

ORGAN DONATION: A GIFT OF LIFE!!!



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“Of all the things that it is possible to donate, to donate your own body is infinitely more worthwhile”.

- *Manusmriti*

Organ donation is one of the greatest medical marvels of the twentieth century which has saved the lives of several patients. Human organ and tissue transplantation was started in India, way back in 1962. Initially, the organ transplant was unregulated, and organ trafficking was rampant. Then, in 1994, on request of 3 states (Maharashtra, Himachal Pradesh and Goa) the Government of India initiated and promulgated the Transplantation of Human Organs Act that provided for the regulation of removal, storage and transplantation of human organs for therapeutic purposes and for the prevention of commercial dealings in human organs and for matters connected therewith or incidental thereto¹⁰ which legalized the concept of organ harvesting from brain-stem death cases and for the first time, also legally backed organ procurement from heart beating, brain dead and deceased donors¹⁰.

Transplantation, which means the grafting of any human organ from any living person or deceased person to some other living person for therapeutic purposes. Organ donation takes healthy organs and tissues from one person for transplantation into another. Experts say that the organs from one donor can save or help as many as 50 people. Organs you can donate include: kidneys, heart, liver, pancreas, intestines, lungs, skin, bone and bone marrow, cornea, etc.

1. ORGAN DONATION IN INDIA

The success of solid organ transplantation today is mostly governed by the availability of suitable organs. Organ donation in India is slowly rising to take off. The main reason behind this slow take off is lack of awareness. Awareness should increase at all levels, namely,

1. Government-initiated awareness
2. Community-based awareness
3. Hospital-based awareness
4. Public/patient-based awareness

The limited supply of organ donors, whether living or deceased, is a pervasive problem which also encourages organ trafficking & trade in all areas of the world where solid organ transplantation is practiced. Therefore, international organ trade has been recognized as a significant health policy issue in the international community.

- **Problem of Organ Shortage**

In India the awareness on organ donation is very less but the need of organ is much higher. The data from National Organ & Tissue Transplant Organization (NOTTO) given below shows the trends from 1995-2019 with internal variations across all registered hospitals across the nation (Figure 1).

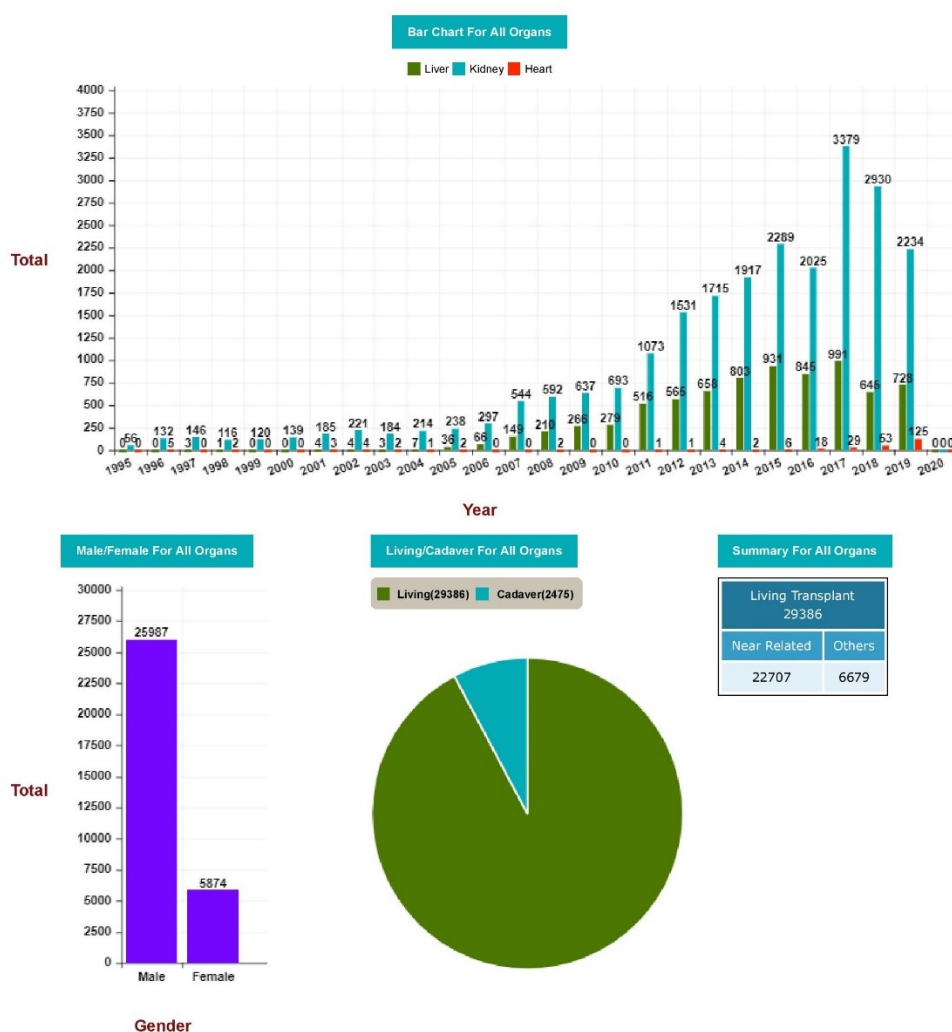


Figure 1: Organ Transplantation Report (1995-2019); Courtesy: <https://www.notto.gov.in/organreport.htm>

Donating organs is a great deed of donating life to others. The number of deaths attributable to chronic kidney disease in India rose from 5.9 lakh in 1990 to 11.8 lakh in 2016. Data on incidence and prevalence of kidney failure remain estimates since there are no kidney failure registries. The Million Death Study estimated the number of kidney failure deaths to be 136,000 in 2015. A 2018 estimate put the number of patients on chronic dialysis in India at about 175,000, giving a prevalence of 12.9 per lakh population. A systematic review estimated that about two-third of all patients with kidney failure died without receiving dialysis in 2010. The same thing happens for eye and other organ donations as well.

Organ shortages are a global problem, but Asia lags behind much of the rest of the world. Although India has performed the second largest number of transplants in the world in 2019 (after United States), it lags far behind the western nations like Spain (3.5 per lakh population), United States (2.19 per lakh population) and United Kingdom (1.55 per lakh population) in national donation with a donation rate of only 0.065 per lakh population (2019) due to its huge population. According to the World Health Organization (WHO), only about 0.01 percent in India donate their organs after death, while in Western countries around 70-80 percent of people pledge their organs. The situation is likely to worsen, as India's population lives longer, organ diseases and problems like diabetes, obesity and hypertension - the main causes of kidney and liver failure - are expected to rise, creating even greater demand for organ donations.

Liver transplantation is the only effective treatment for end-stage liver disease. Over the last 17 years, liver transplant in India has evolved from a rarity to a common procedure available along the length and breadth of the country with survival data comparable to the best centres in the world. India is now in the forefront of Living Donor Liver Transplant in the world. It is possible for all types of recipients and indications with 95% success, with low incidence of vascular complications and biliary complications. While Deceased Donor Liver Transplants have picked up steam in Southern India, there is still a large gap between demand and supply of organs. It is essential to bridge this gap and which continues to be the main curative option for the majority of patients in India suffering from end-stage liver disease and Hepatocellular Carcinoma, confined to the liver.

- ***Why to donate?***

There are only few acts in life that are nobler than donating our organs after death. Organ donation gives a second chance at life for many people. But there are too many on the waiting list who die from lack of a suitable donor. Deceased organ donation is the main source of organs, but it requires the informed consent of the family or the legal heir. In India, nearly 5,00,000 people die every year due to scarcity of organs. Out of these, nearly 2,00,000 die of liver disease and 50,000 of heart ailments. Though nearly 1.5 lakh await a kidney transplant, only 5,000 can get one, while one lakh suffer from corneal blindness and await a transplant.

The WHO's "**Guiding Principles on Human Cell, Tissue and Organ Transplantation**", notes: *"Payment for cells, tissues and organs is likely to take unfair advantage of the poorest and most vulnerable groups, undermines altruistic donation, and leads to profiteering and human trafficking. Such payment conveys the idea that some persons lack dignity, that they are mere objects to be used by others... National law should ensure that any gifts or rewards are not, in fact, disguised forms of payment for donated cells, tissues or organs. Incentives in the form of 'rewards' with monetary value that can be transferred to third parties are not different from monetary payment."*

Non-monetary incentives will help the mandatory "required request" clause in the Transplantation of Human Organs and Tissues Rules, 2014, as per which "any doctor in ICU in a situation of brain stem death, in consultation with transplant coordinator (if available) shall ascertain from the next of kin or the legal heir of the body whether the dead person, while he was alive, had authorized for donation of his or her organs either by filling form 5 or in driving license."

Donating eyes after we are gone from this world is the closest that we can come to giving life to another individual. Eye donation is a wonderful legacy we can leave behind. Your eyes would continue to see the wonders of the world. Eye donation can give precious sight to two individuals. Instead of getting charred or returning to the dust after death, the eyes can breathe life into others. Similarly donating other organs such as liver, kidneys, heart, lungs, etc. can be lifesaving because life is not possible without proper functioning of these organs. Donating these organs after the brain-death to needy-ones is equal to 'Donating a Life' to someone to whom you would never come to know.

- ***Misconceptions and Myths that Surround Organ Donation***

For years, myths and misconceptions have prevented people signing up as donors, here are answers to some common organ donation myths and concerns.

Myth: The organ donor's doctors will not try as hard to save them in an emergency situation.

Fact: The number one priority of the doctor is to save your life not somebody else. Also, the doctor taking care of you will have a specialty where he has no affiliation with the transplantation team.

Myth: The doctor will take out your organs before you are actually dead.

Fact: This is not true and the doctors actually have to take more precautions to see if donors are dead. There are guidelines that are followed before taking organ and tissue donations. These guidelines do not apply if you are not an organ donor.

Myth: If you are an organ or tissue donor you will not be able to have an open casket funeral.

Fact: Organ and tissue donation does not interfere with having an open casket funeral. The organs and tissues from a deceased donor are removed during an operation in an operation theatre and then the incisions are closed. The deceased body is treated with respect and guidelines are followed.

Myth: Organ donation is against my religion.

Fact: All major faiths support organ donation as a humanitarian act. Organ donation is not against any major religion. This includes Hinduism, Catholicism, Protestantism, Islam, and most branches of Judaism. Also, all major religions view organ donation as an act of charity. Hinduism and Buddhism also foster the spirit of selfless giving. Nothing in Hinduism prohibits a person from donating his or her organs.

Myth: The family of the deceased donor will have to pay all expenses towards organ donation.

Fact: Hospital does not charge towards expenses related to organ or tissue donation.

2. WHAT IS BRAIN DEATH?

Brain death literally means that all the functions which are fully governed by the brain are lost which includes respiration as well, but at the same time other organs like liver, kidney and other viscera etc. keep functioning. Heart also maintains its activity but at a lower ebb (due to loss of sympathetic tone and decreased myocardial contractility). Patient continues to sustain with these functions for some time with aid of the supportive measures i.e. assisted ventilation and circulatory maintenance on inotropes, whereas death is defined as 'the irreversible loss of the capacity for consciousness (consciousness is essential to life) combined with irreversible loss of the capacity to breathe'. This concept of death incorporates both a philosophical and physiological approach. Death of the organism as a whole is sufficient, not death of the whole organism (putrefaction). This emphasizes that all death is in fact brain-stem death. Diagnosis of brain-stem death is synonymous with eventual death of the whole organism.

To define that the patient does not have a brain function, the patient should be totally unresponsive. Apnea tests fulfilling all prerequisites, requirements and duration induces no spontaneous respiratory efforts. The diagnosis of brain-stem death requires fulfilment of three clinical criteria:

1. Establishment of a specified condition which has led to irreversible brain damage
2. Exclusion of potentially reversible causes of coma and apnoea and
3. Absence of brain-stem reflexes

The following factors are ruled out: posturing or seizures, metabolic factors including hypernatremia, hypothermia, depression drugs, remediable endocrine disturbances, muscle relaxants, neuro-muscular blocking agents, and potential recoverable factors

There had been many bedside signs and the investigations to prove that the patient is brain dead. Subsequently based on these signs and investigatory results criteria have been established by various countries. Almost all the functions of the brain to be assessed with the criteria formulated by different countries.

Brain stem reflexes to be assessed include following cranial nerve functions:

1. Pupillary responses to light
2. Corneal reflex
3. Vestibulo-ocular reflex
4. Cranial motor response to pain

5. Gag reflex and

6. Cough reflex

There are bit different criteria for brain death in infants and children.

3. DECLARATION OF BRAIN DEATH

Declaration of brain death is a clinical judgment based on definite criteria of brain stem death as laid down in the Act. In adults, there are no published reports of recovery of neurologic function after a diagnosis of brain death using the criteria. Presently, a team of four doctors as authorized by the hospital examine the person twice at a minimum interval of six hours before the declaration. These physicians are independent of the organ transplant team. The team comprises of a Registered Medical Practitioners (RMP) of the Hospital in which brain-stem death has occurred, a RMP nominated from the panel of names approved by the Appropriate Authority, a neurologist/neurosurgeon nominated from the panel of names approved by Appropriate Authority and a RMP treating the aforesaid deceased person. The components of the declaration include patient's details, details of any illness or accident that led to irreversible brain damage, timing of the illness or accident and timing of onset of irreversible coma.

Examination of patients includes exclusion of reversible causes of coma- intoxication (alcohol), depressant drugs, relaxants (neuromuscular blocking agents), primary hypothermia, hypovolaemic shock and metabolic or endocrine disorders. Tests for absence of brain stem functions include establishment of coma, cessation of spontaneous breathing, determination of pupillary size, absent pupillary light reflexes, absent Doll's head eyes movement, absent bilateral corneal reflexes, no motor response in any cranial nerve distribution, any responses to simulation of face limb of trunk, absent gag reflex, absent cough reflex (tracheal), absent eye movements on caloric testing bilaterally and performance of apnoea tests as specified. There should not be any respiratory movements on testing.

4. WHO CAN BE AN ORGAN DONOR?

- **Types of Organ Donation**

Most people can be organ donors. Many people donate an organ upon their death or when they are brain dead. These people are called 'deceased organ donors'. But a person can donate certain organs while he or she is still living. These people are called 'living organ donors'.

- **Deceased Organ Donor**

Most deceased organ donors are brain dead. These people have suffered complete and irreversible loss of all brain functions and thus are clinically and legally dead. Mechanical ventilation and medications keeps their heart beating and blood flowing to their organs. Deceased donor can donate any organ that is medically suitable for transplantation into a recipient.

- **Living Organ Donor**

To be a living donor, a person must be in good health and must also be physically fit. He/she should be free from long-term diseases such as diabetes or high blood pressure, free from mental health problems and should be between the ages of 18 and 60. Living donors can donate a kidney, a lobe (part) of a lung, half of a liver (It will grow back to normal size in both the donor's and in the recipient's body over time), a section of intestine or a part of pancreas. There are Laws governing acceptability of a living donor in our country, which mandates decision to donate under free will & free of duress or coercion.

- **How Can You Be an Organ Donor?**

If you are 18 years of age or older, you may become a donor by signing the donor card in the presence of two witnesses and carrying it with you at all times. If you are under 18, you may become a donor if your parent or legal guardian gives consent.

- **Deceased Donor - Surgical Removal of the Organs**

In deceased organ donation, the donation of biological tissue or an organ of the human body, are removed in a surgical procedure following a determination, based on the donor's medical and social history, only the organs which are suitable for transplantation. One donor can benefit as many as 50 people: commonly needed organs include the heart, kidneys, pancreas, lungs, liver, and intestine.

Tissues that can be transplanted to help others are heart valves, bone, bone marrow, skin, tendons, and corneas. The removal of organs and tissues is a sterile surgical procedure performed in the operating room, just as any surgery is done.

Further, donation neither disfigures the body nor changes the way a person looks. Donation costs nothing to the donor's family.

5. TRANSPLANT COORDINATOR

The needs of patients seeking transplants are diverse and complex, and best met by a multidisciplinary team. Collaboration is essential for a thorough evaluation and comprehensive care of the patient. The transplant coordinator is responsible for ensuring that all elements of evaluation and postoperative process are in place. Transplant coordinators take a central role and act as liaison among other team members. The goal is that the evaluation process is thorough, and the postoperative period uncomplicated.

The evaluation of potential transplant candidates begins before the initial visit. The transplant coordinator obtains information and develops an evaluation plan. A bond is formed at this initial meeting between the potential recipient and the coordinator. The transplant coordinator is in a unique position to become acquainted with and understand the individual needs and preferences of the patient. Specific psychological/medical problems that may interfere with a successful transplant outcome are identified. Social support is assessed at this time. Family members, as well as potential donors, are encouraged to attend visits at the transplant centre. It is also the duty of the transplant coordinator to compile the results of the evaluation for presentation to the candidate selection committee. Education remains the most challenging and core responsibility of the transplant coordinator. This process begins at the initial meeting and continues through the life of the transplant. The transplant coordinator teaches the recipient about the need for immunosuppression, potential side effects and adverse reactions of anticipated medications. Most transplant centres require 3 months of follow-up care before transferring patients to the referring physician for continued care. The coordinator notifies potential candidates when their names are placed on the waiting list for an organ. Candidates are also evaluated periodically by the coordinator to assure ongoing candidacy. When an organ is offered to the transplant team, it is usually the transplant coordinator who notifies the potential candidate. At this time, it is important to assess the patient for immediate contraindication to transplant and to notify the transplant physician.

Patient management issues are especially evident in the post-transplant period. Compliance with follow-up visits and medication is stressed. Before discharge, signs and symptoms of rejection, adverse reactions to medications, recommended routine screening, vaccine recommendation, exercise, and healthy living guidelines are reviewed. As the patient recovers, new information may be introduced. The transplant coordinator is available 24 hours per day at most transplant centres for physician and patient communication. Transplant coordinators have a diverse and challenging responsibility to provide continuous care to the transplant patient. They are an integral part of the transplant team. Many patient issues that are not evident to other team members come to the transplant coordinator's attention. For this reason the transplant coordinator serves a vital role and link in the success of the transplant process.

6. LEGISLATION AND REGULATION

The Transplantation of Human Organs & Tissues Act, 1994 (amended up to 2011) regulates the removal, storage, and transplantation of human organs and tissues for therapeutic purpose. The said act prohibits and prevents commercial dealings in human organs.

The authority to sanction organ donation is vested with the donor himself, who being not less than 18 years of age, in writing in presence of minimum two witnesses, one of whom is a near relative, may authorize removal of any human organ or tissue or both after his death. Removal of any human organ or tissue or both can also be done in absence of written authority, provided the donor before his death and the near relative, after the death of donor express no objection in this regard. In case of brain-stem death, removal can be undertaken after such death is certified by a Board of medical experts and if such person is less than 18 years of age, a written authority of either of the parents is obtained. Removal of any human organ or tissue or both should not be carried out if the body is or is likely to be required for an inquest.

The Amending Act of 2011, casts a duty upon a Doctor working in a hospital to ascertain from the patient admitted in ICU or from his near relative if any prior authority for removal has been given and if no such authority has been given, then to make the patient or near relative aware of the option for donation. Now, grandfather, grandmother, grandson and granddaughter are included in the definition of 'near relative'.

In case of unclaimed bodies lying in a hospital or in a prison for more than 48 hours from time of death, the person in-charge of the hospital or prison may give authority for removal of any human organ or tissue or both if such person has reason to believe that the near relative of the deceased is not likely to come forward to claim the body.

Where death has been caused by accident or any other unnatural cause, the near relative can give authority for removal, provided the deceased person before his death had not revoked his authority or express any objection for removal and also provided such human organ or tissue is not required for post-mortem examination for medico-legal or pathological purposes. The removed human organ or tissue is to be preserved as per current accepted scientific methods.

A living donor, who is not mentally challenged, may donate for transplantation his human organ or tissue or both to his near relative. However, where the donor or recipient being near relative is a foreign national or where the donation is for affection or attachment towards the recipient, such donation is permissible only upon prior approval of the Authorisation Committee. The human organ or tissue or both of a deceased donor may be transplanted into any needy recipient.

The Amending Act, 2011 also allows 'living donor swapping' in the case of near relative, to tide over biological incompatibility between the donor and recipient, but with prior approval of the Authorisation Committee. The Hospital or Tissue Bank must be registered under the Act for purpose of removal, storage or transplantation of human organs or tissues. Law prohibits removal or transplantation for non-therapeutic purpose and casts a duty upon the Doctor to explain all possible effects, complications and hazards of the process to the donor and recipient.

For the purposes of this act, an Appropriate Authority and Advisory Committee have been appointed and constituted, wherein, the Appropriate Authority is empowered to grant, renew, suspend or cancel registration to a Hospital or Tissue Bank; enforce prescribed standards; inspect Hospitals or Tissue Banks and investigate complaint and take appropriate action. The Advisory Committee is to aid and advise the Appropriate Authority and maintain a national registry of donors and recipients. Though the amendment to the Act was passed by the parliament in 2011, and the rules were notified in 2014.

The main provisions of the Act (including the amendments and rules of 2014) are as follows:

- Brain death identified as a form of death. Process and criteria for brain death certification defined (Form 10)
- Allows transplantation of human organs and tissues from living donors and cadavers (after cardiac or brain death)
- **Regulatory and advisory bodies for monitoring transplantation activity and their constitution defined:**

- **Advisory Committee:** Consisting of experts in the domain who shall advise the appropriate authority.
- **Authorization Committee (AC):** Regulates living donor transplantation by reviewing each case to ensure that the living donor is not exploited for monetary considerations and to prevent commercial dealings in transplantation. Proceedings to be video recorded and decisions notified within 24 hours. Appeals against their decision may be made to the State or Central Government.
- **Medical board (Brain Death Committee):** Panel of doctors responsible for brain death certification. In case of non-availability of neurologist or neurosurgeon, any surgeon, physician, anaesthetist or intensivist, nominated by medical administrator in-charge of the hospital may certify brain death.
- **By the person in legal possession of the body:** A doctor shall ask the patient or relative of every person admitted to the ICU whether any prior authorization had been made. If not, the patient or his near relative should be made aware of the option to authorize such donation.
- Authorization process for organ or tissue donation from unclaimed bodies outlined.
- **Organ retrieval permitted from any hospital with ICU facility once registered with the appropriate authority:** Any hospital having Intensive Care Unit (ICU) facilities along with manpower, infrastructure and equipment as required to diagnose and maintain the brainstem dead person and to retrieve and transport organs and tissues including the facility for their temporary storage, can register as a retrieval centre.
- Cost of donor management, retrieval, transportation and preservation to be borne by the recipient, institution, government, NGO or society, and not by the donor family.
- Procedure for organ donation in medico-legal cases defined to avoid jeopardizing.
- Determination of the cause of death and delay in retrieval of organs.
- Manpower and Facilities required for registration of a hospital as a transplant centre outlined.
- Infrastructure, equipment requirements and guidelines and standard operating procedures for tissue banks outlined.
- Qualifications of transplant surgeons, cornea and tissue retrieval technicians defined.
- Appointment of transplant coordinators (with defined qualifications) made mandatory in all transplant centres.
- Non-governmental organisations, registered societies and trusts working in the field of organ or tissue removal, storage or transplantation will require registration.
- The central government to establish a National Human Organs and Tissues Removal and Storage Network i.e. NOTTO (National Organ & Tissue Transplant Organisation), ROTTO (Regional Organ & Tissue Transplant Organisation) and SOTTO (State Organ & Tissue Transplant Organisation). Website www.notto.nic.in. Manner of establishing National or Regional or State Human Organs and Tissues Removal and Storage Networks and their functions clearly stated.
- The central government shall maintain a registry of the donors and recipients of human organs and tissues.
- Penalties for removal of organ without authority, making or receiving payment for supplying human organs or contravening any other provisions of the Act have been made very stringent in order to serve as a deterrent for such activities.

7. DRIVING LICENSE: OPTION FOR ORGAN DONATION

World Health Organization (WHO) in its *Global Status Report on Road Safety* in 2018 revealed that number of annual road traffic deaths has reached 13.5 lakhs, the leading killer of people aged 5-29 years. India registered over 15,000 roadside deaths in 2018.

In India alone, more than 1.5 lakh people lost their lives in road crashes in the country in 2018, registering an increase of 2.4% as compared to the year before, when there were 1.47 lakh fatalities. India is the most unsafe country in the world for road users across 199 countries, as reported by the Geneva-based World Road Federation's World Road Statistics 2018. It's followed by China (63,000 deaths) and the U.S. (37,000 deaths). The annual report also reveals that of the total people killed in road crash deaths in 2018, 48% were between 18 years and 35 years old. Minors involved in road crash deaths were at 6.6% of the total deaths.

Driving license might be a mean to express the desire to be an 'Organ Donor'. Individuals should only be allowed to get new driving licence unless they answer a question about whether they want to donate their organs after death (Yes/No). This may not only improve awareness about organ donation but also 'Organ Donation' per se.

8. NOTTO

National Organ and Tissue Transplant Organization (NOTTO) is a National level organization set up under **Directorate General of Health Services, Ministry of Health and Family Welfare, Government of India** located at 4th and 5th Floor of Institute of Pathology (ICMR) Building in Safdarjung Hospital, New Delhi. National Network division of NOTTO functions as apex centre for All India activities of coordination and networking for procurement and distribution of Organs and Tissues and registry of Organs and Tissues Donation and Transplantation in the country. The following activities are undertaken to facilitate Organ Transplantation in safest way in shortest possible time and to collect data and develop and publish National registry:

- **At National Level:**
- Lay down policy guidelines and protocols for various functions.
- Network with similar regional and state level organizations.
- All registry data from States and regions would be compiled and published.
- Creating awareness, promotion of deceased organ donation and transplantation activities.
- Co-ordination from procurement of organs and tissues to transplantation when organ is allocated outside region.
- Dissemination of information to all concerned organizations, hospitals and individuals.
- Monitoring of transplantation activities in the regions and States and maintaining data-bank in this regard.
- To assist the states in data management, organ transplant surveillance & Organ transplant and Organ Donor registry.
- Consultancy support on the legal and non-legal aspects of donation and transplantation
- Coordinate and Organize trainings for various cadre of workers

- **For Delhi and NCR:**
- Maintaining the waiting list of terminally ill patients requiring transplants
- Networking with transplant centres, retrieval centres and tissue Banks
- Co-ordination for all activities required for procurement of organs and tissues including medico legal aspects.
- NOTTO will assign the Retrieval Team for Organ retrieval and make Transport Arrangement for transporting the organs to the allocated locations.
- NOTTO will maintain the waitlist of patients. needing transplantation in terms of the following:-
 - Hospital wise
 - Organ wise
 - Blood group wise
 - Age of the patient
 - Urgency (on ventilator, can wait etc.)
 - Seniority in the waitlist (First in First Out)
 - Matching of recipients with donors.
 - Allocation, transportation, storage and Distribution of organs and tissues within Delhi and National Capital Territory region.
 - Post-transplant patients & living donor follow-up for assessment of graft rejection, survival rates etc.
 - Awareness, advocacy and training workshops and other activities for promotion of organ donation

9. ORGAN TRANSPLANTATION - A SUCCESS STORY

The first successful human renal allograft transplant was performed by Dr. Murray in 1954 between identical twins. This led to development of a completely new field of organ transplant surgery in medical sciences. Not only this development has saved thousands of lives, it has also improved our understanding of immune mechanisms & infections, concept of death, organ preservation etc.

The kidney was the first and remains the commonest organ to be transplanted but with the passage of time, there has been an ever increasing list of organs which have been used successfully for transplantation. This list now includes liver, heart, lungs, pancreas, small intestine, bone marrow, face, limb, joints, ovaries etc. The main reason for this ever-growing list is the success of the transplantation. With the advent of modern immunosuppressive drugs, the one year survival rates of most solid organ transplants exceed 90% and there are patients who have survived more than 30 years after heart transplant and kidney transplant. Majority of these patients are in the prime of their life. Along with the survival benefit, transplant also provides them freedom from the restrictions imposed by their medical illness and allows them to lead a normal productive life. These excellent survival rates and improved quality of life after transplantation has led to an explosive demand for organs which has not been matched by supply of organs. Unfortunately, the organs have to be obtained from humans and most of them can only be obtained after brain death before the cessation of circulation so that organs are in a healthy & usable condition. In future, organs might be grown in the lab or it might be possible to use organs from some animals but till that time, transplantation remains dependent of the altruistic act of organ donation.

In short, organ transplantation has made rapid strides in the last 60 years and changed its status from an experimental procedure to a well-established treatment modality.

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