

Organ Donation: A Precious Gift for Second Life

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Abstract: *Introduction:* Human organ transplantation represent one of best example of scientific achievements of medical science. Organ transplantation is a gift of second life for thousand peoples of the world. It is very difficult and impossible thing for living individual who can donate their organ itself. Rarely very close relative or family members of needed person (organ recipient) donate his/her organ. But if person just after his /her death can donate their organ then it is possible to save many other lives .So for this purpose Government make rules and act that if individual just prior to his /her death or family members of patient just after death of their loving one ,wants donate patient's organ then can donate organ lawfully. Brain-dead patients can be potential source for this purpose. **Aim:** By This article we try to awake awareness in general population. This article reviews the current rules and Act related to organ donation program in India. Organ donation means donating organ or biological tissue to a need full person (living recipient). **Result:** The transplanting organ of dying patients can save life of thousands peoples and also organ of dead patient survive or live even after his /her death. It is also a precious gift for loving ones of dead patient.

Keywords: Organ transplantation, Organ donor, organ recipient, brain death, Organ donation Act.

1. Introduction

Organ transplantation is one of the greatest medical gift of 20th century, which can gave new life of thousands people /patients in all over world .Act of organ donation is a golden sign of humanity. Transplantation of organ in a critically ill patient is a 'Life saving gift' giving by the organ donor. So organ donor is just like an angel .

Disparity between more demand of organs and their poor supply is major problem.

Global issue – shortage of organ

Major solution – deceased Organ donation.(Organ donation by a brain dead) .

1st attempt to use a cadaver donor organ (kidney) was undertaken in 1965 in India (In Mumbai)¹.

1st kidney transplantation in India was done in 1970.

1.1 Laws and rules Governing Organ Transplantation

Transplantation of human organ Act (THOA) 1994², Act allows organ donation and legalized concept of brain death. Aim of Act- regulation, removal, storage, & transplantation of human organs for therapeutic purposes and for prevention of commercialization of human organs.

Human organ donated by the unrelated deceased donor is legal with acceptance of brain death.

1.2 Who can donate organ?

Both living and nonliving person.

a) Living

- Living related donation (brother, sister, son, daughter, grandson)

- Living unrelated donation (friend, in-law, neighbors)
- b) Nonliving person /Deceased cadaver donation- brain-dead person /after cardiac death.

1.3 What is brain-death?

Brain-death: irreversible end of brain activity.

Occurs due to

- 1) A major head injury –As in road traffic accident.
- 2) Brain stroke or bleeding in a brain.

Total number of road traffic accident reported in india in 2013 was more than 1lac .It is 1.1% of world's total death³. Approximately 40-50 % death in road -traffic accident occur due to head injury . These patient are brain dead. Head injured Patient from road -traffic accident alone are sufficient to meet demand of potential organ donors in our country .

Brain dead person are kept on ventilators to provide oxygen to organs and main tend a circulation, so organ remain healthy. In India the recognize brain death is a legal form of death⁴. A brain death /brain stem dead person can donate 8-10 organs. The Brain death is NOT a coma .

Coma: Coma is a state of deep unconsciousness where a person became sleepy with no movement of body part. Person can breath on his /her own , without help of a ventilator means brain is still functioning. In coma brain has a capacity to heal. Person will not be declared brain dead if there is some activity in brain.

Brain Death: Brain death is irreversible and permanent cessation of all brain functions .In a patient with brain death, individual can not sustain his own life but body's vital functions may be maintained in an 'intensive care unit' for a short time period .

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In India panel of 4 doctor need to declare a person as a brain dead harvesting before his /her organs .This declaration done after a series of exhaustive tests –

- 1) Cornea reflex test
- 2) Ear reflex test
- 3) Gag reflex test
- 4) Apnea reflex test

These test are repeated twice in a time frame of 6 hours.

The panel must include –

- 1) Medical administrators in charge of hospital.
- 2) An authorized specialist.
- 3) A Neurologist / Neurosurgeon.
- 4) A Medical officer treating the patient.

According to Dr. Anil Kumar (program officer for National organ transplant ,program running under Directorate General of Health services ,Ministry of Health & Family welfare.) .A brain dead patient can donate organs –

- 1) Two kidney
- 2) One liver (it can be subdivided into 2 parts).
- 3) Two lungs
- 4) Heart
- 5) Small Intestine
- 6) Pancreases

Challenge: It is very difficult for Family members that their loved one become dead , because brain-dead patient look likes sleeping on a life support system. Patient's Body is warm on touch and heart has beating so it is very difficult for a doctor to convince family members to donate organs of their brain dead loved one.

1st challenge is red- tapism and lengthy paper work .According to existing rule, if potential donor is not related to organ recipient needs to be approved by a state –level committee or by a hospital committee .

Also find out a match organ recipient is difficult.

Difficulty:

- 1) Limited surgeons and hospitals equipped for organ transplantation.
- 2) Ventilators for preserving the organs of a brain –dead patient is pre-requistes.
- 3) ICU personnel who manage such situation should be perfectly trained.

2. Organ -Donation After Cardiac Death-

According to *Bardale*⁵ alternative form of Cadaveric donor 'Non-heart beating donor' (NHBD) or organ donation after cardiac death .In these patient heart –beat and blood circulation has ceased . Patient's Body is cold on touch and heart has no beating so it is very easy for a doctor to convince family members to donate organs of their dead loved one .In NHBD organs should be removed instantly (prior to lost organ's viability) for transplantation.

In the med -1990s there was a resurgence of interest and acceptance in western countries using organs from NHBD. In 1995 'Maastricht classification' put forward for transplant by a NHBD.

Implementation such donation specially in 'Indians' will need both social and cultural acceptance⁶.It will also need trained medical team immediately who can remove organ almost instantly in a planned manner.

But families who want donate organ by consent easily understood and accept that patient become die⁷ and decision for organ donation take very fast ,whereas in brain –dead patient family cannot understand and accept that patient become die and decision for donation very is very difficult .

3. How Can I Donate Organ?

For deceased organ donor written consent form by law-full is pre-requisite .

Living organ donor fill consent form by downloading a form by NOTTO (National organ & tissue transplant organization).A 'donor card' is issued with a registration number which show your willingness for donate .

One can register for organ donation at the NGOs listed below –

- 1) MOHAN Foundation: <http://mohanfoundation.org/>
- 2) Gift a life: <http://giftalife.org/>
- 3) Shatayu: www.shatayu.org.in
- 4) Gift your organ: <http://giftyourorgan.org/>
- 5) Narmada Kidney Foundation
- 6) Official government website- <http://www.organdonor.gov>

Organ Donation Form

ORGAN RETRIEVAL BANKING ORGANISATION (ORBO)
ALL INDIA INSTITUTE OF MEDICAL SCIENCES
ORGAN DONOR FORM

Date _____

Regd. No. _____

I,son / daughter / wife of.....in the hope that I may help other hereby make this anatomical gift, if medically acceptable, to take effect upon my brain death. I hereby wish to donate the following organs.

Hearts, Lungs, Kidneys ,Liver, Cornea &

My blood group is

Special wishes, if any

Signed by the donor in the presence of two witnesses:

Signature of donor with date

Date of birth of donor

Address of the donor

Telephone No.....

_____ Witness

_____ Witness

ORBO

Organ Retrieval Banking Organization
 All India Institute of Medical Sciences
 Ansari Nagar, New Delhi-110029
 1060 (Special 24 hrs. helpline)
 26588360 26593444

Organ donation is a family decision . Therefore, it is important that donor discuss her / him decision with family members and loved ones so that it will be easier for them to follow through with her / him wishes.

Three things – we can do

- 1) Register decision of organ donation.
- 2) Inform and discuss with family member about organ donation.
- 3) One should Always keep ‘organ donor card’ in wallet .

Healthy organs should be transplanted as soon as possible from donor to recipient .Tissue may be removed within 12-24 hours after brain-death

One organ donor can donate upto25 different organs and tissues for transplantation. This can save 9 lives.

For any queries related to organ donation one can call at 18004193737 (Toll free number

By MOHAN Foundation). MOHAN Foundation is a NGO based in Tamil-Nadu and Andhra-Pradesh.

Donated organs are then given to recipients (person in need of organ) registered on registry of transplant recipient based on position in waiting list. <http://www.organindia.org/information> for receipts or on www.organdonor.gov/about/process/matching.html

Organ Recipient – Person in which organ transplantation done .A transplant means a second chance of life .Any Vital organs such as heart, pancreas ,liver ,kidneys ,lungs can be transplanted in place of failing organ .It allows recipients to return a normal lifestyle ;as in a blind person cornea transplantation give ability to see.

Organ Recipients are of 2 types

- 1) Patient requires an elective transplant. As the patient who is on dialysis and waiting for a kidney transplant .These patient undergo HLA typing and blood-group matching with organ donor.
- 2) Patient requires an emergency transplant . As the patient who has a failing heart . These patient undergo only blood-group matching with organ donor.

Donated organs are being transported across cities and even states by maintain ‘green corridors’ that ensure traffic is

stopped in way by which organ is going to save vital minutes so that organ reached to recipient within time limit.

Organ transplantation matching criterion

- 1) Relative distance between recipient & donor.
- 2) Size of organ in need and blood typing.
- 3) Time duration awaiting transplant.

Factors considered before organ matching

- 1) Medical urgency of recipient.
- 2) Degree of immune system matching in between donor and recipient.
- 3) Whether recipient is an adult or a child .It has importance.

Organ Matching Process

- 1st step –Donate an organ.
- 2nd step -UNOS lists potential recipients.
- 3rd step -Notify transplant center about an available .
- 4th step -Transplant team processes organ for recipients.
- 5th step -Organ either accepted or rejected .

Organ Distribution Policy

First is try to distribute organs nearby (locally)but if there is no recipients then organs are regionally offered and if no one awaiting regionally then organ distributed nationally.

Organ can be donated by

- 1) Any one above 18 years of age.
- 2) Everyone became a potential organ and tissue donors after death .But If organ is donated after death a detailed medical assessment is done to decide which organ can be successfully donated.

Exclusion criteria

- Patient having infectious diseases, sepsis, contagious diseases ,HIV intra-venous (IV)drug user can not donate her /his organ or tissue.
- Most cancer patient can donate organs.
- Patient having Hepatitis C can donate organs only a patient who also have Hepatitis C .

Following organs can be transplanted –

- 1) Intestine
- 2) Heart & Lungs (both can be transplanted simultaneously)
- 3) Lungs(alone)
- 4) Heart(alone)
- 5) Liver (an be give to more than 1 recipients after subdivide liver)
- 6) Pancrease & kidney
- 7) kidney (alone)
- 8) Pancrease (alone)

Following Tissues can be transplanted –

- 1) Skin, cornea, bones, bone –marrow nerves brain heart–valve, ear-drum, ear-bones. A donor can donate – up to 100 year of age skin, cornea.
up to 70 year of age Heart ,Lungs
up to 40 year of age heart Valves

Organ must be removed as soon as possible after determination of brain death, meanwhile circulation maintained artificially

Organ must be transport in a standard ice-box from Donor hospital to Transplant center.

Picture of ice - box for organ transportation



Best hospital for multi-organ transplantation –

1. Apollo group of hospital
2. Max healthcare in India
3. Columbia Asia hospital –India
4. Continental hospital.

Cold Ischemia Time – Duration of time that an organ which are not receiving blood supply and maintained only on a cold preservation fluid .

Cold Ischemia Time is varies from organ to organ .The commonly accepted Cold Ischemia Time for different organs are listed below –

- Heart :- 4 hours
- Liver : - 6-10 hours
- Lungs :- 4-6 hours
- Pancreases :- 12-18 hours
- Intestine :- 6-12 hours
- Kidney :- 24 hours (may be maintained up to 72 hours ,if placed on mechanical perfusion)

Tissue such as cornea ,skin ,heart-valve and bones can also harvested and sterilized to store in a ‘Tissue -Bank’, These tissue could be used later for future transplant (for 5 years) and reconstructive surgeries.

Main Provision Act (Include Amendments & rules of 2014)⁹ are:

The amendment to the Act was passed by the Parliament in 2011 and rules were notified in 2014 .

- a) First of all identification of Brain death .
- b) Give- Certificate of brain death (Form 10).
- c) Allow transplantation of human organs or tissue from brain-dead /cadaveric donor or from living donor.
- d) Give power to Regulatory and advisory bodies for monitoring transplantation activity.

- 1) Appropriate Authority (AA) –It conduct regular inspections to examine quality of transplantation.)
- 2) Advisory committee – It is for giving advice to the Appropriate Authority.
- 3) Authorization committee (AC) – It regulate transplantation from living donor.

e) Living donor

- (i) A Near - Relative
- (ii) Non- Relative

Non- Relative living donor needs permission of Authorization committee established by state to donate his/her organs.

Swap transplantation –When a Near- Relative living donor is medically incompatible with the

Organ recipient (married couple),then pair is permitted to do a swap transplant with another related matched donor & recipient pair .

f) Authorization for organ donation after brain death –

- (i) May be given prior to death by individual itself.
- (ii) Authorization process for organ /tissue donation unclaimed bodies outlined.

g) Organ retrieval

Organ retrieval means removal from organ from donor. It is done in a hospital with ICU facility and registered as a retrieval center. It has temporary storage and has facility for their transport.

h) Cost of donor management

Organ retrieval, its transportation, its preservation is pay by organ recipient, government institution, NGO (Nongovernment organization), not by donor family.

- i) In Medico-legal case organ retrieval should be delay up to determination of cause of death.
- j) Facilities and Manpower for registration of a hospital as a transplant center is outlined.
- k) Infrastructure of hospital, equipment, guidelines, standard procedure for operation for tissue bank outlined.
- l) Qualification of surgeon which done transplant, cornea and other tissue retrieval technicians are defined.
- m) In all transplant center transplant coordinate should be must.
- n) All NGO (Nongovernment organization), Societies and trust working in field of organ retrieval ,storage, transplantation must need registration .
- o) Central Government of India established a National Human organs & tissue removal and storage net-work i.e. NOTTO & ROTTO.

NOTTO (National organ and tissue transplant organization)
Website - www.notto.nic.in.
ROTTTO (Regional organ and tissue transplant organization)
SOTTO (State organ and tissue transplant organization).

Manner of establishing national or Regional or State human organs and tissue removal and storage and their functions Networks.

P. Central government should maintain a registry of donors & recipients of human organs & tissue.

Q. For supplying organ if any receive payment then he give penalties.

VARIOUS FORM- outline in Act- are follows –

1. Form 1: Near Relative consent.
2. Form2: Spouse consent
- 3 .Form 3 : Other than Near Relative donor consent.
4. Form4 : Psychiatrist evaluation of donor
5. Form 5: HLA-DNA profile report
7. Form7: Self consent for deceased donation .
8. Form8 : consent for organ donation from family .
9. Form 9: consent for organ donation from unclaimed bodies.
10. Form 10 : Brain death Declaration Form
11. Form11 : Joint transplant application by donor / recipient
12. Form12: Registration of hospital for organ transplantation
13. Form13: Registration of hospital for organ retrieval
- 14 .Form16 : Grant of Registration
17. Form17 :Renewal of Grant of Registration.
18. Form18 :Decision by hospital authorization committee .
- 19 .Form19 : Decision by district authorization committee .
20. Form 20 :Verification of Domicile for non –relatives.
- 21 .Form 21 : Letter from Embassy.

Working guidelines for authorization committee .

- 1) Donor & recipient Tissue typing and other basic test.
- 2) Related Document of both donor & recipient ,birth certificate ,marriage certificate .
- 3) Identity card and residence proof ,voter card, passport card ,driving license ,PAN card ,ration card ,bank account and family photo of both donor & recipient .

IF non- relative (No genetic relation between donor & recipient)–

- 1) PCR (polymerase chain reaction) based DNA test method (Deoxyribonucleic Acid).
- 2) HLA Test (Human leukocyte Antigen)
- 3) Test for Human leukocyte Antigen –B alleles.

All Tests should be done in lab with NABL (National Accreditation Board for laboratories).

A RMP prior to removing a human organ from donor of brain death –

- 1) Form 8 (Form8 : consent for organ donation from family) has been signed by all members of Board of Medical Expert .
- 2) If donor after brain death is less than 18 year, Form 8 (Form8 : consent for organ donation from family) has been signed by all members of Board of Medical Expert and an authority as specified in Form 9 has been signed by parent of person.

Scoring System –Kidney donor profile index (KDPI) and Deceased Donor Score

KDPI was approved by organ procurement and transplantation network Kidney transplantation committee in 2013, for estimating risk of post –transplant kidney graft rejection from a particular deceased donor kidney in comparison to other kidney.

KDPI score include

- 1) Donor age
- 2) Donor height
- 3) Donor weight
- 4) Ethnicity
- 5) Serum creatinine level
- 6) History of hypertension ,diabetes ,hepatitis -c status
- 7) Cause of death .

Each kidney is scored in KDPI system from 0-100%. Higher score are accepted to have a minimal potential function of donor organ then with lower score ¹⁰.

Deceased Donor score was decided from 5 donor variables obtained at time of organ retrieval . creatinine clearance (0-4 points) ,history of hypertension (0-4 points),HLA mismatch (0-3 points) ,donor age (0-25 points) and cause of death (0-3 points)-

Total number of point –(0-39) .

A grade (A-D) was then assigned to specific deceased donor based on his /her total score. Greater than 20 points or grades C & D are defined as marginal donor with a much shorter potential function of donor organ.¹¹

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