 SurDemoTest16114	19	FEMALE	A POSITIVE (+)	212439035	REMOVED - TRANSPLANTED	17/11/2021	Transfer
	210162	103358	DemoTest16113 SurDemoTest16113	42	MALE	A POSITIVE (+)	21238954	ACTIVE - ROUTINE	17/11/2021	Transfer
	210122	103338	DemoTest16111 SurDemoTest16111	47	MALE	A POSITIVE (+)	212438894	REMOVED - TRANSPLANTED	16/11/2021	Transfer
	210102	103318	testScenariosSBJ testScenariosSBJ	21	MALE	O POSITIVE (+)	134513435	REMOVED - TRANSPLANTED	16/11/2021	Transfer
	210003	103298	DemoTest15112 SurDemoTest15112	31	FEMALE	A POSITIVE (+)	2124839748	ACTIVE - ON WAITING LIST	15/11/2021	Transfer
	210001	103297	testPresentationKidneyRCP testPresentationKidneyRCP	21	MALE	O POSITIVE (+)	135486163543	REMOVED - TRANSPLANTED	15/11/2021	Transfer

HEMODIALYSIS FORM

Person ID: 210202, Dialysis ID: 103398, National ID: 21234543343, Name: SurDemoRecipTest1711 DemoRecipTest1711, Birth Date: 16/11/1946, BG: A, Gender: MALE

3. Dialysis Performance (2-6 monthly)

a) URR measurement:

Date:

Pre Urea:

Post Urea:

URR (%):

b) Delivered Kt/V measurement:

Date:

UKM modeling Kt/V:

Online modeling Kt/V:

If Other, please specify:

History:

Buttons: Save & Exit, Print, Go To Core Dialysis, Save To Hold, Save & Continue, Go To Medications & Treatment

The design can be customised to guide the user with dynamic menu & buttons.

Dialysis patients can be directly transferred to the Renal Waiting List from the Dialysis List.

PATIENT TRANSFER

Person ID: 210202, Name: SurDemoRecipTest1711 DemoRecipTest1711, Birth Date: 16/11/1946, Death Date: -, National Id: 21234543343, Blood Group / Rh: A+, Gender: MALE

DIALYSIS HISTORY

DIALYSIS STATUS CHANGE / TRANSFER

Dialysis Unit: Unit 7

Patient Status: ACTIVE - ON WAITING LIST

Transplant Center: Transplant Center 12

Event Date-Time: 29/11/2021 00:58

Change Reason Comment: Transfer to Waiting List.

Buttons: Cancel, Save

APPLICATION FORMAT

Example images of application Tissues Retrieval, Storage & Allocation.

All tissues can be retrieved, processed & segmented for every donor.

Tissue Name	Tissue Bank	Date Of Retrieval	Pkg Type	Retrieve	Processing	Segment	Tissue Delete	Offer
Ophthalmic Tissue				Retrieve				
Whole Eye				Retrieve				
Right Eye				Retrieve				
Cornea Right				Retrieve				
Sclera Right				Retrieve				
Left Eye				Retrieve				
Cornea Left				Retrieve				
Sclera Left				Retrieve				
Tissues				Retrieve				
Skin				Retrieve				
Skin Back				Retrieve				
Skin Arm				Retrieve				
Skin Arm Left				Retrieve				
Skin Arm Right				Retrieve				
Skin Thigh				Retrieve				
Skin Thigh Left				Retrieve				
Skin Thigh Right				Retrieve				
Skin Calf				Retrieve				
Skin Calf Left				Retrieve				
Skin Calf Right				Retrieve				
Vessels				Retrieve				
Artery				Retrieve				
Vein				Retrieve				
Vein Saphena Magna				Retrieve				

All tissue information is stored in Storage List & is identified by a unique global coding system.

Donation Link	Infection Flag	Organ Name	Seg	Tissue Status	Tissue Codes	Process Date	Tissue Size Text	Expiry Date	T _v	Storage Temperature	Processing Method	Viro Micro Link
104376		BONE FEMUR LEFT	3	STORED	EU-CODE20000000104376E00001603YYYYMMDD		20 l/mic/m2	30/06/2021		-160/-80		ViroMicro
104376		BONE FEMUR LEFT	1	STORED	EU-CODE20000000104376E00001600YYYYMMDD		20 l/mic/m2	30/06/2021		-160/-80		ViroMicro
104376		BONE FEMUR LEFT	5	STORED	EU-CODE20000000104376E000016005YYYYMMDD		20 l/mic/m2	30/06/2021		-160/-80		ViroMicro
104376		BONE FEMUR LEFT	2	STORED	EU-CODE20000000104376E00001602YYYYMMDD		20 l/mic/m2	30/06/2021		-160/-80		ViroMicro
104376		BONE HUMERUS LEFT	1	TRANSPLANTATED	EU-CODE20000000104376E00002100YYYYMMDD		10 cm	17/07/2021		+4/8		ViroMicro
104376		BONE HUMERUS LEFT	2	STORED	EU-CODE20000000104376E00002100YYYYMMDD		10 cm	17/07/2021		+4/8		ViroMicro
104376		BONE HUMERUS LEFT	3	STORED	EU-CODE20000000104376E000021003YYYYMMDD		10 cm	17/07/2021		+4/8		ViroMicro
104356		BONE HUMERUS LEFT	1	RETRIEVED	EU-CODE20000000104356E00002100YYYYMMDD	13/05/2021	10 cm	17/07/2021		-80		ViroMicro
104356		BONE HUMERUS LEFT	2	RETRIEVED	EU-CODE20000000104356E000021002YYYYMMDD	13/05/2021	10 cm	17/07/2021		-80		ViroMicro
104356		BONE HUMERUS LEFT	3	TEMPORARY ALLOCATED	EU-CODE20000000104356E000021003YYYYMMDD	13/05/2021	10 cm	17/07/2021		-80		ViroMicro
105776		BONE FEMUR LEFT	1	RETRIEVED	EU-CODE20000000105776E0000160010210703			23/07/2021				ViroMicro
104918		BONE HUMERUS RIGHT	3	STORED	EU-CODE20000000104918E000021003YYYYMMDD		10 micro g/kg/m/m	01/08/2021		+4/8		ViroMicro
104918		BONE HUMERUS RIGHT	1	STORED	EU-CODE20000000104918E00002100YYYYMMDD		10 micro g/kg/m/m	01/08/2021		+4/8		ViroMicro
104918		BONE HUMERUS RIGHT	2	STORED	EU-CODE20000000104918E000021002YYYYMMDD		10 micro g/kg/m/m	01/08/2021		+4/8		ViroMicro
104917		BONE HUMERUS LEFT	2	STORED	EU-CODE20000000104917E000021002YYYYMMDD		6.87 micro g/kg/m/m	05/08/2021		+4/8		ViroMicro

Tissue is allocated directly to recipient with no need for a Recipient Waiting List.

Recip ID	Tissue	Registration Status	Request Status	Name	Birth Date	Registration Unit
100643 1054	BONE HUMERUS	ACTIVE	CONFIRMED	DemoTissRecipTest1711 SurDemoTissRecipTest1711	04/11/1977 212345345	Unit 1

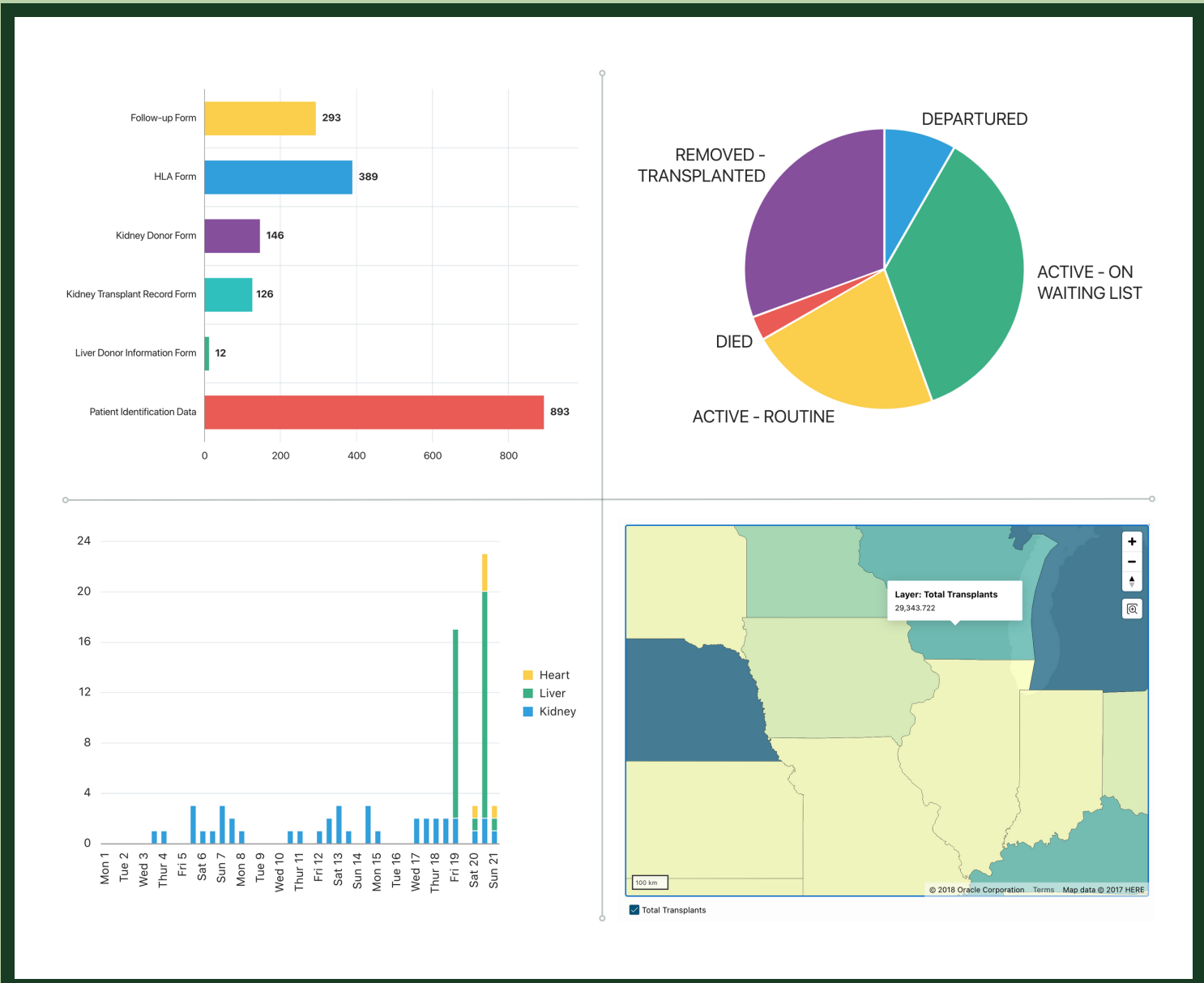
Alloc	Donor Id	Tissue	Seg	Organ Status	Tissue Bank Name	Tissue Code	Tissue Size	Expiry Date	Storage Date	Storage Type	Storage Temperature
<input type="checkbox"/>	107936	BONE HUMERUS	2	TEMPORARY ALLOCATED	Test tissue bank 2	EU-CODE20000000107936E00002100220220409	100 cm	09/04/2022	09/11/2021	2	
<input type="checkbox"/>	107158	BONE HUMERUS	1	STORED	Test tissue bank 3	EU-CODE30000000107158E000021010110220402	100 cm	02/04/2022	17/11/2021	7	-80
<input type="checkbox"/>	107158	BONE HUMERUS	2	STORED	Test tissue bank 3	EU-CODE30000000107158E00002100220220402	100 cm	02/04/2022	17/11/2021	7	-80
<input type="checkbox"/>	107160	BONE HUMERUS	2	STORED	Test tissue bank 3	EU-CODE30000000107160E00002100220220211	100 cm	11/02/2022	17/11/2021	12	-160/-80
<input type="checkbox"/>	107179	BONE HUMERUS	1	STORED	Test tissue bank 2	EU-CODE20000000107179E00002101022020409	200 cm	09/04/2022	17/11/2021	11	+4/8

Images display no real data. They are for demonstration purposes only.

APPLICATION FORMAT

Example images of application statistical data for Data Collection, Waiting List, Matching Run & Regional Transplantations.

Wide range of statistical data can be extracted for reports & presentations.





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