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TISSUE MANAGEMENT SYSTEM

NATIONAL TRANSPLANT PROCUREMENT
AND INFORMATION SYSTEM FOR TISSUES AND CELLS

EXPANSION OF NATIONAL ORGAN REGISTRY

National Transplant Procurement and Information System for Tissues and Cells

MAIN TISSUE MODULES

- Tissue donation and harvesting process (Procurement Donation)
- Tissue screening and processing (Testing, Processing)
- Tissue registering and quarantine (Preservation)
- National storage and procurement (Storage, Distribution)
- Importing, exporting and logistics (Import, Export)
- Single KSA coding system for tissues and cells for human applications compatible with EU coding system
- Online tissue requests and recipient registration
- National allocation system of tissues and cells
- Transplantation
- Internal tissue establishment (TEs)/TEs forms processing
- Follow up forms processing
- Serious adverse reaction and events alert system (SARE)
- National statistics and reporting
- System auditing and administration

EVERY LIFE MATTERS

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



MAIN TISSUE FORMS

Donation

- Tissues and Cells Core Donor Data Form
- Tissue Retrieval Form

Recipient

- Cornea/Sclera Request and Registration Form
- Tissue Request and Registration Form

Transplant

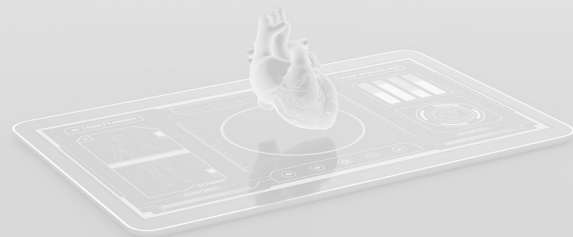
- Transplant Patient Protocol

Follow Up (FUP)

- Adverse Reactions, Rejections and Infections
- Adverse Deviation

Tissue Establishment Processing

- Skin Processing
- Processing of Valves
- Processing of Vessels
- Ligaments Processing
- Ophthalmic Tissues Processing
- Cartilages Processing
- Other Tissue Processing
- Cultivation of Cells



Other

- Report of Adverse Deviation

TISSUE AND CELLS PROCUREMENT PROCESS

1	Waiting Lists of Active, Suspended, Transplanted and Removed Tissues	9	Recipient Profile
2	Storage Lists of Retrieved, Processed, Quarantine, Preserved, Stored, Temporary Allocated, Expedited, Imported, Discarded, Outdated, Infected, Advanced Treatment, Exception Treatment, Research, and Transplanted Tissues and Cells	10	Tissue Request and Registration Form
3	Virology Screenings	11	Donor and Recipient Outcome Form
4	Microbiology Screenings	12	Hold, Live Form Inputting and Data Amendment
5	Donor Profile	13	Annual Reports, Hold Reports, Live Reports, Processing Reports, SARE Reports
6	Donation and Harvesting	14	Biostatistics of Transplantations, Donors, Tissues, Recipients, Waiting List and Tissue Requests
7	Donor Medical History	15	Admin of Application, Roles, Users, Hospitals, Transplant Units, Tissue Establishments, Subjects
8	Donor Serology, Haematology Screening	16	Audit

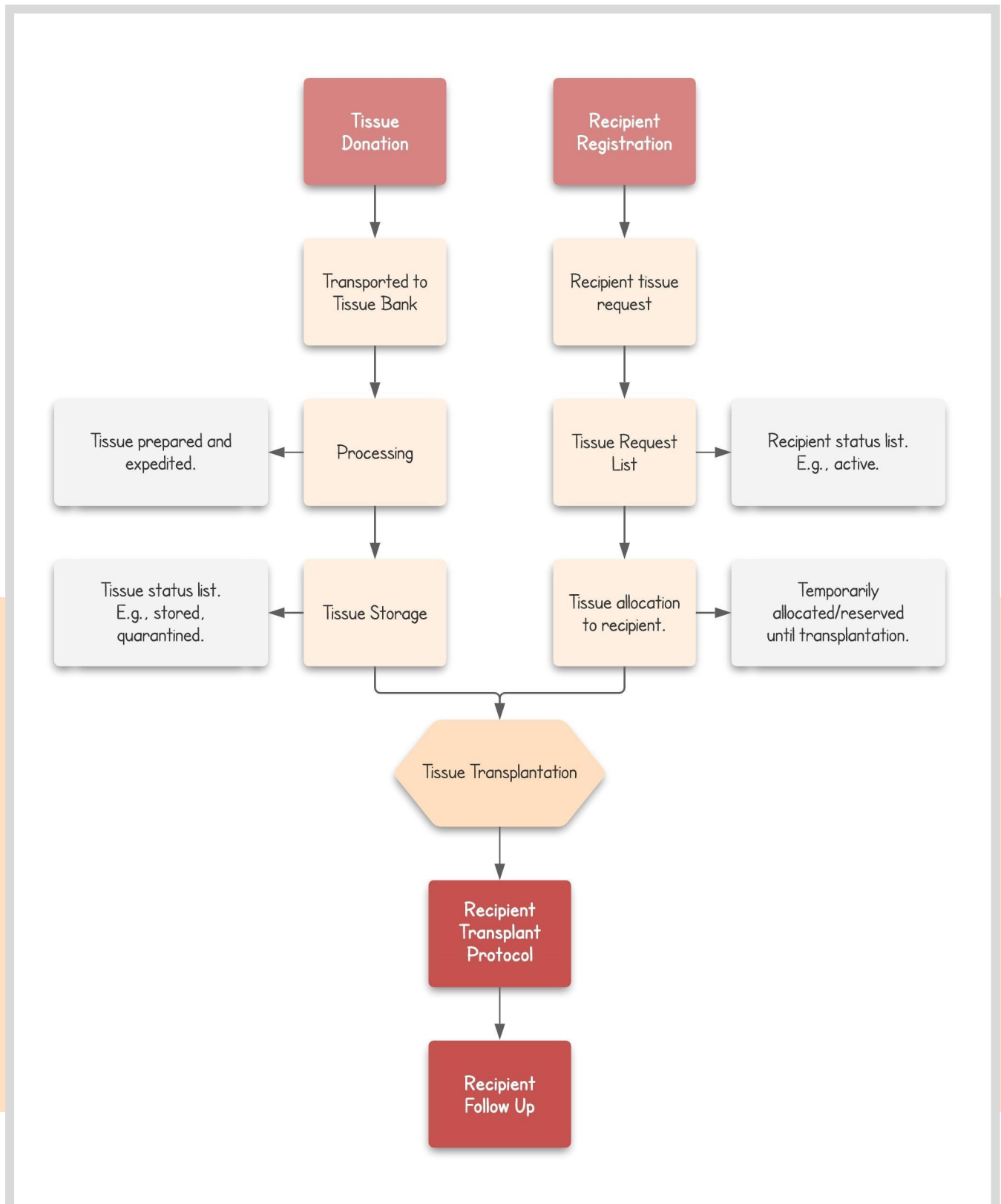


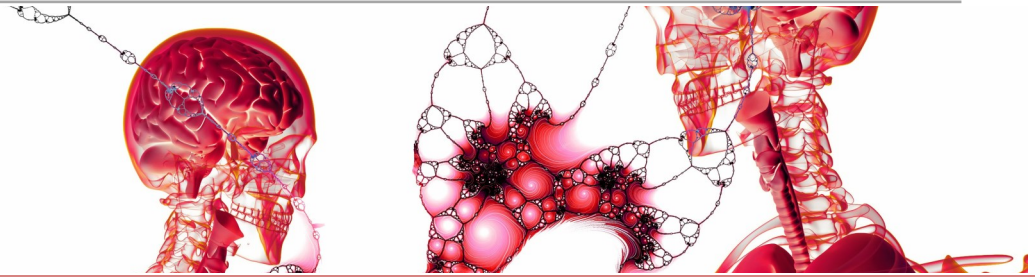
GUIDED PROCESS

The National Transplant Procurement and Information System dynamically guides the user through the donation and transplantation process.

DONATION AND RECIPIENT TRANSPLANTATION PROCESS

Flowchart of tissue donation, processing, recipient request, transplantation and follow up.





EXTRA APPLICATION FEATURES

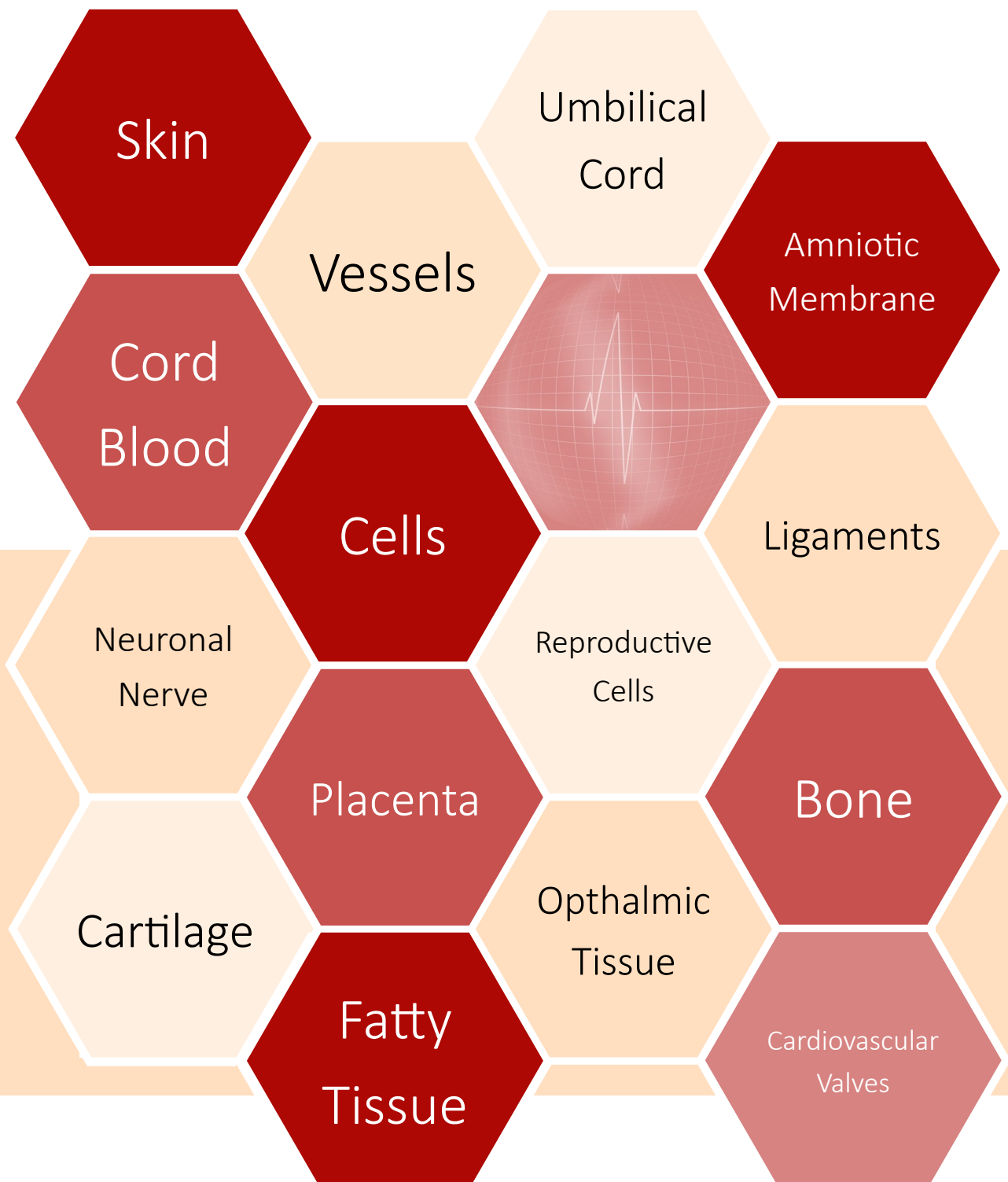
- Foreign hospitals, transplant centers, research facilities and Tissue Banks are included.
- Tissues can be expedited into smaller tissue parts and each logged into the system separately. These can be allocated to multiple recipients.
- Information on different Tissue Retrieval teams (who, for example, perform enucleation on donor) are included for each Tissue Bank .
- Tissue processing forms are adapted to different tissue types and their specific requirements.
- Dashboard, forms and information can be customised and adjusted.
- Privileges and roles can be assigned to each user.
- An administration user can have access to all areas of the process.

FAST, EFFICIENT & RELIABLE

The National Transplant Procurement and Information System unifies transplant practices, enables equal access to tissue and helps guarantee the safety of transplant procedures and traceability.

CURRENTLY PROCURED TISSUE TYPES

List of a few main tissue types. In total, there are 84 different tissue types and 4634 tissue products for processing, procuring and transplanting.



PROPOSED APPLICATION LAYOUT SCREENSHOTS - DONATION

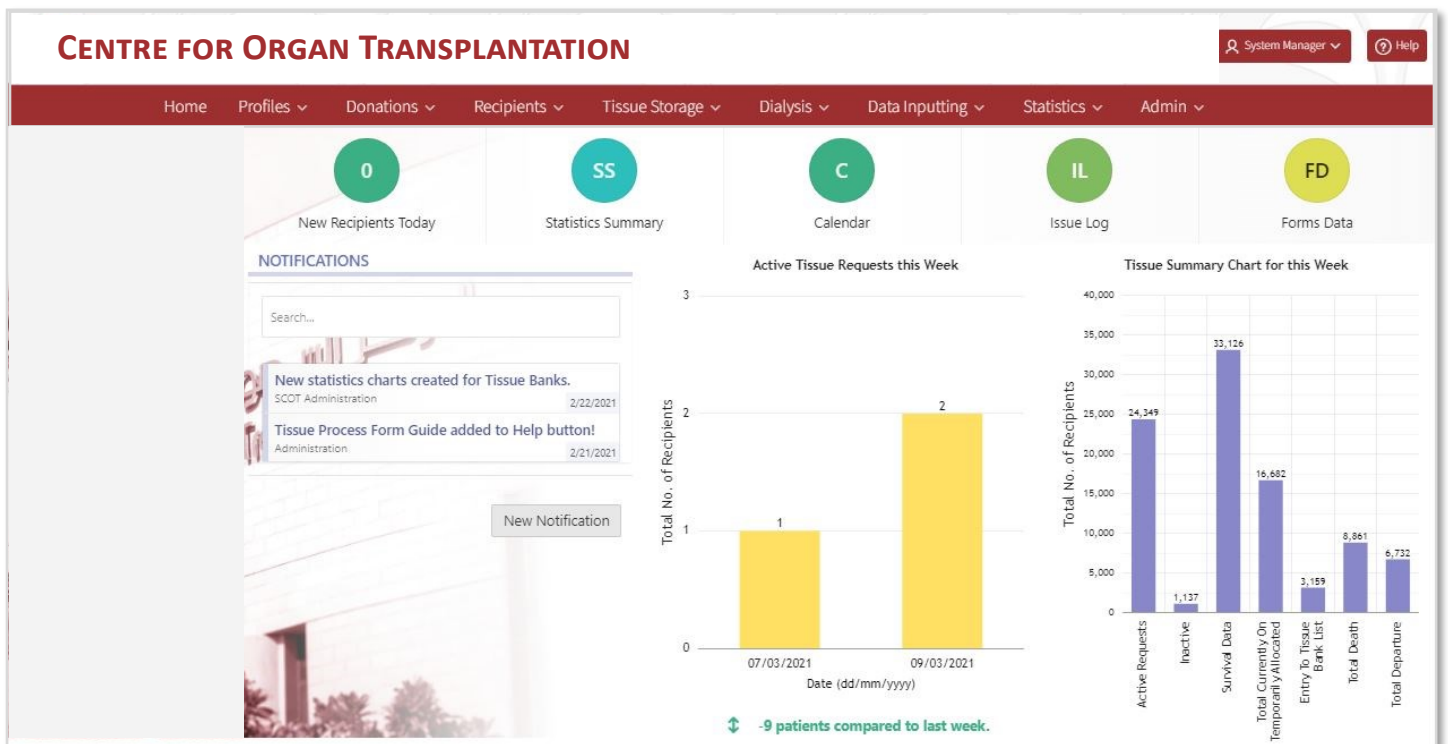


Figure 1. - Example of Administration User Dashboard, displaying relevant tissue data. National tissue storage monitored, managed by individual tissue establishments and embedded into the National Registry.

Tissue identification				Size		Storage				
Tissue bank	Tissue	Tissue Status	Segment	Tissue Code	Tissue Size	Tissue Size Type	Expiry Date	Storage Date	Storage Type	Storage Temperature
Test ophthalmic ba...	Cornea	Stored	1	SITESTNA00000000...			22/05/2022			
Test tissue bank 2	Skin	Stored	1	SITESTNA00000000...	12	cm2	22/05/2022	15/10/2020	Fresh	+4/6
Test tissue bank 2	Skin	Stored	4	SITESTNA00000000...	4	cm2	22/05/2022			
Test tissue bank 2	Skin	Stored	2	SITESTNA00000000...	5	cm2	22/05/2022			
Test tissue bank 2	Skin	Stored	3	SITESTNA00000000...	4	cm2	22/05/2022			
Test tissue bank 2	Skin	Stored	5	SITESTNA00000000...	2	cm2	22/05/2022			
Test tissue bank 2	Skin Back	Temporary Allocat...	40	EU-CODE20000000...	30	cm2	24/12/2020	24/12/2020	Dehidirano	+15/35
Test tissue bank 2	Skin Back	Temporary Allocat...	42	EU-CODE20000000...	10	cm2	31/12/2020			
Test tissue bank 2	Skin Arm	Retrieved	1	EU-CODE20000000...			14/03/2026	15/03/2021		
Test tissue bank 2	Skin Arm	Retrieved	1	EU-CODE20000000...			14/03/2026	15/03/2021		
Test tissue bank 2	Skin Arm	Retrieved	2	EU-CODE20000000...			14/03/2026	15/03/2021		
Test tissue bank 2	Skin Arm	Retrieved	3	EU-CODE20000000...			14/03/2026	15/03/2021		
Test tissue bank 2	Skin Thigh	Retrieved	1	EU-CODE20000000...			14/03/2026	15/03/2021		
Test tissue bank 3	Skin Thigh Left	Retrieved	4	EU-CODE30000000...	4	cm2	24/12/2020	15/12/2020	Frozen	-120
Test tissue bank 3	Skin Thigh Left	Temporary Allocat...	8	EU-CODE30000000...	1.33	cm2	24/12/2020	15/12/2020	Frozen	-120

Figure 2. - Example of Donation Tissue Bank List. This screenshot shows online monitoring of all tissues and its status in the country.

Figures may contain modifications to hide confidential information.

PROPOSED APPLICATION LAYOUT SCREENSHOTS - DONATION FORMS

CORE DONOR DATA FORM

Manager System Help

Donation ID	National ID	Name	Birth Date	BG	Gender
205204	103567	testTissueRetireve testTissueRetireve	16/03/2000	O	MALE

Show All Donor Details Donor Condition Observations Past Medical History Drugs

Tissue Retrieval

Tissue Bank

Tissue

Date and time of retrieval

Enucleation Team

Transport Medium

Type of encapsulation

Serial No

ATB

ATB Note

Validation Print Save & Continue Save & Exit

Figure 3. - Example of Core Donor Data Form section for single tissue retrieval.

SEROLOGY FORM ENTRY

Manager System Help

Donation ID	National ID	Name	Birth Date	BG	Gender
205204	103567	testTissueRetireve testTissueRetireve	16/03/2000	O	MALE

Serology History

Labs Serology

Hospital Id * ABDUL KARIM BAKR MEDICAL CENTER

Lab Test Date *

Lab Test Stage *

HBsAg * HBsAb *

HBcAb * HCV *

HIV * HBV (Vaccine) *

CMV EBV

HTLV Toxo

Syphilis HEV

Validation Print Save & Continue Save & Exit

- SCREENINGS
 - Serology Form
 - Haematology Form
 - Biochemistry Form
 - Urea and Electrolytes Form
 - Blood Gases Form
 - Hemodynamic Form
 - Echo Test Form
 - Urine Output Form
 - Monitoring Data Form
 - HLA Form

Figure 4. (above) and 5. (right) - Example of Serology form and screenshot of Screening form menu. All relevant Screening forms are available for tissue donors.

Figures may contain modifications to hide confidential information.

PROPOSED APPLICATION LAYOUT SCREENSHOTS - DONOR TISSUES

DONOR TISSUES
Help

Donor ID	Status	Donation Date	National ID	Name	Birth Date	Gender	BG/Rhesus	Hospital	
205204	103567	ACTIVE	16/03/2021 19:17	123545654456	testTissueRetireve testTissueRetireve	16/03/2000	MALE	O /POSITIVE (+)	Abdul Karim Bakr Bh

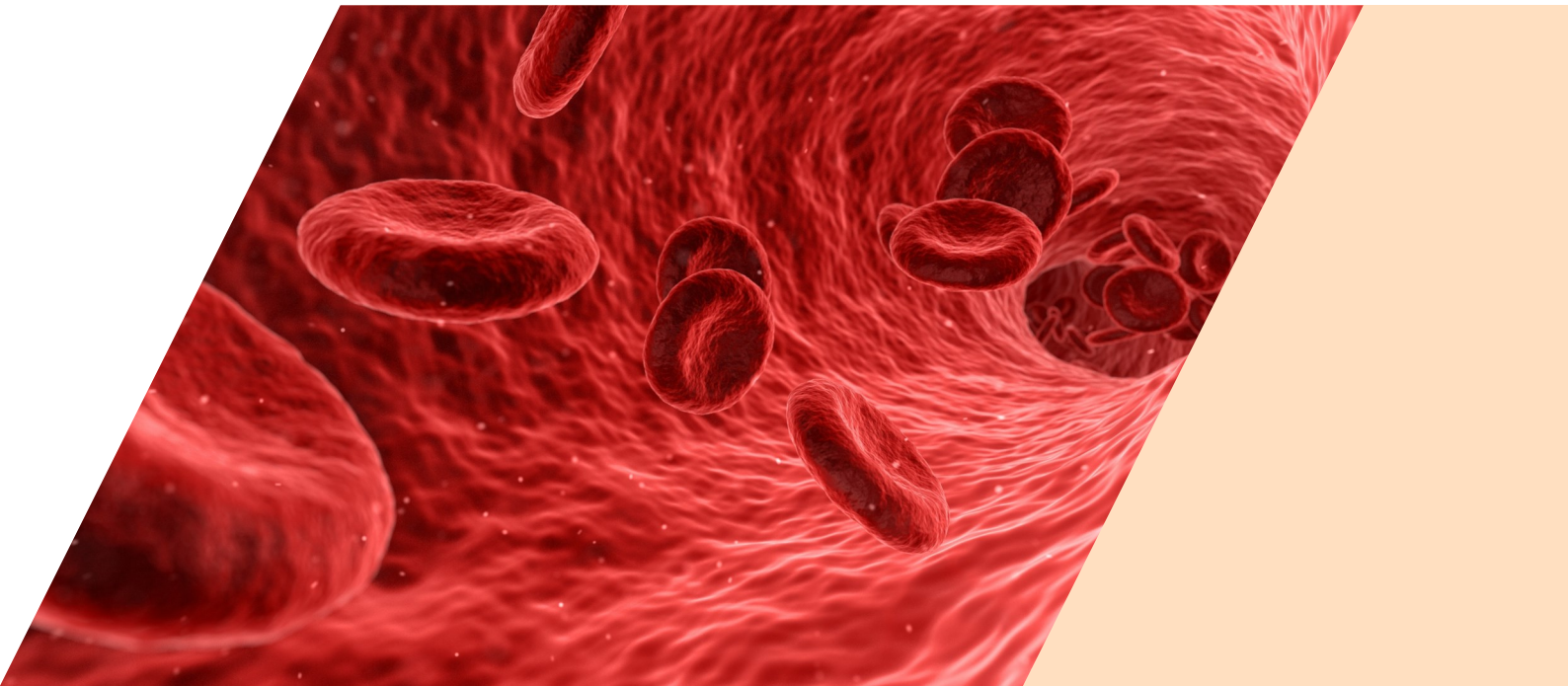
Donation Info

Donor tissues

Select Tissue group: All Tissues

Tissue Name	Tissue Bank	Date Of Retvireval	Pkg Type	Segments
Tissues				
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

Figure 6. - Donor Tissues. Example of multi tissue retrieval donor section.



LIST OF TISSUES

Amniotic Membrane	Patella Bone Right	Ligamentum Achilei Included Calcanea
Bone	Bone Fibula	Ligamentum Achilei Included Calcanea Right
Bone Humerus	Bone Fibula Left	Ligamentum Achilei Included Calcanea Left
Bone Humerus Left	Bone Fibula Right	Milk Teeth
Bone Humerus Right	Bone Calcaneus	Neuronal Nerve
Bone Femur	Bone Calcaneus Left	Permanent Teeth
Bone Femur Left	Bone Calcaneus Right	Umbilical Cord
Bone Femur Right	Bone Calva	Ophthalmic Tissue
Bone Tibial	Bone Marrow	Sclera
Bone Tibial Left	Cardiovascular Valves	Right Sclera
Bone Tibial Right	Cartilages	Left Sclera
Bone Femur Head	Thoracic Cartilages	Ophtalmic Group 1
Bone Femur Head Left	Meniscus	Cornea
Bone Femur Head Right	Meniscus Left	Right Cornea
Bone Femur Diaphysis	Meniscus Right	Left Cornea
Bone Femur Diaphysis Left	Ear Cartilage	Sclera
Bone Femur Diaphysis Right	Cells	Right Sclera
Bone Tibial Diaphysis	Cells Biopsy Of Limbal Cells	Left Sclera
Bone Tibial Diaphysis Left	Cells Biopsy Of Skin For Keratinocytes	Ophtalmic Group 2
Bone Tibial Diaphysis Right	Cells Biopsy Of Cartilages For Chondrocytes	Whole Eye
Bone Femur Resection	Cells Biopsy Of Bone For Osteoblasts	Right Eye
Bone Femur Resection Left	Pancreas For B Cells	Right Cornea
Bone Femur Resection Right	Primordial Cells	Right Sclera
Bone Tibial Resection	Hematopoietic Stem Cells	Left Eye
Bone Tibial Resection Left	Reproductive Cells	Left Cornea
Bone Tibial Resection Right	Rc Early Embryo	Placenta
Bone Femoral Condyle	Rc Ovum	Reproductive Cells
Bone Femoral Condyle Left	Rc Semen	Skin
Bone Femoral Condyle Right	Autologous Mononuclear Cells	Skin Back
Bone Tibial Condyle	Autologous Mononuclear Cells	Skin Arm
Bone Tibial Condyle Left	Bone Marrow Cells	Skin Arm Left
Bone Tibial Condyle Right	Cord Blood	Skin Arm Right
Bone Scapula Hip	Fatty Tissue	Skin Thigh
Bone Scapula Hip Left	Ligaments	Skin Thigh Left
Bone Scapula Hip Right	Ligamentum Patelae	Skin Thigh Right
Bone Sternum	Ligamentum Patelae Left	Skin Calf
Bone Sternum Left	Ligamentum Patelae Right	Skin Calf Left
Bone Sternum Right	Ligamentum Achilei	Skin Calf Right
Bone Knee	Ligamentum Achilei Left	Vessels
Bone Knee Left	Ligamentum Achilei Right	Aorta
Bone Knee Right	Ligamentum Fascia Lata	Artery
Bone Ribs	Ligamentum Fascia Lata Left	Vein
Bone Humeral Condyle	Ligamentum Fascia Lata Right	Vein Saphena Magna
Bone Humeral Condyle Left	Ligamentum Fascia Temporalis	Vein Saphena Magna Left
Bone Humeral Condyle Right	Ligamentum Fascia Temporalis Left	Vein Saphena Magna Right
Bone Crista Iliaca	Ligamentum Fascia Temporalis Right	
Bone Crista Iliaca Left	Ligamentum Pericardial	
Bone Crista Iliaca Right	Bone-To-Bone	
Patella Bone	Bone-To-Bone Left	
Patella Bone Left	Bone-To-Bone Right	

PROPOSED APPLICATION LAYOUT SCREENSHOTS - RECIPIENT REGISTRATION

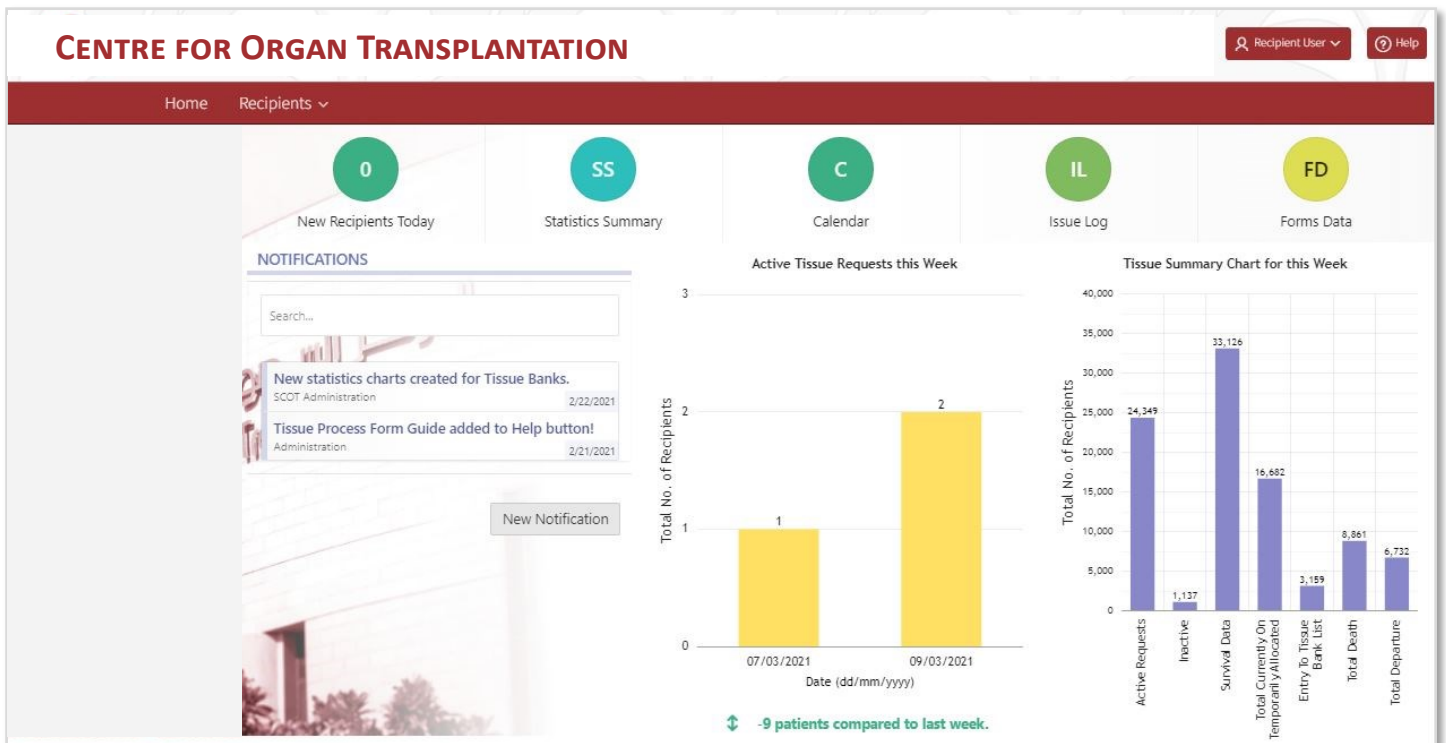


Figure 7. - Example of Recipient User Dashboard, displaying relevant tissue data. Tissue requests and recipient registrations embedded into the National Registry.

PROFILE

Recipient User | Help

Recipient ID	National ID	Name	Birth Date	BG	Gender
204984	100358	123546879864	testoffDateRecip1 testoffDateRecip1	04/03/2000	O MALE

Validation | Print | Save & Continue | Save & Exit

Show All | Name | Identification details | Contact | Patient Demographics

Name

Forename * | Father Name Ltn | Grand Name Ltn | Surname *

testoffDateRecip1 | | | testoffDateRecip1

الإسم الأول | إسم الأب | إسم الجد | إسم العائلة

_____ | _____ | _____ | _____

Identification details

Birth Date * | 04/03/2000 | Birth Date Hijri | 28/11/1420

National ID Type * | IQAMA | National ID * | 123546879864

Date of Issue | _____

Figure 8. - Example of Recipient Profile form.

PROPOSED APPLICATION LAYOUT SCREENSHOTS - TISSUE REQUEST

TISSUE REQUESTS													
Search: All Text Columns [Go] [Actions] [Reset]													
Subject				Registration			Request				Donor		
Subject Id	Fullname	Id Number	Birth Date	Registration	Registration	Registration	Request Id	Request Date	Requested T	Request Stat	Tissue Code	Donor Id	Segment Id
100195	JAMES LO... XXX	223344	01/05/2000	100072	15/10/2019	INACTIVE	2	02/05/2020	Sclera	Active (0)			
202662	testOrgan...	64543546...	19/10/2020	100219	19/10/2020	ACTIVE	30		Skin Thig...	Confirme...	EU-CODE... 102925 EU-CODE... 102925	102925 102925 102925	7 6 4 3
203100	ishenko je...	657657587	24/04/1993	100253	07/11/2020	ACTIVE	14	01/12/2020	Skin Back	Confirme...	EU-CODE... 102925 EU-CODE...	102925 102925 102925	42 41 40
203640	aa aaad	12344134...	09/12/1990	100290	15/12/2020	ACTIVE	50		Mitral He...	Active (0)			
203640	aa aaad	12344134...	09/12/1990	100290	15/12/2020	ACTIVE	51	16/12/2020	Skin Back	Confirme...			
203640	aa aaad	12344134...	09/12/1990	100290	15/12/2020	ACTIVE	70	22/12/2020	Bone Hu...	Active (0)			
203863	Desat Desat مراكش...	13243546	22/12/1990	100301	26/12/2020	ACTIVE	110		Bone	Active (1)			
203865	Jedenast J... تيتشسف...	53342133	11/11/2001	100302	26/12/2020	ACTIVE	91	26/12/2020	Bone Hu...	Confirme...	EU-CODE... 102925 EU-CODE... 102925	102925 102925 102925	4 3 2
Total 8													

Figure 9. - Example of Tissue Requests List. National tissue requests list monitored by the Administration and managed by tissue establishments.

Tissue allocation											
Recipient Details											
Recip ID	Status	Registration Date	National ID	Name	Birth Date	Gender	BG/Rhesus	Transplant Unit			
28830				Test Patient 007 ccc							
Allocated tissues											
Segment				Size				Storage			
Donor Id	Tissue	Segment Id	Status	Tissue bank	Tissue Code	Tissue Size	Tissue Size Type	Expiry Date	Storage Date	Storage Type	Storage Temperatu
102925	Skin Thigh Left	4	Retrieved	Test Tissue Ban...	EU-CODE3000...	4	cm2	24/12/2020	15/12/2020	Frozen	-120
102925	Skin Thigh Left	6	Temporary Allo...	Test Tissue Ban...	EU-CODE3000...	4	cm2	24/12/2020	15/12/2020	Frozen	-120
102925	Skin Thigh Left	3	Temporary Allo...	Test Tissue Ban...	EU-CODE3000...	4	cm2	24/12/2020	15/12/2020	Frozen	-120
Total 3											
New Tissue allocation											
Search: All Text Columns [Go] [Actions] [Reset]											
Donor	Tissue	Segment Id	Status	Tissue	Tissue	Tissue	Tissue	Expiry	Storag	Storag	Storage

Figure 10. - Tissue Allocation details for Recipient. Includes segmenting, splitting and pooling.



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