

## CADAVERIC ORGAN AND TISSUE DONATION

### Introduction

The first cadaveric organ donation in Malaysia took place on 1<sup>st</sup> June 1976 and involved kidneys only. Over the following 20 years, the number of cadaveric organ (mainly kidneys) and tissue (mainly cornea) donations were few and far between and these were managed on an ad hoc basis by the recipient transplant teams. Although there were ample data regarding the subsequent transplantation and the recipients, not much data was available pertaining to these cadaveric donors.

In 1999, Tissue Organ Procurement (TOP) teams were established in 16 MOH hospitals to facilitate the management of the cadaveric organ and tissue donation in the respective hospitals. Since then, TOP teams have also been set up in other MOH hospitals and some university and private hospitals. The setting up of these donor procurement teams saw a three to four fold rise in the number of annual cadaveric donations in the subsequent years.

The National Transplant Procurement Management Unit was set up in 2001. This unit comprises of full time transplant coordinators and is responsible for the central coordination for the management of the cadaveric donor and the procurement of the organs and tissues throughout the country. They work in close liaison with the local TOP teams who manage the donor at hospital level, the recipient transplant teams and the organ/tissue retrieval teams. The unit arranges the logistics of transporting the retrieval teams to the donor and bringing back the organs/tissues to the respective centres for transplantation. It is also responsible for the promotion and central registration of donor pledges as well as the training of hospital staff and increasing awareness of the public and hospital personnel about organ donation. Standard operating procedures (SOPs) and workflows for organ and tissue donation were put into place and better data collection and recording of the cadaveric donation were obtained.

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Table A1: Number of procurement by year, 1997-2004

Year	Number of procurement by year Total=124							
	1997	1998	1999	2000	2001	2002	2003	2004
Number of donors	5	7	4	13	24	30	25	16
Rate of procurement (per million population)	0.25	0.34	0.19	0.59	1.07	1.31	1.07	0.67
Organs procured								
Cornea	4	10	6	18	34	48	40	20
Heart	1	3	2	3	4	-	2	-
Liver	-	-	2	1	1	2	1	3
Kidney	8	10	6	22	38	25	16	18
Heart valve	-	1	2	8	11	11	10	10
Bone	-	1	-	3	2	6	5	5
Skin	-	-	-	2	2	3	-	1

Table A2: Donor's age, 1997-2004

Donor's age	Total=124 No. (%)
Age group, (years)	
<1	1 (0.81)
1-9	6 (4.84)
10-19	22 (17.74)
20-29	26 (20.97)
30-39	11 (8.87)
40-49	23 (18.55)
50-59	21 (16.94)
60-69	7 (5.65)
70-79	6 (4.84)
No data	1 (0.81)
Mean	35.81
SD	18.83
Median	35.00
Minimum*	<1
Maximum**	79.00

\*The youngest donor was 37 days old (donated heart valves); the youngest organ donor was 2.5 years old (donated kidneys and eyes)

\*\*The oldest tissue donor was 79 years old (donated eyes); the oldest organ donor was 65 years old (donated kidneys)

Table A3: Donor's gender, 1997-2004

Donor's gender	Total=124 No. (%)
Gender	
Male	104 (83.87)
Female	20 (16.13)

Table A4: Donor's ethnic group, 1997-2004

<b>Donor's ethnic group</b>	<b>Total=124 No. (%)</b>
Ethnic group	
Malay	5 (4.03)
Chinese	76 (61.29)
Indian	36 (29.03)
Others*	7 (5.65)

\*This included one Orang Asli donor

Table A5: Donor's religion, 1997-2004

<b>Donor's religion</b>	<b>Total=124 No. (%)</b>
Religion	
Islam	7 (5.65)
Buddhism	41 (33.06)
Hinduism	31 (25.00)
Christianity	3 (2.42)
Unknown*	42 (33.87)

\*For 42 Chinese donors the religion was not stated

Table A6: Donor's nationality, 1997-2004

<b>Donor's nationality</b>	<b>Total=124 No. (%)</b>
Nationality	
Malaysian	119 (95.97)
Non-Malaysian	5 (4.03)

Table A7: Donor's state of residence, 1997-2004

<b>Donor's state of residence*</b>	<b>Total=124 No. (%)</b>
State of residence	
Johor	9 (7.26)
Malacca	5 (4.03)
Negeri Sembilan	7 (5.65)
Selangor	27 (21.77)
Kuala Lumpur	14 (11.29)
Putrajaya	1 (0.81)
Perak	13 (10.48)
Kedah	7 (5.65)
Perlis	0 (0)
Pulau Pinang	10 (8.06)
Pahang	8 (6.45)
Terengganu	1 (0.81)
Kelantan	1 (0.81)
Sabah	5 (4.03)
Sarawak	0 (0)
Labuan	0 (0)
Unknown	16 (12.90)

\*State of residence according to home address

Table A8: Donor status, 1997-2004

<b>Donor status</b>	<b>Total=124 No. (%)</b>
Status of donor	
Pledged	13 (10.48)
Non-pledged	111 (89.52)

Table A9: Type of donors, 1997-2004

<b>Type of donors</b>	<b>Total=124 No. (%)</b>
Brain dead	80 (64.52)
Cadaveric tissue donor*	44 (35.48)

\*Post cardiac death, cadaveric tissue donors can only donate tissues such as corneas, heart valves, bone and skin

Table A10: Causes of death, 1997-2004

<b>Causes of death</b>	<b>Brain dead organ donors Total=80 No. (%)</b>	<b>Cadaveric tissue donors Total=44 No. (%)</b>	<b>Total=124 No. (%)</b>
Injury from MVA	45 (56.25)	16 (36.36)	61 (49.19)
Injury from fall	5 (6.25)	0 (0)	5 (4.03)
Injury from assault	3 (3.75)	1 (2.27)	4 (3.23)
Injury from industrial accident	1 (1.25)	0 (0)	1 (0.81)
Spontaneous hypertensive intracranial bleed	10 (12.5)	4 (9.09)	14 (11.29)
Spontaneous AVM/ Aneurysm intracranial bleed	7 (8.75)	1 (2.27)	8 (6.45)
Brain anoxia	1 (1.25)	1 (2.27)	2 (1.61)
Brain tumour	2 (2.5)	0 (0)	2 (1.61)
Thromboembolic brain infarct	3 (3.75)	2 (4.55)	5 (4.03)
Cardiac disease	1 (1.25)	12 (27.27)	13 (10.48)
Drowning	0 (0)	1 (2.27)	1 (0.81)
Others	1 (1.26)	5 (11.36)	6 (4.84)
Unknown	1 (1.25)	1 (2.27)	2 (1.61)

Table A11: Blood group, 1997-2004

<b>Blood group</b>	<b>Total=124 No. (%)</b>
A positive	24 (19.35)
B positive	25 (20.16)
AB positive	3 (2.42)
O positive	39 (31.45)
Not available*	33 (26.61)

\*Cadaveric donors who donated tissues only were not tested for blood group

Table A12: Transmissible infection screening on cadaveric donors, 1997-2004

Transmissible infection screening	Total donor=124 Total screened=123*
HIV serology	
Non-reactive	123
Hepatitis B surface antigen	
Non-reactive	121
Reactive	2 **
Hepatitis B Core Antibody ***	
Non-reactive	5
Reactive	5
Hepatitis C status	
Non-reactive	122
Reactive	1****
VDRL status	
Non-reactive	123
Toxoplasma status *****	
Non-reactive	114
Reactive	8
CMV IgG status *****	
Non-reactive	104
Reactive	18

\*Of 124 donors one cadaveric tissue donor could not be tested for serology as blood taken at the time of procurement was lysed; the tissues procured were not utilised for transplantation

\*\*Kidneys from these donors were transplanted into HbsAg positive recipients

\*\*\*Hepatitis B Core Antibody serology has been done since 2003 for potential cadaveric liver donors. Ten donors who were HbsAg negative were tested for Hepatitis B Core Antibody; 5 were found to be Core Antibody reactive. These 5 were further tested for Hbs Antibody and 3 were found to be reactive for Hbs Antibody indicating recovery from Hepatitis B infection with natural immunity

\*\*\*\*One eye donor was found to be Hepatitis C Antibody reactive and the eyes that were procured were not utilised for transplantation

\*\*\*\*\*Cadaveric tissue donors were not tested for CMV or Toxoplasma serology if only corneas or heart valves were donated

Table A13: Procurement details, 1997-2004

<b>Procurement details</b>	<b>Total=124 No. (%)</b>
Type of institution where donor came from	
MOH state/general hospitals	80 (64.52)
MOH district hospitals	10 (8.06)
University hospitals	16 (12.90)
Private hospitals	16 (12.90)
Home	2 (1.61)
Location where donor was referred from	
ICU	57 (45.97)
Ward	5 (4.03)
Emergency department	8 (6.45)
Mortuary	12 (9.68)
Home	2 (1.61)
Not available	41 (33.06)
Location where procurement was done	
Operation theatre	76 (61.29)
Mortuary	41 (33.06)
Ward	5 (4.03)
Home*	2 (1.61)

\*Procurement of organs and tissues from brain dead donors were carried out in the operation theatre, while multi-tissue procurement from cadaveric tissue donors was mainly done in the mortuary. Procurement in the ward and at home involved corneas only