

# Organ donation after brain death in India: A trained intensivist is the key to success

Vijayanand Palaniswamy, Suganya Sadhasivam<sup>1</sup>, Cibi Selvakumaran<sup>2</sup>, Priyadharsan Jayabal<sup>2</sup>, S. R. Ananth<sup>3</sup>

## Abstract

Organ donation after brain death in India is gaining momentum but only in a few states. Tamil Nadu is leading in the country in this regard. Certain cities have performed well compared to Chennai's results. A single tertiary hospital performed 28 donations in a 17 months period with a team of an intensivist and a transplant coordinator. An intensivist needs training and interest in this noble cause. There is no formal training program in this noble cause for doctors in India. A structured formal training needs to be introduced and made mandatory for the doctors in intensive care to make this donation process a successful program.

**Keywords:** India, intensivist, mandatory training, organ donation, organ sharing

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## Introduction

Organ donation after brain death has gained momentum in India in the last few years. Tamil Nadu is leading this program among other states in the country. Intensive care manned by a trained intensivist will make a big difference in taking this noble cause forward. The role of the intensivist is crucial in guiding donors and families through the diagnosis of brain death, donor management after brain death, coordination with organ procurement organizations, and ultimately successful procurement and transplantation to achieve the best possible outcomes.<sup>[1]</sup> However, this is a major deficiency in India as not all intensivists are trained or interested in this area in the current scenario. Mandatory training needs to be introduced by the Indian Society of Critical Care Medicine or Medical Council of India.

## Study Design and Methodology

A retrospective chart review of deceased brain dead organ donors in a tertiary hospital was completed between February 2014 and July 2015. The model included an intensivist driven program along with the transplant coordinator supervised by hospital administration with an organ donation committee [Chart 1]. The patient identification, declaration, and certification were led by the Intensive Care Unit (ICU) specialist along with the three recognized panel members in the hospital. This is the key step which will lead the organ donation process globally. The admitting unit consultant is involved during the first family meeting and from there on the ICU specialist along with transplant coordinator takes care of the process. The paperwork is differentiated between medicolegal and nonmedicolegal cases. The intensivist

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## From:

Intensive Care Unit, Royal Darwin Hospital, Tiwi, Darwin 0801, Australia, <sup>1</sup>Intensive Care Unit, G. Kuppuswamy Naidu Memorial Hospital, <sup>2</sup>Intensive Care Unit, Kovai Medical Center and Hospital, Coimbatore, <sup>3</sup>Intensive Care Unit, SRM Hospital and Research Centre, Kanchipuram, Tamil Nadu, India

## Correspondence:

Dr. Vijayanand Palaniswamy, Royal Darwin Hospital, 107 Rocklands Drive, Tiwi, Darwin 0801, Australia.  
E-mail: [vijaysat2@yahoo.com](mailto:vijaysat2@yahoo.com)

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along with the transplant coordinator liaises with the police and forensic medical officer in a medicolegal case otherwise; the case involves other specialists such as pathologists, nephrologists, transplant surgeons, anesthetists, cardiologists, and pulmonologists. The whole process of coordination is done as per Transplant Authority of Tamil Nadu (TRANSTAN) norms in their website with regular updates to their office in Chennai.<sup>[1]</sup> This chart review was completed for the data review and as part of a quality assurance program.

## Results of Our Review

Our hospital is one of the top corporate hospitals in Tamil Nadu addressing all the specialties and it does have various ICUs. The Medical ICU is a 26 bedded block which comprises patients with various medical and surgical illnesses. Our observational study is the audit of the 28 donations we had during a 17-month period. The hospital belongs to the west zone, one of the three zones divided by the government of Tamil Nadu for organ allocation. The program commenced in our hospital in February 2014 and ran successfully until July 2015. The team comprised an intensive care consultant, five training postgraduates, and a single transplant coordinator. The neurologist and neurosurgeon were very supportive of the program along with the hospital administration. Our cohort of donors was from road traffic accidents and nontraumatic brain injury in equal measure. The youngest donor was 19 years old, and the oldest was 72 years of age. The majority of our donors were males, and they were the "breadwinners" of the family. All the donors underwent brain death testing as per the Transplant of Human Organ and Tissue Act and were declared dead. Six patients had the ancillary testing which was used for the family counseling but not for brain death confirmation. A nuclear medicine study was completed in five of our donors for demonstrating absent cerebral blood flow. A set flow chart protocol was used for the smooth running of the process [Chart 1].

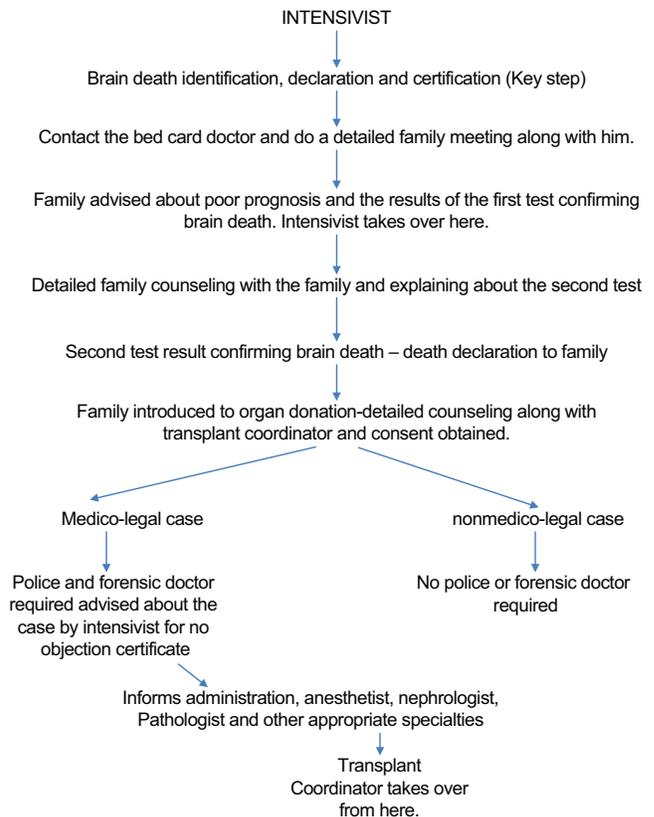
Fifty percent of our donors were identified brain dead within 24 h of ICU admission. The donors were optimized using a set protocol. Noradrenaline was the commonly used vasopressor during the donor optimization. Hormonal resuscitation was used in all patients with steroids in all 28, thyroxine infusion in two, vasopressin in sixteen, and desmopressin in two donors. Adrenaline was used as an inotrope in one patient. The TRANSTAN office situated in Chennai carried out the organ allocation, and the organs were distributed to all zones depending on the availability of the recipients. There are three zones which include areas around Chennai's North zone, Coimbatore and

the surrounding areas such as West, Madurai and the surrounding areas in the South zone. Twenty-six livers were distributed between the three zones and were successfully transplanted. Fifty-two kidneys were successfully transplanted out of our donor pool at various hospitals in the city. Nine kidneys were used for our own patients in our hospital. We had one rejection among our transplanted patient. Two hearts and one *en bloc* heart-lung were utilized from our donors' group and transplanted in Chennai. One patient died after a heart transplant in the city due to postoperative problems. All our donors donated corneas successfully. Six of our donors donated skin which was procured by a team of plastic surgeons from the skin bank within the city located in a private hospital [Table 1].

Table 1 summarizes the sharing mechanism between three zones allocated by TRANSTAN and also the status of the organs retrieved from the donors. It also mentions the immediate follow-up of the organs transplanted including the status of the organs when retrieved.

## Discussion

Intensivists play a major role in the deceased donor program along with transplant coordinators. Spain



**Chart 1:** The pathway for the intensivist to follow in this program for success

**Table 1: Clinical profile of donors and distribution of organs in our hospital between February 2014 and July 2015**

Headings	Details 1	Details 2
Sex	Males - 21	Females - 7
Marital status	Married - 21	Unmarried - 7
Type of case	Medico-legal - 14	Nonmedico-legal - 14
Cause	Road traffic accident - 14	Cerebra-vascular accident - 14
Number of donations in our unit	Year 2014-12 donations	Year 2015 until July - 16 donations
Age of donors (years)	<50 - 19 donors	>50 - 9 donors
Elderly donors (years)	>60 - 2 donors	>70 - 1 donor
Time of identification (days)	<2 - 23 donors	>2 - 5 donors
Noradrenaline use	Yes - 25 donors	No - 3 donors
Vasopressin use	Yes - 17 donors	No - 11 donors
Adrenaline use	Yes - 1 donor	No - 27 donors
Steroids use	Yes - 28 donors	No - 0
Thyroxine use	Yes - 2 donors	No - 26 donors
Desmopressin use	Yes - 3 donors	No - 25 donors
Sodium values	<150 mEq/L - 11 donors	>150 mEq/L - 17 donors
Organ sharing within state of Tamil Nadu	West zone* - 20, North zone - 7, South zone - 1	
Liver shared	West zone - 18, North zone - 7, South zone - 1	Outcome**: Lost - 2-cirrhosis liver-declined on table Early graft failure - 1 Others doing well
Kidneys	West zone - 54 total In-house transplants - 9/54 kidneys	Outcome: Declined - 2-kidneys on table, 1 absent – previous nephrectomy Graft failure - 1 Patient died - 1 Others doing well
Heart shared	West zone - 1 North zone - 1	Outcome: Patient died - 1 (West Zone) Other doing well
Lung shared	North Zone - 1	Patient doing well
Corneas	West zone - 56 donations	
Skin	West zone - 6 donations	

\*One of the three zones in Tamil Nadu – West-Coimbatore with surrounding areas; \*\*Outcome - include the immediate outcome of the organ retrieved with mention of early outcome in recipients

leads the world in deceased donor donation programs with the national average of 38 per million of the population. The success of the program is because of more trained intensivists leading to better conversion rates and the majority of them playing the role of transplant coordinators by themselves. In Spain, it is imperative for all health professionals be trained in deceased organ donation for transplantation specifically with all steps in the donation process. The Transplant Procurement Management educational program in organ and transplant coordination is an academically endorsed degree at the University of Barcelona, Spain, is recognized as the international benchmark for training within the organ donation and transplantation community. This program promotes knowledge transfer and development of professional competencies in organ donation as key factors to maximize donor potentiality and conversion rates. The national average refusal rate is 5%–18%. There is 40% refusal rate in countries like Australia with the national average of organ donation which includes donation after cardiac death at 16 donations per million. Identification of the possibility that donation might occur is a key step in the organ donation process, which is assisted in various ways by “triggers” and other screening processes by specialist medical and

nursing staff with expertise in organ and tissue donation. In countries such as Australia, New Zealand, and Spain it is addressed in various ways by constant engagement of the organ transplant authority with the intensive care and emergency department faculties. In New Zealand, the authority produced a free smartphone application for the health professionals involved in organ donation. It seems likely to improve in the identification of potential donation situations, and in processes of consultation with “organ donation staff” whose special expertise in donation might then be helpfully used by the staff caring for the patient and their family. Considerable attention has been paid by College of Intensive Care Medicine in Australia to developing organ donation best practice and enhancing cooperation and collaboration in donation between intensivists and other clinical staff, donation agencies and transplantation services. One specific shared goal has been to improve the quality of communication around donation. Australia New Zealand Intensive Care Society supports that all Australian intensivists should attend the Core Family Donation Conversation Workshops that have been provided by organ transplant authorities with significant input by our professional bodies. This training is mandatory for all Intensive care trainees in the country.<sup>[2,3]</sup>

In the Indian perspective, there is no formalized training for these intensive care doctors or nurses. This is a major low point for the organ donation cause in India. The organ donation rate in India is 0.36 per million. The majority of deceased organ donors are from road traffic accidents in India. Tamil Nadu has an organ donation rate of 1.9 per million. There is no current database which talks about the refusal rate in India. The challenges we face in India are training and dealing with poor awareness of brain death.<sup>[4-6]</sup> The legal perspective was a challenge until 1994 when Transplantation of Humans Organ Act came into action which was later amended in 2011. This Act included intensivists as one of the key personnel who can declare brain death in a hospital.<sup>[7]</sup> Despite this, the brain death is not promptly declared in ICUs in India due to a lack of awareness and doubts about the legal procedure of certifying brain death.<sup>[8]</sup> This is seriously regarded among intensivists who play a key role in most other countries.

In a study conducted in another developing country on attitudes and knowledge among intensivists only 50% appreciated the high success rate of modern organ transplantation. One-quarter did not know the role of the center of organ transplantation. Although most supported donation from a deceased relative only 13% carried donor cards. They concluded that intensivists need to have better insight into the obstacles to donation that can be solved at the level of hospital and the ICUs. Furthermore, the communication gap between ICUs and organ transplantation centers need to bridge the use of potential donors. To be successful in this cause awareness and training is essential for this group of doctors.<sup>[9]</sup>

## Conclusion

This study was to share our experiences and successes with the existing model provided by TRANSTAN. The results of our quality assurance study showed the success with prompt identification, declaration, certification, and counseling. The review of literature shows poor awareness among the doctors, especially intensivists in our country. It is also appropriate to mention that there is no formal and mandatory training in India. The

Western countries have foreseen success with the existing mandatory training and exercises for the intensive care specialty.

To conclude, following a model as portrayed by the state government success is assured. However, the success lies in identification and certification of brain stem death by the intensivist who runs ICU's in India. A future study by the larger ICU body about the knowledge and attitudes of the intensivists in India will be useful for implementing a mandatory training program on brain death declaration, certification and family conversation for the intensive care specialists and postgraduates to take this program to greater heights. Furthermore, a similar university endorsed degree on organ donation as in Spain is the key to running a successful organ donation program in India.

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## Conflicts of interest

There are no conflicts of interest.

## References

1. TRANSTAN-Transplant Authority of Tamil Nadu: Cadaver Transplant Programme, Government of Tamil Nadu: Tamil Nadu Network of Organ Sharing. Available from: <http://www.dnrhs.org/tnos/faq-information-for-hospitals>. [Last accessed on 2016 Aug 05].
2. Street S, Silvester W. Organ donation in Australia and New Zealand – ICU perspectives. *Crit Care Resusc* 2001;3:48-51.
3. Rudge C, Matesanz R, Delmonico FL, Chapman J. International practices of organ donation. *Br J Anaesth* 2012;108 Suppl 1:148-55.
4. Wig N, Gupta P, Kailash S. Awareness of brain death and organ transplantation among select Indian population. *J Assoc Physicians India* 2003;51:455-8.
5. Baput U, Kedlaya PG; Gokulnath Organ donation, awareness, attitudes and beliefs among post graduate medical students. *Saudi J Kidney Dis Transpl* 2010;21:174-80.
6. Shroff S, Navin S, Abraham G, Rajan PS, Suresh S, Rao S, *et al.* 'Ramachandra protocol' for organ donation. *Antiseptic* 1997;94:73-4.
7. Government of India. Ministry of Law, Justice and Company Affairs (Legislative Department) New Delhi. The Transplantation of Human Organs (Amendment) Act, 2011. (No. 16 of 2011); 2011.
8. Dhanwate AD. Brainstem death: A comprehensive review in Indian perspective. *Indian J Crit Care Med* 2014;18:596-605.
9. Al Sebayel MI, Khalaf H. Knowledge and attitude of intensivists toward organ donation in Riyadh, Saudi Arabia. *Transplant Proc* 2004;36:1883-4.