Tissue Transplantation: Past, Present and Future

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Tissue Transplant

• Medical procedure in which a tissue is transferred from one person (donor) to another (recipient)
  – life and/or function restoring procedure
TISSUE TRANSPLANTATION
PAST
Tissue Transplant: Past

- 3000 BC: first description of skin transplant (ancient India)

- Susruta (600 BC): rhinoplasty and skin transplant for a mutilated nose.....in 7 easy steps

Tissue Transplant: Past

- 346: Leggenda Aura (Golden Legend of Lives of the Saints) “Miracle of the Black Leg”

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Tissue Transplant: Past

- 1597: Gaspare Tagliacozzi “Surgery of the Mutilated by Grafting”
- 1668: grafting of animal bone to a human
- 1800s: clinical skin grafting (auto and allografts)

Tissue Transplant: Past

• 1905: the first corneal transplant by Eduard Zirm (Vienna, Austria)

Tissue Transplant: Past

• 1912: Alexis Carrel receives Nobel Prize in Medicine

Carrel A. The Preservation of tissues and its application in surgery. JAMA 1912;59:527
Tissue Transplant: Past

- 1944: the first eye bank (New York)
- 1949: U.S. Navy Tissue Bank (Bethesda, MA)
- 1950s: tissue banks in Europe
- 1961: Eye Bank Association of America
- 1976: American Association of Tissue Banks
- 1991: European Association of Tissue Banks

Carrel A. The Preservation of tissues and its application in surgery. JAMA 1912;59:527
TISSUE TRANSPLANTATION
PRESENT
PRESENT
Tissue Banking

- Approximately 40,000 tissue allografts transplanted annually (~80% imported)

- Comprehensive Tissue Banks
- Surgical Bone Banks
- Musculoskeletal Tissue Banks
- Eye Banks
- Other Tissue Specific Banks
Tissue Banking vs. TISSUE DONORS

OCCULAR DONORS

ALLOGRAFT YIELD PER DONOR

DONOR PER MILLION POPULATION

TISSUE DONORS

OCCULAR DONORS

ALLOGRAFT YIELD PER DONOR

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CBS OTDT
Alberta Organ and Tissue Donation Registry

Overview

An exciting first for Albertans! You can now sign up to be an organ and/or tissue donor on MyHealth.Alberta.ca.

It's important that you understand what it means to be a donor and how important your choice is. Tell your family and loved ones that you have signed up to be a donor. They will then be prepared to speak on your behalf.

Please read the information about donation on MyHealth.Alberta.ca. Check back often as more information is added. For a list of frequently asked questions, see the FAQs.

We appreciate any questions or comments you may have. Please send them through this link.

For information about organ and tissue donation, and who can donate, please see Organ and Tissue Donation Overview.
Comprehensive Tissue Centre

- Comprehensive tissue bank operated by Alberta Health Services in Edmonton
- Accreditations and Licenses
- Cadaveric and living donor programs
The Comprehensive Tissue Centre takes great pride in providing safe, effective and high quality allograft tissue for transplantation through excellence in practice and leadership in research.
CTC: Transplantable Tissues

- Heart valves
- Eyes
- Skin
- Bone
- Tendons
- Amniotic Membrane
Tissue Banking Process

deceased donor

living donor

donor referral consent

donor screening infectious disease testing

HOPE Program
Palliative Care
Family
Medical Examiner’s Office
Direct Approach
Hospital staff

Clinics
Hospital staff
Patients

deferral
discard

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Tissue Banking Process Cont’d

donor screening
infectious disease testing

- donor admission

- tissue recovery

- transportation to CTC

- deferral

- discard

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Recipient Forms, CTOSS
Quality Management System

• Designed to prevent, detect, and correct deficiencies that may lead to increased risk of introduction, transmission, or spread of communicable diseases
  – Environmental control and monitoring
  – Donor suitability and screening
  – Supplies, reagents, equipment and process controls
  – Good documentation practices
  – Internal/external audits and inspections
  – Corrective and preventative actions
  – Training and competencies
1028 patients benefited from the CTC team efforts in 2014

- Referrals: 2490
- Donors: 485
- Recipients: 1028
- Gifts of Tissue Distributed: 1976
- Gifts of Tissue Recovered: 2558

1028 patients benefited from the CTC team efforts in 2014
TISSUE TRANSPLANTATION FUTURE
Tissue Transplant: Future

2005: the first successful facial transplant

2008: transplant of a bioengineered trachea


Tissue Transplant: Future

- Corneal Tissue Engineering
- Blood Vessel Tissue Engineering
- Liver Tissue Engineering
- Cartilage Tissue Engineering
- Bone Tissue Engineering
In Conclusion......
Tissue Donation: Gift of Life

When Lee Flannigan-McMaster died three years ago, at age 16, his parents agreed to donate his tissues, which have benefited 18 recipients to date.

My son has a new life.
He’s here.
I’m grateful beyond words for your gift, for your family’s courage to make the decision they made.
But because of that, he lives.
I can never thank you enough, we can only promise to live our lives the best that we can... for all of us.

Samuel Bentley,
Tissue recipient.
“Good news — they found you a donor for a smile transplant!”