Human Organ Donation System in India

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Introduction

The Indian Society of Organ Transplantation was established in 1987 with a goal to provide a common forum to all involved in the transplant activity. The society initiated from CMC Vellore and its inaugural meeting was held at Institute of Kidney Disease and Research Centre, Civil Hospital, Ahmedabad in 1988. The society has over 650 members which include clinicians, basic scientists and others involved in the field of transplantation.

Organ Donation is the process of giving an organ or a part of an organ for the purpose of transplantation into another person. An organ transplants is surgical operation in which a failing or damage organ in the human body is removed and replaced with a functioning one. The donated organ may be from a diseased donar, a living donar, or an animal. In some cases an artificial organ is used.

History

Researchers began experimenting with organ transplantation in animal and humans in the 18th century. Over the years, scientists experienced many failures, but by the mid-20th century, successful organ transplants had been performed. The first successful livingdonar transplants was done between 23rd year old identical twins in 1954.

Transplants of kidneys, liver, hearts, lungs, pancreas and small bowel are now considered an accepted part of medical treatment. Bone marrow transplants are saving lives, corneal transplants are restoring sight and medical miracles are happening every day.

During last 20 years, important medical breakthroughs such as tissue typing and development of immunosuppressive drugs have allowed for more successful organ transplants and a longer survival rate for transplants recipients. The most notable developments in this area was Jean Borel`s discovery of an immunosuppressive drugs called cyclosporine in the mid-1970s. This drug was approved for commercial use (in the U.S.) in 1983.

Unfortunately, the need for organ transplants continues to exceed the organ supply. Fifteen people die each day (or one person dies every 1 hours and 45 minutes) due to the shortage of transplantable organ; and every 18 minutes a new name is added to the transplants waiting list. But as medical technology improves, and more donars become available, thousands of people each year will live longer and better lives.

The Major Aims and Objectives

1. To collect information about organ donation and NGO`s or Hospitals working for the same in India
2. Inform people about the benefits of organ donation to society.
3. Clear up the misconceptions surroundings organ donations.
4. Help people make more informed decisions when they receive this information.
5. Help people fully understand the circumstances of becoming donar.
6. Provide reasons to why organ donation can benefit you and society as a whole.
7. Provide facts (such as statistics) in order to aid other in reaching a true understanding of organ donation.
8. Respects decisions made by individuals about their decisions to donate/ not donate their organs.
9. To promote and encourage new transplant centres in the country
10. To promote, develop and exchange the scientific knowledge and technical cooperation between clinical scientists and others involved in the field of transplantation
11. To prompt the scientific research in various aspects of transplantation

12. To disseminate newer knowledge and information amongst the general public
13. To create public awareness regarding organ donation and transplantation
14. To facilitate or provide financial assistance to individuals/organizations involved in the promotion of transplantation
15. To interact with the States and Central Government in formulating national policies in the field of transplantation
16. To print, publish, distribute or sell books, pamphlets, pictures, periodicals, newspapers or magazines or other materials concerning the specialty of transplantation
17. To institute awards, fellowships, scholarships, stipends, remuneration to the students, research scholars and deserving members to enable them to perform research in the field of transplantation
18. To organize national, international and regional meetings, conferences, CME, exhibitions and circulate study material for the research in the field of transplantation
19. To cooperate with other national, international societies, agencies and individuals to promote the objectives of the society
20. To review and update the legislative framework around organ and tissue donation.
21. To ensure donors and families are supported during and after donation.
22. To communicate about the need, value and process of organ and tissue donation to the public.
23. To provide education to health professionals about the need, value and process of organ and tissue donation.
24. To monitor and evaluate standards implementation and use of resources; and
25. To identify, learn from and help define best practices related to the Organ and Tissue Program.

Need of Organ Donation: Donating an organ after death is more than just the physical act of giving a part of your body that is of no use to you anymore. Many of us believe that we should make ourselves useful and help people who are less fortunate than we are. Organ donation gives us the opportunity to be of use and help people even after we are not around anymore. Organ donation is a very noble deed, indeed!

We donate organs in order to give other people a better chance, a life or a chance at life period. If, god forbid, you ever find yourself in need of a kidney, I guess you'll understand how important it is. Every organ in our body can be transplanted. Donating your organs is important because it might save someone else's loved one, you can help someone else live a healthy longer life. Organ donation is harvesting organs from one body and transplanting then into another body. Organ transplantation can save or prolong the life of a person. In accidental cases we can save anyone life. Just about every organ in your body can be donated, including your eyes and skin (which is considered an organ). You can't use it the afterlife

Advantages: The biggest advantage to organ donation is it saves lives that would otherwise be lost. A single organ donor has the chance to save the lives or improve the quality of life for several people. Families of organ donors may be able to correspond with the recipients of their loved one's organs, which may give them the sense that some good came out of tragedy, particularly if the donor were very young. Those who donate the whole body often are making contributions to medical advancement, as cadavers may be used for the education of medical students. There is no cost to organ donors or their families, and the body will not be disfigured for funeral services.

Disadvantages: At one time, certain religions objected to organ donation. Now, most support these procedures, so in most cases that disadvantage has been removed. A disadvantage to organ donation is the donor or his family has no say in who receives the donated organs. Organs may be donated to recipients who have very different religious or political views or to people the donor may not have considered deserving. For this reason, donors have to believe all life is sacred and one recipient isn't more valuable than another.

Living Organ Donation: Organs are sometimes donated when the donor is still alive. This is especially true when the person needing a donation is a family member. Organs and tissues that may come from living donors include a kidney, portion of the liver, lung, intestine or pancreas. A disadvantage to living organ donation is that all surgery carries the risk of medical error, infection and even death. There is also a risk of future health problems. For instance, if you donate a kidney, there is no guarantee your remaining kidney will remain healthy throughout your life. An additional disadvantage is the donation may be rejected. If this happens, the donor may end up feeling she went through the discomfort and risk for nothing.

Organs that can be donated are as Follows: The major donor organs and tissues are heart, lungs, liver, pancreas, kidneys, eyes, heart valves, skin, bones, bone marrow, connective tissues, middle ear, blood vessels. Therefore, one donor can possibly give gift of life to many terminally ill patients who would not survive otherwise.

S. No.	Organ
1	Heart
2	Lungs
3	Liver
4	Pancreas
5	Intestines
6	Eyes, ear & nose
7	Skin
8	Bladder
9	Nerves
10	Brain and spinal cord
11	Skeleton
12	Gall bladder
13	Stomach
14	Mouth & tongue
15	Muscles

It means that a person pledges during his lifetime that after death, organs from his/her body can be used for transplantation to help terminally ill patients and giving them a new lease of life.

There are two way of organ donation:

1. **Living related donors**: Only immediate blood relations (brother, sister, parents children) can donate as per the Transplantation of Human Organ Act 1994. Living donor can donate only few organs, one kidney (as one kidney is capable of maintaining the body functions), a portion of pancreas (as half of the pancreas is adequate for sustaining pancreatic functions) and part of the liver (as the few segments that are donated will regenerate after a period of time) can be donated.
2. **Cadaver Organ donors**: Can donate all organs after brain death.

Purpose: To determine the "awareness of eye donation" and "willingness to pledge organ for donation" in the population of all over India.

What is the brain death?

It is the irreversible and permanent cessation of all brain functions. Brain can no longer send messages to the body to perform vital functions like breathing, sensation, obeying commands etc. Such persons are kept on artificial support (ventilation) to maintain oxygenation of organs so that the organs are in healthy condition until they are removed. Most cases of brain death are the end result of head injuries, brain tumours patients from Intensive care units. Organs of such patients can be transplanted in organ failure patients to provide them a new lease of life.

How is brain death diagnosed?

It how is brain death diagnosed? It is done by independent advice of a team of doctors whose qualification and experience is accepted by the hospital for such purposes. Doctors carry out a set of tests to confirm brain death.

How quickly should the organs be donated?

Healthy organs should be transplanted as soon as possible after brain death from the donor to the recipient.

Who can be a Donor?

Anyone, regardless of age, race or gender can become an organ and tissue donor. If he/she is under the age of 18 years, then the consent of parent or legal guardian is essential. Medical suitability for donation is determined at the time of death.

Eye Transplantation

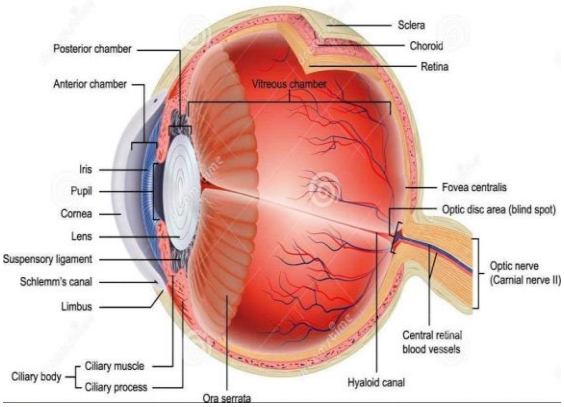


Fig. 1: Human eye

What is Eye Donation?

Eyes can be donated only after death. A living person can only make a pledge to donate eyes after death. To translate a pledge to an actual donation after ones death, it is essential to inform our close ones about our wish. They need to call by this noble act. Don't bury or burn eyes. Let your eyes see after you die.

Magnitude of Blindness Problem?

India has about 1,25crore blind people and at least 30 lakh of these are corneally blind who could benefit from eye donation. Out of about 80 lakh deaths in a year in India, only 18 thousand donated eyes in 2008. Due to poor availability the waiting list of patients is long and it may take 6 - 12 months to get a suitable cornea.

Who is benefited by Eye Donation?

Corneal Transplant is the most frequently done organ transplant and also the most successful amongst organ transplants. Sight can be restored to people who have lost vision due to damaged cornea, which is the transparent layer in the front portion of the eye. Vision may improve fully (6/6) or partially if there are other eye problems. Corneal transplants can fail in some patients due to rejection and non-rejection problems.

Who is not benefited by Eye Donation?

Sight cannot be restored if blindness is due to damage to structures other than the cornea such as the retina and optic nerve. The whole eyeball cannot be transplanted and only the damaged cornea can be replaced with a donated healthy cornea.

Who can Donate?

Any person irrespective of age, sex, blood group and religion can donate eyes after death. Prior registration is not essential. Diabetes, blood pressure, those using spectacles, those with prior eye surgery or eye problems can all donate.

Who cannot donate?/ When are Eyes not useable?

When there is a risk of disease transmission from one person to another, eyes cannot be donated. Persons having infections such as AIDS, jaundice (Viral Hepatitis), rabies, meningitis, tetanus, septicemia (generalised infection) etc. cannot donate. Blood cancers and cancers which have spread to the eye or the brain cannot also donate.

Procedure of Eye Donation?

Call the nearest eye bank as early as possible, though it is possible to donate upto six hours after death. Inform the eye bank regarding the age, cause of death and exact address. Keep the eyes closed. Switch off the fans above. Raise the head with a pillow. If available keep icepacks over the closed eyes. Keep death certificate and medical records ready. Eyes are removed by a MBBS Doctor affiliated to a Registered Eye Bank or Eye donation centre. Removal of eyes is a simple procedure, which takes only 10-15minutes and does not lead to any facial disfiguration or delay in funeral arrangements. It can be done at home or in the hospital. No payment is required for donating eyes.

Hospital Cornea Retrieval Program?

Hospital deaths are an excellent source for quality donor tissues. Younger donor age and availability of medical records is a distinct advantage. A simple request by the attending team for eye donation is enough to set the ball rolling. Better coordination between eye banks & hospitals is the need of the hour.

How are the Eyes Preserved?

After removal, eyes are kept at 4 degrees in an icebox and transported to the Eye Bank. In the eye bank, the corneas are cut and placed in special media where they can be kept up to 4 days at 4 degrees. Good quality corneas are used for vision restoration. Suboptimal quality corneas are used for saving the eye in severe infections. Poor quality corneas are used for practice surgery to train doctors, or for research. Sclera (White layer of the eye) is also used for patch grafts or for fixing implants after removal of eye.

What is an Eye Bank?

It is a nonprofit social organization which collects donated eyes and processes them for utilization by eye surgeons. In India the first eye bank was started in Madras in 1945. In India legislation was first passed by the Bombay state in 1957to regulate eye donation. (Bombay Corneal Grafting Act). The Transplantation of Human Organs bill (HOTA) was enacted in 1994 which includes corneal transplantation in its purview. An association of eye banks named as the Eye Bank Association of India (EBAI) with its headquarters in Hyderabad was established in 1989 to promote eye donation, advance eye banking and coordinate the activities of various eye banks in India.

Legal Hurdles?

1. Non availability of doctors for eye removal is a significant hurdle. Permission to trained technicians to remove eyes is likely to overcome this problem.
2. **Required Request:** Doctor has to request relatives for eye donation in all cases of death. Normally even a simple request motivates 10% of people which could be a big boost for eye donation.
3. **Presumed Consent:** All corneas can be removed unless there is a specific objection from next of kin.
4. **Unclaimed bodies:** Presently organs cannot be removed before 48 hours by which time eyes are no more vital for use.
5. **Post-mortem cases:** Permission to remove cornea unless the dead person had wished not to donate.

Problems Faced by Donors?

Eye banks are trying to provide good service but at times eye banks are not contactable at night or doctors are unavailable to attend calls. There are instances of refusal to attend calls due to frivolous reasons. Lack of Eye banks in rural areas and non-metros is a hurdle that will require a lot of efforts.

First Corneal Transplant?

The first corneal transplant was carried out by Dr Eduard Zirm, an ophthalmic specialist in Olomouc, now in the east of the Czech Republic on 7/12/1905. The recipient was a laborer who had been blinded in an accident while working with lime. The man who received the first cornea transplant was given no antibiotics, no drugs to stop him rejecting the tissue - and had to endure his eyelids being sewn shut for 10 days before he knew if the procedure had worked. The operation was a success, and the 43-year-old patient could see again. He retained his eyesight for the rest of his life and was back working on his farm within three months. The corneas came from an 11-year-old boy who had been blinded by deep injuries to his eyes.

Request

Pledge your Eyes today and motivate your family and friends to join you in this noble act. Remember to call an Eye Bank whenever there is a death in the family or in friends. It is a noble act. Don't be scared to suggest it to others.

Eye banks

Eye Banks in Mumbai	Tel. Nos.
Babulnath-Navneet	2369 3937
Borivali – Rotary	98216 01919
Byculla-JJ Hospital	2375 0102
Dadar-Gokhale	2422 7425,1820
Dombivali-Manav Kalyan	95251-2449563
Girgaon-Harkissondas	6610 5555
Panvel-Laxmi	2745 3147,4060
Parel-Eye Bank Centre	2416 4342, 2929
Santacruz-Clear vision	2604 6898
Sion-LTMG hospital	2407 6381
Thane-Sahyara	2534 1919
Vasai - Blind relief	95250-2308287
Vikhroli to Mumbra-Bahena	93222 13877
Vile parle-Cooper	2620 7257
Wadala-Aditya Jyot	2417 7600
Tarun Mitramandal	1919

Cornea Transplantation

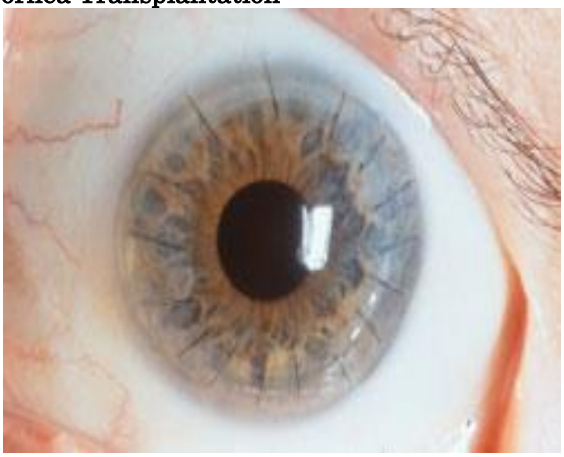


Fig. 2: Human Cornea

Introduction

The cornea is the tissue on the very front of the eye. It is clear and covers the iris and pupil. It works with the lens to provide focusing power to the eye. If the cornea becomes opaque, swollen, or scarred, vision is compromised. Medication to control the damage to the cornea is usually the first line of treatment, but once it is clear that medication will not halt or alter the damage, a corneal transplant is considered. This surgical procedure involves the removal of the damaged tissue and replacement with a healthy, donated human cornea. Because this procedure is a transplant of foreign tissue into the eye, rejection of the tissue by the immune system of the recipient is the greatest risk. However, drugs can be used to hold back the rejection reaction both before it occurs and even after the fact. Despite the availability of immunosuppressive drugs, the rejection rate for corneal transplants remains between 5 to 30% of the time.

Procedure of Transplantation: The transplant procedure involves removing the diseased or damaged tissue, then replacing it with the donor tissue. The entire operation is done under a surgical microscope. After taking measurements of the amount of tissue to be removed, the diseased corneal is cut and lifted away from the eye with a special round tool that works much like a cookie cutter called a trephine. Once the damaged tissue is removed, the donor cornea is cut to a matching size and placed on the patient's eye. It is held in place with very fine stitches using suture material that is about as thin as a hair. If there is also a cataract present, this can be removed at the same time and replaced with an intraocular lens. At the conclusion of the corneal transplant procedure, a patch and a metal shield are place over the eye to protect it.

Risks and Limitations: The greatest risk with corneal transplants is rejection, although this can be treated with immune suppressive medicine if caught in the early stages. Other risks that are much less prevalent but do occur are infection, bleeding, swelling or detachment of the retina, or glaucoma. All of these medical complications can be treated. Cornea transplant is a relatively safe procedure. Still, a cornea transplant does carry a small risk of serious complications, such as:

1. Eye infection
2. Increased risk of clouding of the eye's lens (cataracts)
3. Pressure increase within the eyeball (glaucoma)
4. Problems with the stitches used to secure the donor cornea
5. Rejection of the donor cornea
6. Swelling of the cornea

Another type of problem that can happen with the transplant is an irregular curvature (astigmatism) that can slow the development of clear vision. This can be treated with Rigid contact lenses. Corneal transplants are most successful if the damaged cornea is the sole vision problem in the eye. If other damage is present, particularly if due to a continuing condition, such as diabetes, vision can remain compromised even after the transplant.

A Number of Conditions can be Treated with a Cornea Transplant, including:

1. Thinning of the cornea
2. Cornea scarring, caused by infection or injury
3. Clouding of the cornea

4. Swelling of the cornea
5. Corneal ulcers, including those caused by infection
6. Complications caused by previous eye surgery

Signs and Symptoms of Cornea Rejection: In some cases your body's immune system may mistakenly attack the donor cornea. This is called rejection, and it may require another cornea transplant.

1. Loss of vision
2. Pain
3. Redness
4. Sensitivity to light

Heart Transplantation

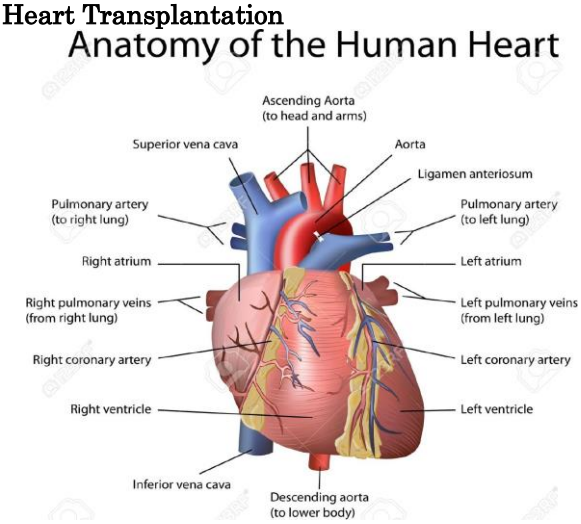


Fig. 3: Human Heart

Introduction

A heart transplant is surgery to remove a person's diseased heart and replace it with a healthy heart from a deceased donor. Ninety percent of heart transplants are done on patients who have end-stage heart failure. A heart transplant is an open-heart surgery in which a severely diseased or damaged heart is replaced with a healthy heart from a recently deceased person. It may be a treatment option for heart failure due to conditions such as coronary artery disease, cardiomyopathy, congenital heart disease or valve disease. Heart transplantation has made great strides over the years. Today, more than 85 percent of heart recipients will live at least an additional year and more than 70 percent will live five more years. However, patients continue to face a lengthy waiting list to receive a donor heart.

Researchers are working to develop equipment to improve the health and comfort for patients waiting for a donor heart and, ideally, to develop a mechanical heart that could permanently solve the shortage problem. People who receive a heart transplant can expect to spend 10 days to two weeks in the hospital. The medical team will join them in the fight to keep the new heart free from infection or rejection by the body.

After being discharged from the hospital, patients must continue to take their medications and keep follow-up appointments. There are many changes that come with having a new heart, and depression is not uncommon. The support of family and friends during this difficult time is an important part of recovery.

The Heart Transplant Process

The heart transplant process starts when doctors refer patients who have end-stage heart failure to a heart transplant center for evaluation. Patients found to be eligible for a heart transplant are placed on a waiting list for a donor heart. Heart transplant surgery is done in a hospital when a suitable donor heart is found. After the transplant, patients are started on a lifelong health care plan. The plan involves multiple medicines and frequent medical checkups.

Specialists Often Include for Heart Transplantation:

1. Cardiologist (a doctor who specializes in diagnosing and treating heart problems)
2. Cardiovascular surgeon (a doctor who does the transplant surgery)
3. Transplant coordinator (a person who makes arrangements for the surgery, such as transportation of the donor heart)
4. Social worker
5. Dietitian
6. Psychiatrist

Who cannot Donate?

Patients who have the following conditions might not be candidates for heart transplant surgery because the procedure is less likely to be successful.

1. Advanced age. Although there's no widely accepted upper age limit for a heart transplant, most transplant surgery is done on patients younger than 70 years old.
2. Poor blood circulation throughout the body, including the brain.
3. Kidney, lung, or liver diseases that can't be reversed.
4. History of cancer or malignant tumors.
5. Inability or unwillingness to follow lifelong medical instructions after a transplant.
6. Pulmonary hypertension (high blood pressure in the lungs) that can't be reversed.
7. Active infection throughout the body.

Signs and Symptoms:

1. Shortness of breath
2. Fever
3. Weight gain due to water retention
4. Not urinating as much as usual
5. Fatigue

Other Risks Following Your Heart Transplant Include:

1. Problems with your arteries. After your transplant, it's possible the walls of the arteries in your heart could thicken and harden, leading to cardiac allograft vasculopathy (CAV). This can make blood circulation through your heart difficult and can cause a heart attack, heart failure, heart arrhythmias or sudden cardiac death.
2. Medication side effects. The immune suppressants you'll need to take for the rest of your life can cause serious kidney damage and other problems.
3. Cancer. Immunosuppressants can also increase your cancer risk. Taking these medications can put you at a greater risk of skin and lip tumors and non-Hodgkin's lymphoma, among others.
4. Infection. Immunosuppressants decrease your body's ability to fight infection. Many people who have heart transplants have an infection that requires them to be admitted to the hospital the first year after their transplant.

Other Heart Transplant Procedure:

1. Coronary artery disease
2. Congenital Heart Defects
3. Heart Valve Disease
4. Pulmonary Hypertension
5. Valvular Heart Disease
6. Cardiomyopathy

Liver Transplants

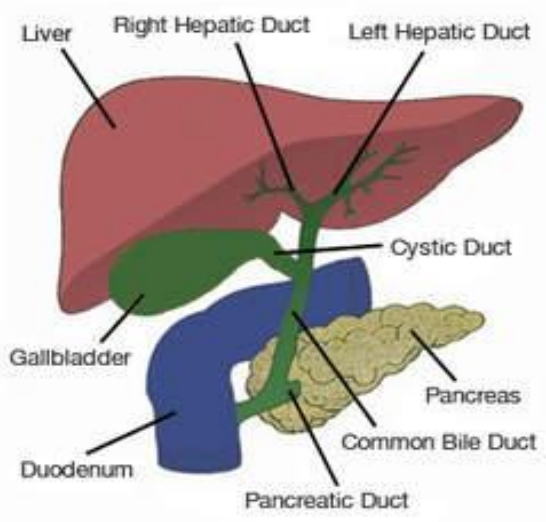


Fig. 4: Human Liver

Introduction

Your Physician may recommend a liver transplant when all other treatment options fail. The purpose is to replace your diseased liver with a healthy liver. Ideally, after a transplant you will be free from disease, and lead a fairly normal life as long as the transplant functions .Liver transplantation is surgery to remove a diseased liver and replace it with a healthy liver from an organ donor. A liver transplant is necessary when disease makes the liver stop working. The most common reason for liver transplantation in adults is cirrhosis, a disease in which healthy liver cells are killed and replaced with scar tissue. The most common reason for transplantation in children is biliary atresia, a disease in which the ducts that carry bile out of the liver are missing or damaged.

Liver transplantation is usually done when other medical treatment cannot keep a damaged liver functioning. About 80 to 90 percent of people survive liver transplantation. Survival rates have improved over the past several years because of drugs like cyclosporine and tacrolimus that suppress the immune system and keep it from attacking and damaging the new liver. Liver damage from cirrhosis cannot be reversed, but treatment can stop or delay further progression and reduce complications. Treatment depends on the cause of cirrhosis and any complications a person is experiencing. Regardless of the cause of cirrhosis, it is essential that every patient avoid all substances, habits and drugs that may further damage the liver or cause complications or liver failure. Alcohol, in addition to causing cirrhosis, may accelerate the progression of liver scarring. All patients with liver disease should not drink any alcohol. Medications also may be given to control the symptoms of cirrhosis.

Who Needs a Liver Transplant?

Medical treatment for liver diseases and liver damage is always the first choice of therapy. The only reason to perform a liver transplant is that all other forms of treatment have been unsuccessful, and the patient's liver can no longer support life. This is called end stage liver disease. There have been over 60 different liver diseases treated with liver transplantation. However, there are several conditions that are more commonly treated with this procedure. They are frequently conditions that cause chronic or continuing liver inflammation. As the inflammation heals, fibrous tissue forms, much like a scar forms when a cut in the skin heals. Severe and advanced scarring of the liver is called Cirrhosis. Cirrhosis is not reversible and leads to end stage liver disease

Pre-Transplant Evaluation: Pre transplant tests are done to evaluate the severity of the liver disease. Once this initial evaluation is complete, the case is presented to a review committee of physicians and other staff members of the hospital.

A Living Donor/ Recipient may undergo some of the Following Tests before the Transplantation

CT scan of the abdomen: This is a computerized picture of the liver that allows the doctor to determine the liver size and to identify any abnormalities, including liver tumors, which may interfere with the success of a liver transplantation.

Ultrasound of the liver: This is a study that uses sound waves to create a picture of the liver and the surrounding organs. It also determines how well the blood vessels that carry blood to and from the liver are working.

ECG: Short for electrocardiogram, this is a study that shows the electrical activity of the heart.

Blood tests: These include blood type, blood cell count, blood chemistries, and viral studies.

Dental clearance: A person's regular dentist may fill out the form. Immunosuppressive medications may affect the teeth; therefore, a dental evaluation is important before beginning these medicines.

Gynecological clearance: The patient's gynecologist may provide clearance.

Purified protein derivative (PPD) skin test: The PPD test is performed on the arm to check for any exposure to tuberculosis

Rejection

Rejection is a normal reaction of the body to a foreign object. When a new liver is placed in a person's body, the body sees the transplanted organ as a threat and tries to attack it. The immune system makes antibodies to try to kill the new organ, not realizing that the transplanted liver is beneficial. To allow the organ to successfully live in a new body, medications must be given to trick the immune system into accepting the transplant and not thinking it is a foreign object.

Preventing rejection: Home care also involves taking several medications to help the liver survive and to prevent the patient's own body from rejecting the new liver. A person with a new liver must take medications for the rest of his or her life. The immune system works to protect the body from invading bacteria, viruses, and foreign organisms. Unfortunately, the body cannot determine that the newly transplanted liver serves a helpful purpose. It simply recognizes it as something foreign and tries to destroy it. In rejection, the body's immune system attempts to destroy the newly transplanted liver. Without the intervention of immunosuppressive drugs, the patient's body would reject the newly transplanted liver.

Although the medications used to prevent rejection act specifically to prevent the new liver from being destroyed, they also have a general weakening effect on the immune system. This is why transplant patients are more likely to get certain infections. To prevent infections, the patient must also take preventive medications. There are 2 general types of rejection, as follows: Immediate, or acute, rejection occurs just after surgery, when the body immediately recognizes the liver as foreign and attempts to destroy it. Acute Liver rejection occurs in about 2% patients. Delayed, or chronic rejection can occur years after surgery, when the body attacks the new liver over time and gradually reduces its function. This occurs in 2-5% of patients.

Indications For liver Transplant Include:

Acute Liver Failure

1. Due to poisons or Hepatitis Chronic Liver Diseases (Cirrhosis)
2. Alcohol induced
3. Cryptogenic.
4. Viral Hepatitis Related Liver Tumours There are two primary options for liver donation.
5. Liver Donation from a patient who has undergone brain death. (Deceased Donor Liver Transplantation, DDLT)
6. Donation of Part of the liver from another person (Living Donor Liver Transplantation LDLT). At AIMS we perform both DDLT and LDLT, However fisrt degree relatives are preferred as donors for LDLT.

Living Donor: Living-donor transplantation entails the removal of a portion of the donor's healthy liver into another person who is in need of transplantation (recipient). A family member, usually a parent, sibling or adult child (above the age of 18 years) or someone emotionally close, such as a spouse, may volunteer to donate a portion of their healthy liver.

Liver Transplant Symptoms

People Who Have Liver Disease may have many of the Following Problems:

1. Jaundice - Yellowing of the skin or eyes
2. Itching Dark, tea-colored urine
3. Gray- or clay-colored bowel movements
4. Ascites - An abnormal buildup of fluid in the abdomen
5. Vomiting of blood
6. Tendency to bleed
7. Mental confusion, forgetfulness

Exams and Tests: If a patient comes to the hospital or an emergency department, the doctor will obtain blood tests, liver function tests, blood clotting tests, electrolytes, and kidney function tests. The doctor may also draw blood levels of certain immunosuppressive medications to make sure they are in the right range. If an infection is considered possible, cultures for viruses, bacteria, fungi, and other organisms may be grown. These may be checked for in the urine, sputum, and

blood. A Recipient May Undergo Some Of The Following Tests Before The Transplantation:

Side Effects:

1. Increased susceptibility to infection
2. Weakened bones (osteoporosis)
3. Muscle weakness
4. Salt and water retention
5. Potassium loss
6. Easy bruising
7. Stretch marks
8. Nausea
9. Vomiting
10. Gastric (stomach) ulcers
11. Increased cholesterol and triglyceride levels
12. Increased hunger
13. Blurred vision
14. Rounded face ("chipmunk cheeks")
15. Enlarged abdomen
16. Inability to sleep
17. Mood swings
18. Hand tremors (shaking)
19. Acne
20. Steroid dependency

Children's Liver Transplant: A liver transplant is recommended for children who have serious liver dysfunction and will not be able to live without having the liver replaced. The most common liver disease in children for which transplants are done is biliary atresia. Other diseases may include Alagille syndrome, alpha-1-antitrypsin deficiency, Wilson's disease, hepatitis, and hemochromatosis.

Kidney Transplants

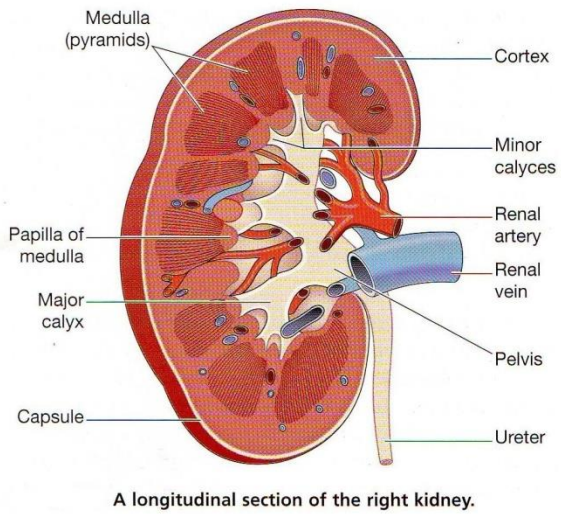


Fig. 5: Human Kidney

Introduction

Kidney transplantation involves placing a healthy kidney into the body where it can perform all of the functions that a failing kidney cannot. Kidney transplantation is the best way to treat kidney failure or end-stage renal disease (ESRD). The benefits of a successful kidney transplant are many. Most people find they have increased stamina and energy. They can return to a more normal lifestyle, and those who were dependent upon dialysis can enjoy newfound freedom. Over the years, the number of successful transplants has continued to grow. However, if a kidney transplant is not successful, the recipient can return to a regular dialysis schedule. It is possible to undergo more than one transplant.

Where does a Kidney come from?

Kidneys for transplantation come from two different sources - living donors, or non-living (cadaveric) donors. Living donors are usually immediate family members or sometimes spouses. Cadaver kidneys are obtained from persons who have willed their kidneys before their death by signing organ donor cards. Permission for donation can also be given by the descendent's family at the time of death. All donors are carefully screened to prevent any transmissible diseases.

How is the right Kidney found for me?

Determining in advance whether a donated kidney is likely to be tolerated by your body is crucial to the success of your transplant. It is essential that your blood type and the donor's blood type - whether Type A, B, AB, or O - be compatible. Your tissue type and the donor's must also be compatible. We use an HLA (human leukocyte antigens) blood test to determine your tissue type, which is the unique design of the tissue antigens that you inherited. Your blood will also be tested to determine whether you have antibodies to other tissue. Antibodies are substances your body produces to destroy foreign materials. While you wait for a kidney, you are asked to supply several tubes of blood each month to monitor these antibodies. Some of the blood will be stored and used for testing compatibility with potential donors. All blood tests are performed in the Tissue Typing Lab.

Donor blood type	Patient blood type
A	A or AB
B	B or AB
AB	AB
O	Any blood type: A, B, AB or O

The Kidney Transplant Procedure

Kidney transplantation involves placing a healthy kidney into the body where it can perform all of the

functions that a failing kidney cannot. In most cases, the diseased kidneys, located in the back area, remain undisturbed. The new kidney is positioned in the pelvic area where it is surgically connected to nearby blood vessels. Thanks to years of experience, research, and improved medications that prevent rejection, kidney transplants are overwhelmingly successful and post-operative complications for transplant patients are few. On average, 85-90% of kidney transplants are successful for at least two years, the traditional measurement point for success, and most for many years more. The new kidney is placed on the lower right or left side of your abdomen where it is surgically connected to nearby blood vessels. Placing the kidney in this position allows it to be easily connected to blood vessels and the bladder. The vein and artery of your new kidney are attached to your vein and artery. The new kidney's ureter is attached to your bladder to allow urine to pass out of your body.

Tissue typing prior to kidney transplant at hospitals in India: Tissue typing is a blood test that evaluates the compatibility between the tissue of the donor and the patient. The human leukocyte antigen test, also known as HLA, is a test that detects antigens (genetic markers in white blood cells that trigger antibody production). The HLA test is used to verify tissue compatibility typing of tissue recipients and donors

Siblings (brothers and sisters) usually have the best chance of being a perfect match (6 of 6 antigens). Recent developments in anti-rejection medications have cut down the occurrence of rejection in kidneys from unrelated donors

Cross matching prior to kidney transplant at hospitals in India: Blood samples of the donor and the patient are allowed to mix in the laboratory. If the interface does not result in any cell damage, compatibility is indicated. On the other hand, if cells begin to die, the conclusion is non-compatibility. If the blood tests indicate compatibility, the potential donor is examined to verity that his physical condition does not preclude the donation. Counseling is also provided.

Kidney rejection after kidney transplant at hospital in India: Kidney rejection is caused when the body's immune system recognizes the transplanted kidney as a 'foreign' object and activates the body's defence mechanism. The degree of rejection depends on a number of factors including the extent of mismatch between the donor and the patient's tissues.

Rejection is overcome by taking medications every day. Anti-rejection medications have possible side effects (high blood pressure, weight gain and a susceptibility to infections and tumors) because the body's immune system is suppressed. The side effects usually are manageable for most patients.

Risks of Kidney Transplantation

As with any surgery, the common risks are bleeding, infection, or breathing problems. The patient could be more prone to infections, as immune-suppression medication taken after transplantation lowers the body's defence against infection. The specific risk is organ rejection.

Bone Marrow Transplantation

Introduction

Bone marrow is a spongy tissue found inside bones. The bone marrow in the breast bone, skull, hips, ribs and spine contains stem cells that produce the body's blood cells. This is where the blood cells (RBC's, platelets and WBC's) are produced where they develop. These blood cells include white blood cells (leukocytes), which fight infection; red blood cells (erythrocytes), which carry oxygen, to and remove waste products from organs and tissues; and platelets, which enable the blood to clot. Each of these carries a life maintaining function. The bone marrow is a vital part of the human body. Every type of blood cell in the bone marrow begins as a stem cell. Stem cells are immature cells that are able to produce other blood cells that mature and function as needed. Stem cells are the most important cells needed in a bone marrow transplant. Stem cells, when transplanted, find their way to the recipient's marrow and begin to differentiate and produce all types of blood cells that are needed by the body.

A bone marrow transplant delivers healthy bone marrow stem cells into the patient. It replaces bone marrow that is either not working properly or has been destroyed (ablated) by chemotherapy or radiation.

Bone marrow is the soft, fatty tissue inside your bones. Stem cells are immature cells in the bone marrow. Some stem cells grow into different parts of your blood. These parts are:

1. Red blood cells (which carry oxygen to your tissues)
2. White blood cells (which fight infection)
3. Platelets (which help your blood clot)

What is a Bone Marrow Transplantation?

Bone marrow transplantation (BMT) is a special therapy for patients with cancer or other diseases which affect the bone marrow. A bone marrow transplant involves taking cells that are normally found in the bone marrow (stem cells), filtering those cells, and giving them back either to the patient they were taken from or to another person. The goal of BMT is to transfuse healthy bone marrow cells into a person after their own unhealthy bone marrow has been eliminated.

Why Transplant?

Bone marrow transplantation is used in a treatment of hereditary blood disease, hereditary metabolic disease, hereditary immune deficiencies and various

forms of cancer such as leukemia, lymphomas and myelomas that affect the bone marrow.

You may have a Bone Marrow Transplant if:
Cancer is in remission (the symptoms go away and the disease is under control but not necessarily cured)
Cancer relapses (returns) after initial treatment
Cancer has not responded to other treatment
Types of Bone Marrow Transplant
Allogeneic: The stem cells are collected from the blood or bone marrow of a related (brother or sister) or unrelated donor.
Autologous: The stem cells are collected from the blood or bone marrow of the patient prior to high-dose therapy and are stored until time of transplant.
Syngeneic: The stem cells are collected from the blood or bone marrow of an identical twin.

Procedure of Bone Marrow Transplant: Bone marrow transplant patients are usually treated in specialized centers and the patient stays in a special nursing unit (a bone marrow transplant unit) to limit exposure to infections. The hospitalization period is from 4 to 6 weeks, during which time the patient is isolated and under strict monitoring because of the increased risk of infection and/or bleeding. Donated bone marrow must match the patient's tissue type. It can be taken from the patient, a living relative (usually a brother or a sister), or from an unrelated donor. Donors are matched through special blood tests called HLA tissue typing. Bone marrow is taken from the donor in the operating room while one is unconscious and pain-free (under general anaesthesia). Some of the donor's bone marrow is removed from the top of the hip bone. The bone marrow is filtered, treated, and transplanted immediately or frozen and stored for later use. Then, transplant material is transfused into the patient through a vein and is naturally transported back into the bone cavities where it grows to replace the old bone marrow.

Alternatively, blood cell precursors, called stem cells, can be induced to move from the bone marrow to the blood stream using special medications. These stem cells can then be taken from the bloodstream through a procedure called leukapheresis. The patient is prepared for transplantation by administering high doses of chemotherapy or radiation (conditioning). This serves two purposes. First, it destroys the patient's abnormal blood cells or cancer. Second, it inhibits the patient's immune response against the donor bone marrow (graft rejection).

Following conditioning, the patient is ready for bone marrow infusion. After infusion, it takes 10 to 20 days for the bone marrow to establish itself. During this time, the patient requires support with blood cell transfusions.

Risks of Bone Marrow Transplantation: There are many very serious risks and side effects to a bone marrow transplant.

1. Serious bleeding
2. Infection
3. Liver problems
4. Skin rash
5. Diarrhea
6. Infertility or sterility
7. Cataracts
8. Muscle spasms
9. Leg cramps
10. Numbness in your arms and legs
11. Secondary cancers - the transplant procedure increases the risk of developing another cancer.

Another possible problem is that cells from a donor might not match your cells well enough and the new cells can begin attacking your cells. This is called graft versus host disease. This can be a serious problem, but it also can help to cure the cancer because the new cells also will attack any cancer cells that are left.

Pancreas Transplantation

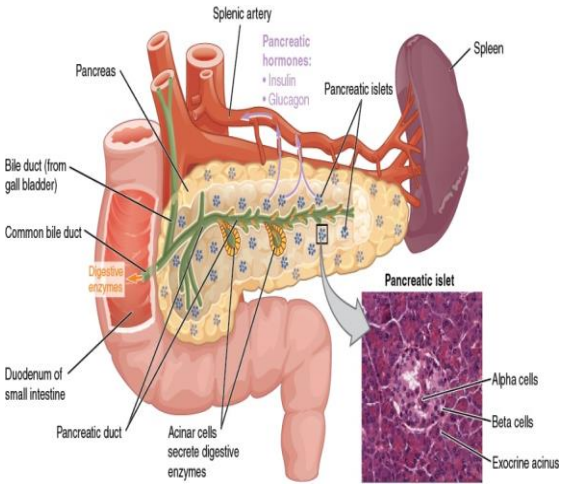


Fig. 6: Human Pancreas

Introduction

A pancreas transplant is a surgical procedure to place a healthy pancreas from a donor into a person whose pancreas no longer functions properly. Almost all pancreas transplants are done to treat cases of type 1 diabetes. Your pancreas is an organ that lies behind the lower part of your stomach. One of its main functions is to make insulin, a hormone that regulates the absorption of sugar (glucose) into your cells. Type 1 diabetes results when your pancreas can't make enough insulin, causing your blood sugar to rise to dangerous levels. The side effects of a pancreas transplant can be significant, so pancreas transplant is typically reserved for those who have serious diabetes complications. A pancreas transplant is often done in conjunction with a

kidney transplant. Your pancreas is a narrow organ, about 6 inches long, that lies behind the stomach. The pancreas produces a hormone called insulin that regulates the amount of sugar in the blood. It also makes enzymes that are released into your small intestine and help to digest food. Failure of your body to regulate the amount of glucose in your blood causes Diabetes. In Type 1 Diabetes the pancreas produces little or no insulin. In Type 2 Diabetes, your pancreas produces insulin but your body is not able to utilize it efficiently.

Goals of Pancreas Transplantation: Insulin independence with normal or near normal blood sugars. Prevention of the development and/or progression of the long term complications of diabetes. Improved quality of life, elimination of dietary restrictions.

Signs and Symptoms: The pancreas, located below your liver and under your stomach, is about seven inches long and weighs about 3.5 ounces. It has two main functions the first is to help digest food by making and releasing enzymes in the upper portion of the small intestine. Carbohydrates, fats and proteins are broken down into small parts that the body uses as nourishment. In addition, the pancreas makes large amounts of sodium bicarbonate, which can make the contents of the stomach less caustic or acidic as they flow through the small intestine. Sodium bicarbonate also helps keep fluids in the body and prevent dehydration. The other job of the pancreas is to make insulin, a hormone necessary for the body to use carbohydrates properly. If you don't produce insulin, you have a disease called diabetes.

A pancreas transplant can help manage the organ damage that may result from insulin-dependent diabetes. A successful pancreas transplant will eliminate the need for insulin injections, reduce or eliminate dietary and activity restrictions due to diabetes, and decrease or eliminate the risk of severe low blood sugar reactions

Pancreas Surgery: Pancreas transplant surgery is more complex and extensive than a kidney transplant. The pancreas transplant is placed intra- abdominally through a vertical mid-line incision about 8 inches long, as opposed to a kidney which is placed in the retro peritoneum (behind and outside your peritoneum). SPK surgery will last about 5-8 hours and a PAK or a PTA surgery usually takes 3-5 hours. The new pancreas is transplanted with a portion of small intestine which drains the digestive enzymes of the pancreas. This will need to be connected to your small intestine or your urinary bladder to provide a drainage for the enzymes. At We Care India partner hospital we prefer the former method as it is more physiological and does not harm your bladder. Your own pancreas will not be removed during the surgery.

Islet Cell Transplantation: Transplant options for the diabetic recipient include whole organ pancreas and islet transplantation. Islet transplantation offers the advantage of being less invasive than whole organ transplantation. However, current experience shows that multiple transplants are required and long-term function remains poor. Early successes with single donor islet transplants were encouraging but insulin independence is usually not sustainable

Cord Blood Stem Cell Transplant

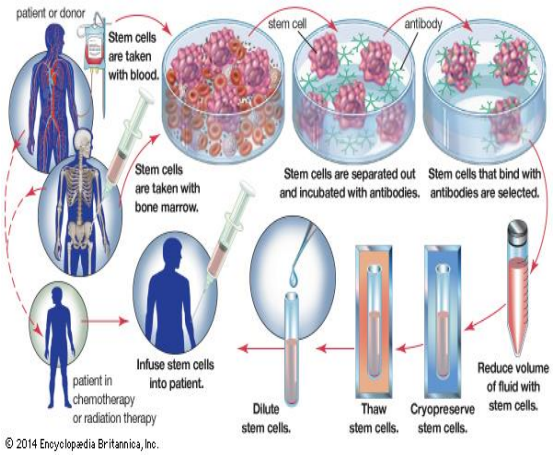


Fig. 7: Human Blood Stem Cell

Introduction

Stem cells have a remarkable capability to divide persistently and differentiate into different types of cells present in our body. From red blood cells, white blood cells and platelets to bone, cartilage, fibrous connective tissue, and fat, stem cells have the ability to form each and every type of cell present in the body. Although stem cells can be produced in other ways, in adults, bone marrow is the primary source of stem cells. At times, certain cancers, diseases or disorders can cause bone marrow to stop performing their normal functions. As a result, adequate numbers of healthy stem cells are not released into the body thereby preventing the formation and production of new and healthy blood cells. With the loss of healthy blood cells comes the body's inability to protect itself from various types of infections and diseases. In such a scenario, a stem cell transplant becomes essential.

What is Stem Cell Transplant?

Stem cell transplant is an intricate procedure in which healthy stem cells are infused into the body to replace damaged stem cells. Before introducing the healthy stem cells, the patient is given high dose chemotherapy to destroy all the diseased, as well as normal blood-producing, stem cells in the bone marrow. When the new stem cells are introduced into the body of the patient, they travel all the way to the

bone marrow via the blood stream and replace the destroyed stem cells. Gradually, these new stem cells start dividing and differentiating into different types of body cells, helping to rebuild a healthy immune system.

Where Do the Stem Cells for Stem Cell Transplant Come From?

Stem cells for stem cell transplant come from four primary sources:

1. **Umbilical Cord Blood**: Until recently, the umbilical cord was considered to be waste material and was discarded soon after birth. Nowadays, many parents choose to drain their newborns umbilical cord blood in order to preserve the valuable cord blood stem cells that are contained within this blood. Obtaining stem cells from the umbilical cord poses no risk either to the child or the mother. When a parent decides to bank her child's cord blood, she generally has two options: to preserve the stem cells at a private bank for the family's own use or to donate the cord blood stem cells to a public bank, where the stem cells may be used for research or given to a patient who requires it urgently.
2. **Bone Marrow:** For harvesting the stem cells from the bone marrow, the donor is given anaesthesia (general or local) and the marrow is drawn out of the hipbone or breastbone through a needle. The entire process takes about one hour. However, it does require that the donor be hospitalized for a few days. There are no major risks associated with bone marrow donation except the common uncertainties related to anaesthesia. There may be some stiffness or soreness in the area from where the bone marrow has been extracted. For a few weeks the donor may feel tired. The recovery period varies from a few days to three to four weeks.
3. **Peripheral Blood**: For retrieval of stem cells from the peripheral blood, the donor is first administered medications for about four to five days to increase the number of stem cells in his blood. Next, a process known as apheresis, whereby blood is drained from a vein in the arm, is performed. The withdrawn blood goes into a machine where the stem cells are removed. The blood then flows back into the donor minus the removed stem cells. Apheresis requires one to three session, lasting approximately four to six hours each, in order to collect enough stem cells. For the extraction of stem cells from the peripheral blood, no anaesthesia is given to the donor, therefore the donor is not exposed to any risks arising from anaesthesia. However the medications given to increase the number of stem cells may produce side effects including nausea, headache, fatigue, muscle and bone pain, and difficulties sleeping. These automatically disappear within two to three days of the last dose of medication.
4. **Embryo**: The fourth source of stem cells is the embryo. For the extraction of these stem cells, an egg is fertilized in vitro. When the fertilized egg has developed for four to five days (the blastocyst stage), the stem cells are retrieved.

Although stem cells derived from embryos have a greater capacity than any other type of stem cell to differentiate into other types of body cells, due to ethical reasons, this source of stem cells is seldom used.

Stem Cell Transplant can be divided into Three Types

1. Autologous stem cell transplant: in which healthy stem cells are retrieved from the individual's body and given back to him.
2. Allogeneic stem cell transplant: where stem cells given to the patient are either donated by an immediate family member or an unrelated person.
3. Syngeneic stem cell transplant: whereby stem cells come from the identical twin of the patient. Besides these three basic types of stem cell transplant, two other types of stem cell transplant exist. However, they are still in the clinical trail stage.
4. Tandem autologous transplant: where the patient undergoes two autologous stem cell transplant within a span of six months.
5. Mini allogeneic (non-myeloablative) stem cell transplant: in which the patient undergoes a less intense conditioning process before an allogenic stem cell transplant.

Additionally, adults receiving an allogeneic cord blood stem cell transplant have the unique option of using stem cells from two different donors. While this method is not widely practiced, it has been used successfully in a handful of stem cell transplants.

Can Stem Cells from any Donor be given to a Patient?

On the surface of our body cells, there are special sets of proteins called human leukocyte associated antigen or HLA-antigen. The more closely the HLA-antigens on the donor's stem cells match with those on the recipient stem cells, the higher the probability of an allogeneic stem cell transplant being successful. However, if the HLA-antigens are not properly matched, then the recipient's body may reject the donor's stem cells. The result of the rejection is the development of graft vs. host disease or GVHD. There are three different pairs of HLA-antigens that a patient needs to be matched on for a total of six antigens. Patients receiving a bone marrow transplant will need to find a donor that is a perfect match, that is a 6/6 HLA match. On occasion, a transplant may be done even if the recipient is a 5/6 HLA match. Individuals receiving a cord blood transplant, though, can use stem cells from someone that is only a 4/6 HLA match. This is because

cord blood stem cells are more immature than bone marrow stem cells and therefore less likely to cause GVHD. However, GVHD is not an issue with regards to autologous or syngeneic stem cell transplant. In the case of the former, the stem cells used for transplantation are derived from the patient himself, while in the case of the latter the stem cells are derived from the identical twin of the patient who has the same genes and the same HLA-antigens.

How is a Patient Prepared for a Stem Cell Transplant?

Before a stem cell transplant, several tests are performed to assess the overall health and condition of the patient. In addition to these tests, an intravenous catheter may be surgically inserted into a main vein in your chest, up towards your neck. During the duration of the treatment, this catheter will be used for chemotherapy, to infuse the stem cells, for any blood transfusions and even for providing nutrition. Once the tests have been performed and the intravenous catheter has been inserted, the conditioning session begins. This involves high-dose chemotherapy and total body irradiation (TBI), which are performed in order to destroy the damaged stem cells and suppress the immune system (so as to reduce the chances of stem cell rejection). The type of conditioning process administered to the patient generally depends upon her overall health, type of disease and the type of stem cell transplant therapy selected for her. Irrespective of the type, the conditioning process is typically associated with numerous side effects, including:

Side Effect:

1. Nausea and vomiting
2. Hair loss
3. Diarrhea
4. Mouth ulcers
5. Fatigue
6. Anaemia
7. Cataracts
8. Increased risk of organ failure
9. Premature menopause
10. Bleeding
11. Infertility
12. Development of secondary cancer
13. Death

What Happens After the Stem Cells Have Been Infused in the Patient?

Upon entering into the blood stream, the stem cells reach the bone marrow and, after a short time, begin producing new blood cells. This process is known as engraftment, which may take about two to four weeks. However, the immune system takes approximately one to two years to recover completely. Depending upon the treatment procedure, the patient may be required to stay in the hospital for at least three to five weeks or until her blood count becomes normal. Sometimes patients who have undergone stem cell transplant are asked to stay close to the hospital for the next three to four months for close monitoring. For several weeks following a stem cell transplant, doctors perform different tests to determine whether the newly implanted stem cells are producing new blood cells or not. During this phase, bone marrow aspiration (where a small amount of bone marrow is withdrawn with the aid of a needle and examined under a microscope) may also be performed by doctors to ascertain how well the new bone marrow is functioning. Although stem cell transplant is associated with many complications in addition to long-term and short-term side effects, it has the potential to cure a large number of congenital as well as acquired diseases. While it is beneficial to evaluate the pros and cons of a stem cell transplant before opting for it, it is important to remember that, after a successful stem cell transplant, the chances of reoccurrence of disease is greatly minimized. The majority of people who have undergone a stem cell transplant are able to lead a completely normal life afterwards.

Skin donation/ Transplantation:

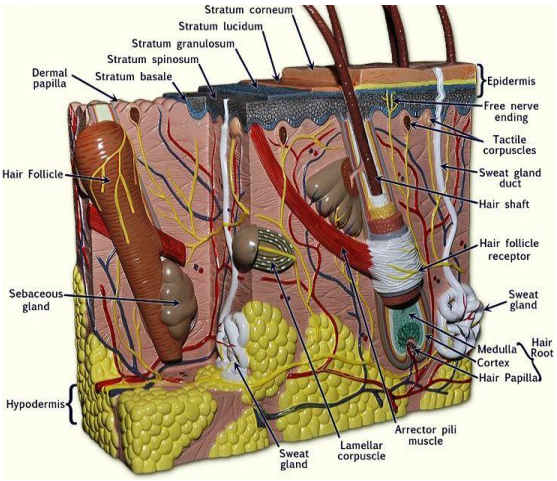


Fig. 8: Human Skin Transplant

Donating your skin after death saves life of at least 2 burnt patients. More than 700 families have taken interest and donated skin post-death of their near ones (as of July 2013).

How can you donate skin?

1. Only a thin layer of skin from thigh and back is taken.
2. No Disfigurement! No Bleeding!
3. No blood matching is required.
4. One can donate skin upto 24 hrs of death.
5. Call our Helpline No:- 9820075645, 9821523076, 9821119451
6. LTMG (Sion) Hospital's doctor's team will come within 2 hours of your call

7. Skin will be harvested in about 45 minutes.
   Skin bank

Who can donate Skin?

1. A person above 18 yrs of age.
2. Not having transmissible diseases, like hepatitis, HIV, Skin Cancer or Skin diseases.
3. Even an old person with wrinkled skin can donate.
4. Age is no bar, even person 102 years old has donated skin.

Why Skin Donation?

1. Skin is usually donated to Burns, Diabetic, Trauma patients.
2. It resurfaces the exposed body and prevents the entry of bacteria.
3. Controls the loss of protein, heat and fluid from the body.
4. Gives the patient enough time to develop his own skin and get a new life.
5. The applied skin becomes a biological bandage for the patient.

Tissue Donation Facts:

1. Every death referred to One Legacy is evaluated as a potential tissue donor.
2. One tissue donor can enhance and save over 50 people.
3. Over 1,000,000 people are helped annually with tissue transplantation.
4. Skin is one of the tissues recovered for transplantation and many hospitals utilize skin or various procedures.
5. An open casket funeral is possible after tissue donation.

Skin Recovery:

1. Skin recovery takes 1-1.5 hours.
2. Skin is recovered from larger surface areas, such as the back and thighs.
3. Skin will be recovered as either a thin layer (partial-thickness) or a full-thickness skin graft. The thin layer includes the epidermis layer and a small percentage of the dermis and the full-thickness includes all 3 layers of the skin and can include some subcutaneous fat.
4. With full-thickness grafts the body will heal faster and with less pain in certain surgeries.

Skin Storage:

1. Skin can be stored fresh for up to 14 days
2. If skin is cryopreserved within 72 hours of recovery and maintained at - 70ºC, it can last upto 5yrs

Skin Usage:

1. Skin for skin-grafts need not be matched to the recipient as it sloughs off once the pt's skin regenerates.
2. Burns - Increases burn survival by 17% to 77%, promotes healing of pt's own skin, provides a temporary coverage to protects against infection and loss of fluid and heat, decreases pain.
3. Abdominal wall reconstruction- i.e. hernia repairs.
4. Breast reconstruction-post-mastectomy. Promotes rapid revascularization, white cell migration and cell repopulation, supporting tissue regeneration and ultimately transforming into host tissue.
5. ENT surgeries- e.g. facio-maxillary reconstruction, parotidectomy, injection laryngoplasty.
6. Tunneling ulcers-use of particulate acellular dermis-a processed form of skin, infected into the tunneling ulcer and promotes healing and closure of the ulcer.

Risks of Skin Transplant: Bleeding, infection, loss of grafted skin, nerve damage, graft-vs-host disease

Skin transplant example: A police officer who slipped and fell in the shower and lay under the scolding hot shower for hours, developed 3rd degree burns. He received a processed dermal graft derived from full-thickness skin grafts to his back/ shoulder. 2.5 years post-skin grafting, the burn has fully healed and the patient has regained full range of motion

Questions & Answers about Organ and Tissue Donation and Transplantation

There are over 115,000 people in the United States depending on a life-saving organ transplant. Donated tissue prevents infection in burn victims, replaces bone devastated by cancer or injury, and restores sight to the blind**.** One registered donor can save and improve the lives of more than 50 people

What is the Donor Registry?

When you register as a donor, the information you provide is entered into a database that can only be accessed by a federally designated Organ Procurement Organization (OPO) and is only used for determining a donation decision. The professionals, who are responsible for your medical treatment, including hospital staff and Emergency Medical Technicians, do not have access to this confidential information. Joining the Donor Registry is first person consent for donation.

What is first person consent?

The purpose of the Donor Registry is to support your decision to give the gift of life. If you are a registered donor, you have given your consent to donate

organs and tissues. The Uniform Anatomical Gift Act (UAGA), a law that gives individuals the right to donate organs and tissues, protects an individual's donation decision.

I'm not 18 years old, can I still register as a donor?

In Connecticut, all drivers are asked if they would like to join the donor registry when they receive their driver's license. At age 16-17, Connecticut residents can register their intent to donate. Prior to age 18, the final decision about donation would be made by the legal next of kin. At age 18, registering as a donor is first person consent. Please remember that, prior to age 18, you are empowering your family member to make an informed decision about donation.

What are OPOs?

Organ procurement organizations, are non-profit, federally designated organizations that facilitate the organ and tissue donation process. OPOs are responsible for honoring an individual's decision to donate when they have joined a donor registry and providing compassionate support to families. OPOs also evaluate potential donors for medical suitability, assist with the placement of organs for transplant, and facilitate the recovery of both organs and tissues.

What does "Routine Notification" mean?

All hospitals are required by federal law to contact their local OPO when a patient dies. When the hospital calls, OPO staff will consult the Donor Registry and determine if the individual is medically suitable to donate. This referral process is in place to honor the rights of registered donors and to ensure that a family is able to make a decision about donation when their loved one has not documented their wishes.

What is brain death?

When the brain is injured, it responds like other injuries—it swells. However, the brain is confined within the skull and has no room to expand. This results in death. Brain death is the complete and irreversible cessation of all brain function. Standards for the determination of brain death are very strict, and death based on the absence of brain function is legally recognized in every state. Brain death can occur following a catastrophic brain injury, such as a brain aneurysm or severe trauma to the head. Even though the heart and lungs continue to function temporarily with artificial respiratory support so they are suitable for transplant, there is no chance for recovery because the patient is dead.

What can be donated?

Organs that may be donated after death include the heart, liver, lungs, kidneys, pancreas, and small intestine. Tissues that can be donated include corneas, skin, bone, heart valves, connective tissue and blood vessels.

How are recipients matched to donor organs?

People waiting for transplants are listed at their local transplant center and on a national waiting list maintained by the United Network for Organ Sharing (UNOS). UNOS is responsible for overseeing organ placement and providing fair and equitable placement of donated organs. When an organ becomes available, several factors are taken into consideration. These factors include blood and tissue type and size of the donor and transplant candidate and the candidate's medical condition, time spent on the waiting list, and urgency of need. Geographic location is also a factor, as timing is critical and transportation times must be kept to a minimum.

If the hospital knows that I am a donor, will they work as hard to save my life?

Absolutely! The primary goal of the hospital staff and Emergency Medical Technicians is to save your life. The team that is responsible for your care is solely focused on doing everything possible to help you. In fact, the individuals responsible for the recovery of organs and tissues are not notified until after it has been determined that all efforts to save a life have been exhausted.

Is there any cost to the donor or their family for organ and tissue donation?

No. Neither the donor nor their family pays for or receives payment for organ or tissue donation. All costs directly associated with donation are paid by the OPO.

Does organ and tissue donation leave the body disfigured?

No. The removal of organs and tissues is performed by qualified doctors and recovery staff in a sterile environment. All donors are treated with respect and care during the entire recovery process. Organ and tissue donation does not interfere with an open-casket viewing

Do most religions support organ and tissue donation?

Most religions view donation as the ultimate act of charity and an unparalleled gift of generosity and compassion. For specific religious beliefs, please visit the Donate Life New England website at www.donatelifenewengland.org.

Is registering through Donate Life New England similar to signing up to be a donor on my driver's license?

Yes. Registering with Donate Life New England is simply one more way to make your donation wishes

known. Many donors may even wish to register through both Donate Life New England and their state motor vehicle office. However, if you register in both places and change your mind about donation, be sure to remove yourself from both donor registries as well.

Where can I get more information?

Please contact Caitlyn Bernabucci, Public Education Specialist, LifeChoice Donor Services, Windsor, CT at 860-286-3120 or info@lifechoiceopo.org.

Transplantation Hospitals:

The list of world class heart hospitals in India is as follows:

1. Apollo Hospitals, Bangalore, India
2. Apollo Hospital, Chennai, India
3. Apollo Hospitals, Hyderabad, India
4. Indraprastha Apollo Hospital, Delhi, India
5. Apollo Gleneagles Hospital, Kolkata, India
6. Wockhardt Hospital, Bangalore India
7. Wockhardt Hospital, hyderabad, India
8. Wockhardt Hospital, Mumbai, India
9. Fortis Hospital, Delhi, India
10. Fortis Hospital, Mohali, India
11. Fortis Hospital, Noida, India
12. Escorts Heart Institute Hospital, Delhi, India
13. Narayana Hrudayalaya Heart Hospital, Bangalore, India
14. Artemis Hospital, Gurgaon (Delhi) , India
15. Max Devki Devi Heart and Vascular hospital, Delhi, India
16. BGS Global Hospital, Bangalore, India
17. BGS Global Hospital, Chennai, India
18. BGS Global Hospital, Hyderabad, India

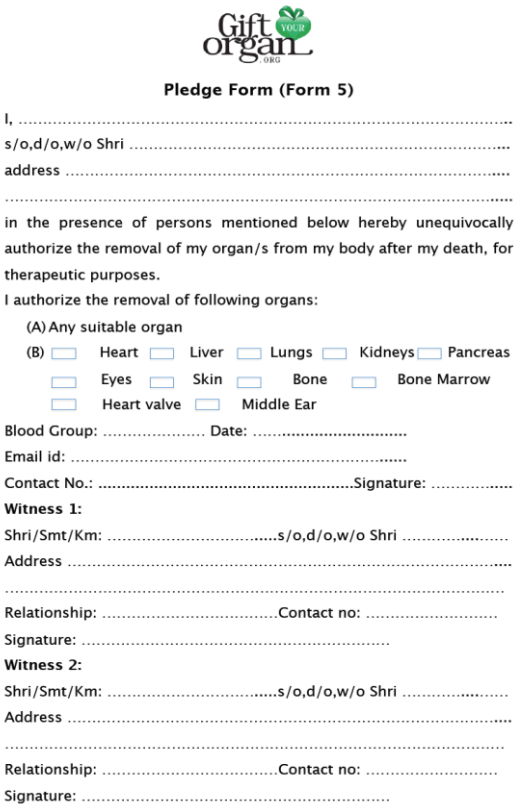
The list of Kidney Transplant Hospitals in India is as follows:

1. Apollo Hospitals, Bangalore, India
2. Apollo Hospital, Chennai, India
3. Apollo Hospitals, Hyderabad, India
4. Indraprastha Apollo Hospital, Delhi, India
5. Wockhardt Hospital, Mumbai
6. Wockhardt Hospital, Kolkata
7. Fortis Hospital, Mohali, India
8. Fortis Hospital, Noida, India
9. Artemis Hospital, Gurgaon (Delhi) , India
10. BGS Global Hospital, Bangalore, India
11. BGS Global Hospital, Hyderabad, India

The list of of Liver Transplant Hospitals in India is as follows:

1. Apollo Hospital, Chennai, India
2. Indraprastha Apollo Hospital, Delhi, India
3. Wockhardt Hospital, Mumbai, India
4. Fortis Hospital, Noida, India
5. Narayana Hrudayalaya Heart Hospital, Bangalore, India
6. BGS Global Hospital, Hyderabad, India

Organ Donation Form



Pledge Form (Form 5)

I, ...

s/o,d/o,w/o Shri .....

address .....

.....

in the presence of persons mentioned below hereby unequivocally authorize the removal of my organ/s from my body after my death, for therapeutic purposes.

I authorize the removal of following organs:

(A) Any suitable organ

(B) ☐ Heart ☐ Liver ☐ Lungs ☐ Kidneys ☐ Pancreas

☐ Eyes ☐ Skin ☐ Bone ☐ Bone Marrow

☐ Heart valve ☐ Middle Ear

Blood Group: ..... Date: .....

Email id: .....

Contact No.: .....Signature: .....

Witness 1:

Shri/Smt/Km: .....s/o,d/o,w/o Shri .....

Address .....

.....

Relationship: .....Contact no: .....

Signature: .....

Witness 2:

Shri/Smt/Km: .....s/o,d/o,w/o Shri .....

Address .....

.....

Relationship: .....Contact no: .....

Signature: .....

Conclusion

In recent years, the science of organ transplantation has gotten better. Unfortunately, there are not enough organ donations for everyone who is in need. Organdonors are needed to save thousands of lives every year. Agreeing to donate organs does not affect the quality of care a person receives. Transplantation processes start only after the donor is no longer living. The decision to donate organs is yours. If you decide to become an organ donor, put it in your advance health directives and make sure your family and health care agent know about your decision.

So, please reregister your name for organ donation. Helps people who can need of organ. And the save the life

Conflict of Interest: None

Source of Support: Nil

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3. Gift Your organ: http://giftyourorgan.org/
4. Gift a Life: http://giftalife.org//

5. For any queries regarding organ donation, please call - 1800 4193737 (Toll free by MOHAN Foundation).
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