In India, 1.5 lakh people are waiting for kidney transplant, 20,000 for liver and 50,000 for heart and 1 lakh for cornea in a year. Whereas, only 120 centers 5500 kidney transplants and four centers and 150-200 liver transplants are done in a year. The magnitude of organ donation from dead bodies in India is estimated to be 50,000 people. In India road fatalities per 1 lakh inhabitants’ per year is 19.5. In 2013, 2.38 lakh died due to road traffic accident in India.

This paper focuses on the history of human organ transplant, types of organ donors, legal aspects related to organ donation, commonest organ donation in India, nurses’ role in facilitating organ donation, and the future for organ donation in India.

History of Human Organ Transplant

The first kidney transplant was done in 1954, in Boston. The first heart transplant was in 1967, in Cape Town; in 1966, Minneapolis – pancreas transplant; 1967 in Pittsburgh liver; in 1983 lungs in Toronto.

In India, the first kidney transplant was done on 2 February 1971 at CMCH Vellore by Dr Mohan Rao and Dr KV Johnny. However the earliest transplant was done by Sushruta in 2nd century BC, who used auto grafted skin transplantation in rhinoplasty.

Organs are commonly donated after natural death, or brain death (cadaver donation) by living persons related to patient.

Commonest organ donations in India are:
- Blood – by living related or unrelated donors.
- Eyes – after natural death. Actor Aishwarya Rai, Amitabh Bachchan, Jaya Bachchan, Rajinikanth have pledged their eyes.
- Kidneys – mostly by unrelated and sometimes related ones.

Organ donation: Anil Kumble, Sunil Shetty, Yukta Mukhi, Revati Menon have endorsed for multi organ donation.

Legal Aspects and the ‘Transplantation of Human Organ Act’ (THOA)

1994 – Government of India’s Transplantation of Human Organ Act was established.

2011 – Transplantation of Human Organs and Tissue Amendment Act was passed.

2013 – Transplantation of Human organs and Tissues Rules were published.

As per 2011, Act – There are provisions in chapter II – (Clause I) for certification of brain death.

The donation process without any legal formalities is limited to the near relatives including the spouse of the recipient. The near relatives’ organ donor (mother, father, brothers, sisters, son, daughter and spouse) has to provide proof of their relationship by genetic testing and/or legal documents. The inclusion of spouse as a possible donor was controversial, as it was felt that this was potentially exploitable and marriages could be performed for the sole purpose of transplantation and later absolved.
By accepting brain death as a form of death and going by the general figures that indicate that 1 to 2 percent of hospital deaths are due to brain death; it was hoped that the law would be able to facilitate the conversion of some of these brain death patients as organ donors. The law at the same time was expected to give a boost to the development of solid organ transplant programmes other than kidney, such as of liver, heart, lungs and pancreas. Since the act has been passed, about 1300 such transplants from cadaver donors have been performed of various organs and it averages at 100 cadaver transplants a year. The donations itself have been confined to a few states such as Tamil Nadu, Andhra Pradesh, Gujarat, Maharashtra and Delhi and the numbers have not short of demand for organs.

The shortage of organs has been due to the reluctance of many family members to donate due to fear of the surgery causing loss to their health, smaller nuclear families with unmatchable donors and a deceased donor programme that is still to evolve fully. This shortage has resulted in an organ trade. In most instances the media expose has indirectly pointed a finger at the medical professionals and the middle man when nabbed has often confessed their involvement. However, it is only in a few instances that clinicians have been prosecuted or barred from practice. Interestingly it has been noted that whenever there is a sting operation on this subject in a state or region it quickly migrates to another and it may be possible that the same group of middle men or a group of people are involved. After one such case that involved donors from many states, the Central Bureau of Investigation took up the case to look into the modus operandi of the organ trade in India.

In India, health comes under the purview of the state government. The THO Act though passed by the parliament in 1994 was not ratified by some states till 2003, which technically meant that without such a law in the state the transplant activities could not be regulated. The THO Act sought to “provide for the regulation of removal, storage, and transplantation of human organs for therapeutic purposes and for the prevention of commercial dealings in human organs”. Once a state passed the act it needed to establish two regulatory bodies. One, the Appropriate Authority (AA) for licensing hospitals to conduct transplant operations, and the other Authorisation Committee (AC) to “prevent” commercial transactions between donors and recipients.

**The law and its implications to nurses**

Nurses may be asked to witness the consent and may be needed to fill the 13 forms as relevant, in keeping with institutional protocols (Table 1).

**Consent** : As per 2011 Act, any person may authorize the removal of his organs or tissue for therapeutic purposes, such authorization should be in writing in the presence of two or more witnesses (at least one should be near relative). In absence of this consent, the next of kin of the dead person may authorize removal of human organs of the deceased person for therapeutic purposes (spouse, son, daughter, father, mother, brother, sister, grandfather, grandmother, grandson-daughter as considered next to kin)

Organs are available to just about 10% of the patients; Merely 10,000 organ transplants happen in total across the country every year; Only 5-10% of total organs donated in India are from brain-dead people; Healthcare industry generates around Rs 500 cr annual revenue from organ transplant, against a potential of over Rs 5000 cr.

**Transplant Nursing**

The field of organ transplantation continues to make major strides with new technology, procedures and treatments. Providing collaborative care as members of an interprofessional team of specialists is just one of the roles of transplant nurses. Because of the shortage of organs for transplantation, transplant nurses play a vital role in donor awareness. Other transplant nurses may become involved in research to help improve transplant recipient outcomes or the care of organ donors.

A global shortage of nurses exists which presents challenge for transplant nurses who must provide the best care possible to transplant patients. Moreover, as the population continues to age and experience multiple chronic conditions, the care required by transplant recipients both in the hospital and community is becoming increasingly complex.

Transplant nursing also encompasses the optimisation of the health care system in which transplant care is delivered. These aspects of care center on quality monitoring, collaboration, education, research, and administration.

Key elements of transplant nursing include:
- Education of the patient, their family and support system, and the community
- Interventions that maintain or improve physiologic, psychological, and social health
- Interventions that facilitate and optimise behavioral change and treatment adherence with complex, lifelong therapies
- Advocacy to support patients, their families and
support systems, in the planning, implementa-

tion, and evaluation of their care

☐ System improvements to support optimal trans-

plant outcomes

☐ Research to broaden and enrich the knowledge
base of transplant nursing, provide evidence for
practice, and bridge practice and theory

**Practice Settings and Roles**

The transplant nurse works in a variety of inpa-
tient, outpatient, and community settings, includ-
ingwards or clinical units, intensive care units,
operating rooms of hospitals, ambulatory care clin-
ics and other clinical facilities in the community.
Regardless of role or setting, all transplant nurses
serve as ambassadors for organ donation and trans-
plantation.

The roles transplant nurses discharge focuses on
Clinical care, coordination of care, transplant recipi-
ents, deceased donors, living donors and advanced
clinical care (**Advanced Practice Transplant Nurse**).

**The Clinical Transplant Nurse** provides patient
care primarily at the bedside, in inpatient wards or
units and operating rooms, and may practice in out-
patient clinics in the community. She focuses on the
delivery of direct care and education to recipients,
donors, and/or their families.

**The Transplant Nurse Coordinator** provides both
direct and indirect patient care responsible for
synchronising all aspects of transplant care across
settings ensuring high quality, efficacious, safe care.
Transplant coordinators further their efforts for opti-
mal patient and family outcomes through education
and research for patients and families, as well as
the transplant healthcare team. They often focus on
provision of care for recipients or organ donors.

**The Transplant Recipient Coordinator** usually
practices in an outpatient or clinic environment with
responsibility of guiding candidates for organ trans-
plantation through the pre-transplant evaluation.
This involves coordinating all aspects of care includ-
ing assuring that necessary pre-transplant tests and
procedures are performed, providing educational in-
formation and emotional support, and following pa-
tients for varying lengths of time post-transplant.

**The Procurement Nurse Coordinator** may prac-
tice in the intensive care environment, emergency
and trauma units, and operating rooms, but may also
travel to distant centres to provide patient and staff
education and to assist in organ procurement. She
has a significant role in providing follow-up support
and advocacy for donor families.

**The Living Donor Nurse Coordinator** works pre-
dominantly in clinics or outpatient settings to pre-
pare and educate potential donors about organ dona-
tion. They will follow patients for varying lengths of
time to help promote full recovery of both physical
and mental health.

**The Advanced Practice Transplant Nurse** works
in various settings such as inpatient units, outpa-
tient clinics, and the community. In the United
States, there are four categories of Advanced Prac-
tice Registered Nurses (APRN) are: Nurse Practicio-
ners, Clinical Nurse Specialists, Nurse Anesthe-
tists, and Nurse Midwives. Advanced practice trans-
plant nurse roles have evolved from general APRN
roles to those that are specialty-based within trans-
plant.

New roles continue to emerge as health care sys-
tems around the world and will continue to evolve as
the field of transplantation expands and becomes more
complex.

**Ethics and Informed Decisions**

The transplant nurse is concerned about the avail-
ability and accessibility of the specialised care re-
quired for donors, transplant candidates, recipients,
families and communities. Transplant nursing is
based on the belief that patients and families have
the right and responsibility to make informed deci-
sions about their care. The transplant nurse may be
faced with caring for patients whose quality of life
can be compromised by unanticipated consequences
of technological advances in health care. As trans-
plant procedures and technologies mature and be-
come more reliable, the potential remains for seri-
ous and enduring unanticipated side-effects. Pa-
tients, their families, and their communities need
to know of such issues.

Ethical issues unique to the conflicts inherent in
transplant nursing often arise. Transplant candidates
and their families face life-threatening illnesses,
where survival is dependent on the availability of
viable, healthy organs. Conflicts may arise between
the rights of the individual, the rights of families,
available accepted scientific and technological treat-
ments, and economic realities. The rights and needs
of the potential transplant recipient must be bal-
anced with the rights and needs of the potential do-
nors and their families, whether the donor is living
or deceased.

Because the need for organs greatly exceeds avail-
ability, it is imperative that ethical principles be fol-
lowed to help ensure the fair and equitable distribu-
tion of organs. The transplant nurse should be aware
of unethical activities such as payment for organs and organ trafficking. When caring for transplant recipients, donors, and families, the transplant nurse should always consider the principles of autonomy, beneficence, confidentiality, equality, and justice. The transplant nurse may participate in discussions and the decision-making processes with other support staff, such as social workers, psychiatrists, patient advocates, and members of ethics boards and hospital committees to resolve such dilemmas.

The transplant nurse recognizes that each patient is a unique human being, and must protect the individual’s basic rights during every phase of the transplant process. She is responsible for reporting incidents of abuse of patients’ rights and practices that are unethical or illegal.

Nurses role in organ donation in India at present is in:

1. Donor selection and preservation of tissue.
2. Creating strategies to improve organ donation and recovery.
3. Educating public/community regarding organ donation.

The role of a nurse in donation and recovery is multifaceted. In addition, to directly working with donors, families, recipients and organ procurement organisations (OPO), she has the potential to influence their hospital / unit’s policy.

For those nurses who wish to become more involved in donation efforts (directly / indirectly), there are several steps that can be taken, to improve donor registries. (1) She should be familiar with local organ procurement programme and encourage colleagues to do the same; (2) understand the ethical, cultural, religious and social issues related to donation of organs and tissues; (3) take active part in educational programmes of staff and public regarding organ donation recruitment; (4) serve as a resource to colleagues, patients and families for the distribution of accurate information; (5) acquire skills and knowledge to work with the health care team, the OPO / tissue bank / hospital in the identification and recovery of viable organs and tissues for transplantation.

**Scope of Transplant Nursing in India**

Nurses can be directly involved in

- Actively identifying possible donors.
- Providing accurate and objective information concerning donation to general public as a Transplant Coordinator.
- Provide clinical expertise, emotional support and information to families who are considering organ and tissue donation.
- Advocate for families and patients on informed choice, recognising and respecting cultural and religious beliefs.
- Working closely with OPO / tissue bank and health team members to seek consideration for organ donation.

**Additionally, a nurse should know:**

- That the cost of donation of organ will be borne by the hospital.
- That the hospital / facility’s priority is to save the lives of patients (Not harvest organs).
- All religions encourage organ donation.
- That the body after donation will be so normal that it can be kept open for people to pay their last respects.
- How to detect potential donors and brain death diagnosis.
- Pre transplant workup and psychological aspects.
- Donor management – Haemodynamic monitoring and management, endocrine management, pulmonary care and correction of electrolyte imbalances.
- Donor management during organ procurement.
- Recipient selection.
- Peri operative management of organ transplant.
- Post-transplant monitoring and infection control.
- Post-transplant quality of life.
- Community education.
- Collaboration of health care teams in referral and conversion rates and outcomes.

Nurses role in organ donation process involves evaluate organ function, bringing to labs within 6 hours of surgery, type and screening, get consent signed, serology testing, taking medical social history, locating potential recipients, managing hemodynamics and arranging operating room.

**Know the teams and the procedure and preservation:** Anaesthetist, Primary Care Physician, Surgical Technician / Scrub Nurse, Circulating Nurse

**Abdominal transplant team:** Surgeon, Physician Assistant, Surgical Recovery Coordinator

**Cardiothoracic team:** Surgeon, Surgical Fellow, Surgical Recovery Coordinator
Organ preservation time: Heart: 4-6 hours; Lungs: 4-6 hours; Liver: 12 hours; Pancreas: 12-18 hours; Kidneys: 72 hours; Small Intestines: 4-6 hours.

Techniques of organ preservation

Because most transplanted organs are from deceased donors, the organ must inevitably be stored after its removal from the donor until it can be transplanted into a suitable recipient. The donor and recipient are often in different locations, and time is needed to transport the donor organ to the hospital where the recipient is being prepared for transplantation. Effective, safe, and reliable methods are needed to preserve the organ ex vivo until transplantation can be performed.

Hypothermic preservation: Hypothermia is the preferred technique of organ preservation because it is simple, does not require sophisticated expensive equipment, and allows ease of transport. Cooling an organ from 37°C to approximately 0°C slows metabolism by a factor of 12-13. Hypothermia alone is not sufficient for adequate preservation because of the time necessary for optimal use of deceased donor organs. Therefore, the organ must also be flushed with an appropriate preservation solution. Two techniques of hypothermic preservation are used: simple cold storage and continuous hypothermic perfusion. With simple cold storage, the organ is flushed with cold preservative solution and placed in a sterile bag immersed in the solution. The sterile bag is placed inside another bag that contains crushed ice. Advantages of simple cold storage include universal availability and ease of transport. With continuous hypothermic perfusion, a machine is used to continuously pump perfusion fluid through the organ. Thus, oxygen and substrates are continuously delivered to the organ, which maintains ion-pump activity and metabolism, including the synthesis of ATP and other molecules.

In India the awareness on organ donation is very low but the need of organ is very much higher. Donating organs is a great deed as donating life to other. Nurses are the lifeline of health care delivery system. If we become aware of our potential and take up the uncharted territory of organ transplant, nobody can stop us from expanding our roles.

Agencies in India involved in organ donation include:

(a) Mohan foundation (Multi organ Harvesting Aid Network) 1977 – Chennai; (b) NOTTO – National Organ and Tissue Transplant organisation under Ministry of Health and Family Welfare, in Safdarjung Hospital, Delhi; (c) Tata Memorial Hospital TMH – Tissue Bank; (d) Zonal Transplant Coordination Centre at Lokmanya Tilak Municipal General Hospital, Mumbai; (e) Zonal Transplant Coordination Centre at KEM Hospital, Pune.

Activities of the above agencies include: Coordination for tissue procurement and distribution; Donor tissue screening; Removal of tissue and screening; Preservation of tissue; Lab screening of tissue; Tissue tracking; Sterilisation; Records maintenance, data processing and maintaining confidentiality; Quality management in tissues; Patients’ information on tissues; Developing guidelines, protocols and standard operating procedures; Training; and Assisting in registration of tissue banks.

Every State according to its zones should have a ZTCC. Zonal Transplant Coordination Centre (ZTCC) is a non-governmental organization that was started for promoting cadaver organ donation with the objective to implement the deceased donor program as per THOA (Transplantation of Human Organ Act) 1994. It ensures that the available cadaveric organs are distributed fairly and equally. Its aim is to increase patient access to state of art transplant technology. It creates a transplant registry and maintain computerised waiting list of recipients for each organ.

The ZTCC maintains a computerised waiting list, blood group wise, for each organ like kidney, liver, heart and lung, as per the priority criteria given in the State guidelines. All the registered transplant hospitals send the information of the patients who require organ in
the prescribed form for listing. For kidney, each patient is given priority score as per the Govt. guidelines. For liver, the priority is mainly as per the blood group and date of registration, if there is no patient in super urgent category. The patient’s name is registered through the hospital and the patients cannot get registered directly to the ZTCC. When the organ is available, it is offered to the patient only in the hospital from where it is registered with the ZTCC.

The ZTCC does organ distribution as per the state priority criteria. When there is a brain death in a registered hospital, the ZTCC is informed. The first kidney goes to the donor hospital patient having the highest priority score in that blood group. The second kidney is offered to the patient on city waiting list as per the priority score. The liver is first offered to the patient only in the hospital from where it is registered with the ZTCC.

The ZTCC co-coordinators contact the hospital co-coordinators who inform the patients about the availability of the organ. The distribution report and reason for refusal are filed in the ZTCC office. The ZTCC, have been promoting organ donation by conducting various awareness activities. Apart from that, they also distribute pamphlet and donor card distribution, put up stalls at community meetings, Ganesh mandals, Navratri Utsav, colleges, corporate, etc.

Our country today needs an aggressive donor management; increased public awareness; good communication between the health team and family members, and well trained team of transplant coordinator to improve the number of organ donation; timely diagnosis of brain death; proper donor organ management and timely harvesting & transport; and good recipient care for its success. Nurses have a great scope here!

**Conclusion**

Organ and tissue donation has a powerful benefit on the health and well-being of community. One individual can save eight lives through organ donation. Despite this no licensed drivers is registered as an organ donor. We have to become aware of ground realities and initiate path breaking changes. We as a country have a great scope !

**References**


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— Editor

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**हिंदी रचनाएं आमंत्रित हैं**

मासिक टी एन ए आई बुलेटिन के हिंदी खंड में प्रकाशन के लिए लघु रचनाओं का स्वागत है। प्रस्तुत की गई सामग्री निर्भर है। व्यक्तिगत आईएसएमएच के लिए अनुमूलक भी भेज सकते हैं। प्रकाशन के विचारांच्छि समाधानक कोंसेप्ट से परिपूर्ण होनी चाहिए। स्पष्ट लिखी या ताज्जू की गई रचनाएं संपादक के नाम भेजें जाएं।

— संपादक