

CHAPTER 8

CADAVERIC ORGAN AND TISSUE DONATION

Editor:

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8.0 INTRODUCTION

The year 2005 saw a decline in the number of potential donor referrals made to the National Transplant Procurement and Management Unit and subsequent actual number of organ and tissue donations. From a total of 62 potential donor referrals there were 13 actual donors, of which only 5 were brain dead multi-organ and tissue donors while 8 were post cardiac death tissue donors. This represented a rate of 0.53 donations per million population. Although generally the number of the various organs and tissues decreased, we had our first lung donor in December 2005 (Table 8.1) who successfully donated for a double lung transplant.

Compared to previously, the donors came from the older age group, with mean age 46.4 ± 24.8 years. The youngest was a Malay three year old child who donated liver, kidneys, heart valves and eyes, while the oldest was an 81 year old eye donor (Table 8.2). All the donors were Malaysians, of whom more than half were Indians (7 donors) followed by Chinese (5 donors) and the sole Malay boy. There were more male donors than female (62% versus 38 %) (Table 8.3–8.6).

More than half of the donors came from Selangor (7 donors) with 3 of the donations taking place in Selayang hospital (Table 8.7). 10 of the donations were initiated by the next of kin including for the only 3 donors who carried the donor pledge card. Majority of the donors deaths in 2005 were due to medical causes, with only 3 being due to road accident deaths and there was one homicide case (Table 8.10). More than half of the procurements took place in the bigger state general hospitals but there were increased number of donations (5 out of 13) from private hospitals (Table 8.12).

Table 8.1: Number of procurement by year, 1997-2005

Number of procurement by year									
Total=137									
Year	1997	1998	1999	2000	2001	2002	2003	2004	2005
Number of donors	5	7	4	13	24	30	25	16	13
Rate of procurement (per million population)	0.25	0.34	0.19	0.59	1.07	1.31	1.07	0.67	0.53
Organs procured									
Cornea	4	10	6	18	34	48	40	20	22
Heart	1	3	2	3	4		2		1
Liver			2	1	1	2	1	3	3
Kidney	8	10	6	22	38	25	16	18	8
Heart valve		1	2	8	11	11	10	20	6
Bone		1		3	2	6	5	5	2
Skin				2	2	3		1	-
Lung									1

Table 8.2: Donor's age, 1997-2005

Donor's age	No. (%)									
	1997 N=5	1998 N=7	1999 N=4	2000 N=13	2001 N=24	2002 N=30	2003 N=25	2004 N=16	2005 N=13	Total N=137
Age (year)										
<1	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (4)	0 (0)	0 (0)	1 (1)
1-9	1 (20)	0 (0)	0 (0)	1 (8)	1 (4)	1 (3)	1 (4)	1 (6)	1 (8)	7 (5)
10-19	0 (0)	1 (14)	2 (50)	7 (54)	2 (8)	3 (10)	4 (16)	3 (19)	1 (8)	23 (17)
20-29	1 (20)	3 (43)	2 (50)	1 (8)	6 (25)	6 (20)	4 (16)	3 (19)	2 (15)	28 (20)
30-39	1 (20)	0 (0)	0 (0)	0 (0)	5 (21)	1 (3)	2 (8)	2 (13)	1 (8)	12 (9)
40-49	0 (0)	1 (14)	0 (0)	2 (15)	4 (17)	8 (27)	4 (16)	4 (25)	2 (15)	25 (18)
50-59	1 (20)	2 (29)	0 (0)	1 (8)	4 (17)	7 (23)	3 (12)	3 (19)	1 (8)	22 (16)
60-69	0 (0)	0 (0)	0 (0)	1 (8)	2 (8)	1 (3)	3 (12)	0 (0)	3 (23)	10 (7)
70-79	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	3 (10)	3 (12)	0 (0)	1 (8)	7 (5)
80-89	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (8)	1 (1)
No data	1 (20)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (1)
Total	5	7	4	13	24	30	25	16	13	137
Mean	27.3	34.4	20.5	25.2	36.8	41.9	39.4	32.5	46.4	36.8
SD	21.1	17.1	4.4	18.7	15.7	18.9	22.3	15.6	24.8	19.6
Median	28	25	21	17	37	46	40	31.5	48	38
Minimum	2	16	15	5	8	4	<1*	8	3	<1*
Maximum	21	57	25	60	66	79	77	55	81**	81**

* The youngest tissue 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 81 years old (donated eyes); the oldest organ donor was 65 years old (donated kidneys)

Table 8.3: Donor's gender, 1997-2005

Donor's gender	No. (%)									
	1997 N=5	1998 N=7	1999 N=4	2000 N=13	2001 N=24	2002 N=30	2003 N=25	2004 N=16	2005 N=13	Total N=137
Male	3 (60)	7 (100)	3 (75)	11 (85)	20 (83)	27 (90)	21 (84)	12 (75)	8 (62)	112 (82)
Female	2 (40)	0 (0)	1 (25)	2 (15)	4 (17)	3 (10)	4 (16)	4 (25)	5 (38)	25 (18)

Table 8.4: Donor's ethnic group, 1997-2005

Donor's ethnic group	No. (%)									
	1997 N=5	1998 N=7	1999 N=4	2000 N=13	2001 N=24	2002 N=30	2003 N=25	2004 N=16	2005 N=13	Total N=137
Malay	1 (20)	0 (0)	0 (0)	2 (15)	1 (4)	0 (0)	0 (0)	1 (6)	1 (8)	6 (4)
Chinese	3 (60)	4 (57)	4 (100)	7 (54)	17 (71)	13 (43)	14 (56)	14 (88)	5 (38)	81 (59)
Indian	1 (20)	3 (43)	0 (0)	3 (23)	4 (17)	15 (50)	9 (36)	1 (6)	7 (54)	43 (31)
Others*	0 (0)	0 (0)	0 (0)	1 (8)	2 (8)	2 (7)	2 (8)	0 (0)	0 (0)	7 (5)

* This category included one Orang Asli donor

Table 8.5: Donor's religion, 1997-2005

Donor's religion	No. (%)									
	1997 N=5	1998 N=7	1999 N=4	2000 N=13	2001 N=24	2002 N=30	2003 N=25	2004 N=16	2005 N=13	Total N=137
Islam	1 (20)	0 (0)	0 (0)	2 (15)	1 (4)	0 (0)	1 (4)	2 (13)	1 (8)	8 (6)
Buddhism	3 (60)	3 (43)	0 (0)	0 (0)	1 (4)	5 (17)	15 (60)	14 (88)	5 (38)	46 (34)
Hinduism	1 (20)	3 (43)	0 (0)	3 (23)	3 (13)	13 (43)	8 (32)	0 (0)	5 (38)	36 (26)
Christianity	0 (0)	0 (0)	0 (0)	1 (8)	0 (0)	1 (3)	1 (4)	0 (0)	0 (0)	3 (2)
Others*	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	2 (15)	2 (1)
Unknown**	0 (0)	1 (14)	4 (100)	7 (54)	19 (79)	11 (37)	0 (0)	0 (0)	0 (0)	42 (31)

* This category included one Sikhism and one Sinhalese

** For 42 Chinese donors the religion was not stated

Table 8.6: Donor's nationality, 1997-2005

Donor's nationality	No. (%)									
	1997 N=5	1998 N=7	1999 N=4	2000 N=13	2001 N=24	2002 N=30	2003 N=25	2004 N=16	2005 N=13	Total N=137
Malaysian	5 (100)	7 (100)	4 (100)	13 (100)	21 (88)	29 (97)	24 (96)	16 (100)	13 (100)	132 (96)
Non-Malaysian	0 (0)	0 (0)	0 (0)	0 (0)	3 (13)	1 (3)	1 (4)	0 (0)	0 (0)	5 (4)

Table 8.7: Donor's state of residence, 1997-2005

Donor's state of residence*	No. (%)									
	1997 N=5	1998 N=7	1999 N=4	2000 N=13	2001 N=24	2002 N=30	2003 N=25	2004 N=16	2005 N=13	Total N=137
Johor	0 (0)	0 (0)	0 (0)	3 (23)	0 (0)	2 (7)	3 (12)	1 (6)	1 (8)	10 (7)
Malacca	0 (0)	1 (14)	1 (25)	0 (0)	0 (0)	1 (3)	2 (8)	0 (0)	1 (8)	6 (4)
Negeri Sembilan	0 (0)	1 (14)	0 (0)	1 (8)	0 (0)	1 (3)	4 (16)	0 (0)	1 (8)	8 (6)
Selangor	2 (40)	1 (14)	0 (0)	0 (0)	3 (13)	9 (30)	6 (24)	6 (38)	7 (54)	34 (25)
WP Kuala Lumpur	1 (20)	1 (14)	2 (50)	0 (0)	0 (0)	5 (17)	2 (8)	3 (19)	2 (15)	16 (12)
WP Putrajaya	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (3)	0 (0)	0 (0)	0 (0)	1 (1)
Perak	1 (20)	2 (29)	1 (25)	3 (23)	0 (0)	4 (13)	0 (0)	2 (13)	1 (8)	14 (10)
Kedah	0 (0)	0 (0)	0 (0)	2 (15)	3 (13)	1 (3)	0 (0)	1 (6)	0 (0)	7 (5)
Perlis	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Pulau Pinang	0 (0)	0 (0)	0 (0)	1 (8)	3 (13)	1 (3)	3 (12)	2 (13)	0 (0)	10 (7)
Pahang	0 (0)	1 (14)	0 (0)	0 (0)	3 (13)	2 (7)	2 (8)	0 (0)	0 (0)	8 (6)
Terengganu	0 (0)	0 (0)	0 (0)	0 (0)	1 (4)	0 (0)	0 (0)	0 (0)	0 (0)	1 (1)
Kelantan	0 (0)	0 (0)	0 (0)	1 (8)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (1)
Sabah	0 (0)	0 (0)	0 (0)	2 (15)	1 (4)	0 (0)	1 (4)	1 (7)	0 (0)	5 (4)
Sarawak	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Labuan	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Others**	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (4)	0 (0)	0 (0)	1 (1)
Unknown	1 (20)	0 (0)	0 (0)	0 (0)	10 (42)	3 (10)	1 (4)	0 (0)	0 (0)	15 (11)

*State of residence according to home address

**One donor in year 2003 came from Yangon, Myanmar

Table 8.8: Donor's status, 1997-2005

Donor's status	No. (%)									
	1997 N=5	1998 N=7	1999 N=4	2000 N=13	2001 N=24	2002 N=30	2003 N=25	2004 N=16	2005 N=13	Total N=137
Pledged	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	5 (17)	6 (24)	2 (13)	3 (23)	16 (12)
Non-pledged	5 (100)	7 (100)	4 (100)	13 (100)	24 (100)	25 (83)	19 (76)	14 (88)	10 (77)	121 (88)

Table 8.9: Type of donors, 1997-2005

Type of donors	No. (%)									
	1997 N=5	1998 N=7	1999 N=4	2000 N=13	2001 N=24	2002 N=30	2003 N=25	2004 N=16	2005 N=13	Total N=137
Brain death	4 (80)	6 (86)	4 (100)	11 (85)	20 (83)	17 (57)	8 (32)	10 (63)	5 (38)	85 (62)
Cardiac death	1 (20)	1 (14)	0 (0)	2 (15)	4 (17)	13 (43)	17 (68)	6 (38)	8 (62)	52 (38)

Table 8.10: Blood group, 1997-2005

Blood group	No. (%)									
	1997 N=5	1998 N=7	1999 N=4	2000 N=13	2001 N=24	2002 N=30	2003 N=25	2004 N=16	2005 N=13	Total N=137
A positive	1 (20)	1 (14)	0 (0)	1 (8)	6 (25)	5 (17)	7 (28)	3 (19)	2 (15)	26 (19)
B positive	0 (0)	1 (14)	1 (25)	5 (38)	4 (17)	4 (13)	5 (20)	5 (31)	3 (23)	28 (20)
AB positive	1 (20)	1 (14)	0 (0)	0 (0)	1 (4)	0 (0)	0 (0)	0 (0)	0 (0)	3 (2)
O positive	2 (40)	2 (29)	3 (75)	5 (38)	12 (50)	8 (27)	2 (8)	5 (31)	3 (23)	42 (31)
Not done*	1 (20)	2 (29)	0 (0)	2 (15)	1 (4)	13 (43)	11 (44)	3 (19)	5 (38)	38 (28)

* Blood group not required for post cardiac death tissue donors

Table 8.11: Causes of death, 1997-2005

Causes of death	No. (%)											
	1997 N=5		1998 N=7		1999 N=4		2000 N=13		2001 N=24			
	Brain dead organ donors N=4	Cardiac death tissue donors N=1	Brain dead organ donors N=6	Cardiac death tissue donors N=1	Brain dead organ donors N=4	Cardiac death tissue donors N=0	Brain dead organ donors N=11	Cardiac death tissue donors N=2	Brain dead organ donors N=20	Cardiac death tissue donors N=4		
Injury from MVA	1 (25)	0 (0)	5 (83)	0 (0)	3 (75)	0 (0)	5 (45)	2 (100)	11 (55)	0 (0)		
Injury from fall	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (5)	0 (0)		
Injury from assault	0 (0)	0 (0)	1 (17)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (5)	0 (0)		
Injury from industrial accident	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)		
Spontaneous hypertensive intracranial bleed	2 (50)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	2 (18)	0 (0)	3 (15)	1 (25)		
Spontaneous AVM / Aneurysm intracranial bleed	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (9)	0 (0)	1 (5)	0 (0)		
Brain anoxia	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)		
Brain tumour	1 (25)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (9)	0 (0)	0 (0)	0 (0)		
Thromboembolic brain infarct	0 (0)	0 (0)	0 (0)	1 (100)	0 (0)	0 (0)	1 (9)	0 (0)	0 (0)	1 (25)		
Cardiac disease	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)		
Drowning	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)		
Others	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (5)	1 (25)		
Unknown	0 (0)	1 (100)	0 (0)	0 (0)	1 (25)	0 (0)	1 (9)	0 (0)	2 (10)	1 (25)		

Table 8.11: Causes of death, 1997-2005

Causes of death	No. (%)											
	2002 N=30		2003 N=25		2004 N=16		2005 N=13		Total N=137			
	Brain dead organ donors N=17	Cardiac death tissue donors N=13	Brain dead organ donors N=8	Cardiac death donors N=17	Brain dead organ donors N=	Cardiac death tissue donors N=	Brain dead organ donors N=5	Cardiac death tissue donors N=8	Brain dead organ donors N=85	Cardiac death tissue donors N=52		
Injury from MVA	10 (59)	7 (54)	6 (75)	3 (18)	2 (20)	3 (50)	1 (20)	2 (25)	44 (52)	17 (33)		
Injury from fall	0 (0)	0 (0)	1 (13)	0 (0)	2 (20)	0 (0)	0 (0)	0 (0)	4 (5)	0 (0)		
Injury from assault	0 (0)	0 (0)	0 (0)	0 (0)	1 (10)	1 (17)	1 (20)	0 (0)	4 (5)	1 (2)		
Injury from industrial accident	1 (6)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (1)	0 (0)		
Spontaneous hypertensive intracranial bleed	1 (6)	0 (0)	0 (0)	1 (6)	1 (10)	2 (33)	1 (20)	0 (0)	10 (12)	4 (8)		
Spontaneous AVM / Aneurysm intracranial bleed	2 (12)	0 (0)	0 (0)	1 (6)	3 (30)	0 (0)	0 (0)	0 (0)	7 (8)	1 (2)		
Brain anoxia	1 (6)	0 (0)	0 (0)	1 (6)	0 (0)	0 (0)	0 (0)	0 (0)	1 (1)	1 (2)		
Brain tumour	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	2 (2)	0 (0)		
Thromboembolic brain infarct	1 (6)	0 (0)	1 (13)	0 (0)	0 (0)	0 (0)	1 (20)	0 (0)	4 (5)	2 (4)		
Cardiac disease	0 (0)	5 (38)	0 (0)	7 (41)	1 (10)	0 (0)	1 (20)	3 (38)	2 (2)	15 (29)		
Drowning	0 (0)	0 (0)	0 (0)	1 (6)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (2)		
Others	0 (0)	1 (8)	0 (0)	3 (18)	0 (0)	0 (0)	0 (0)	3 (38)	1 (1)	8 (15)		
Unknown	1 (6)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	5 (6)	2 (4)		

Table 8.12a: Procurement details on type of institution where donor came from, 1997-2005

Procurement details	No. (%)									
	1997 N=5	1998 N=7	1999 N=4	2000 N=13	2001 N=24	2002 N=30	2003 N=25	2004 N=16	2005 N=13	Total N=137
Type of institution where donor came from										
MOH state/ general hospitals	2 (40)	5 (71)	1 (25)	10 (77)	16 (67)	19 (63)	15 (60)	12 (75)	7 (54)	87 (64)
MOH district hospitals	0 (0)	0 (0)	0 (0)	2 (15)	0 (0)	2 (7)	4 (16)	2 (13)	0 (0)	10 (7)
University hospitals	1 (20)	1 (14)	0 (0)	0 (0)	6 (25)	4 (13)	3 (12)	1 (6)	1 (8)	17 (12)
Private hospitals	1 (20)	1 (14)	3 (75)	1 (8)	2 (8)	4 (13)	3 (12)	1 (6)	5 (38)	21 (15)
Home	1 (20)	0 (0)	0 (0)	0 (0)	0 (0)	1 (3)	0 (0)	0 (0)	0 (0)	2 (1)

Table 8.12b: Procurement details on location where donor was referred from, 1997-2005

Procurement details	No. (%)									
	1997 N=5	1998 N=7	1999 N=4	2000 N=13	2001 N=24	2002 N=30	2003 N=25	2004 N=16	2005 N=13	Total N=137
Location where donor was referred from										
ICU	1 (20)	0 (0)	0 (0)	1 (8)	14 (58)	16 (53)	13 (52)	12 (75)	8 (62)	65 (47)
Ward	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (3)	3 (12)	1 (6)	3 (23)	8 (6)
Emergency department	0 (0)	0 (0)	0 (0)	0 (0)	3 (13)	4 (13)	1 (4)	0 (0)	0 (0)	8 (6)
Mortuary	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	3 (10)	6 (24)	3 (19)	1 (8)	13 (9)
Home	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (3)	0 (0)	0 (0)	0 (0)	1 (1)
Not available	4 (80)	7 (100)	4 (100)	12 (92)	7 (29)	5 (17)	2 (8)	0 (0)	1 (8)	42 (31)

Table 8.12c: Procurement details on location where procurement was done, 1997-2005

Procurement details	No. (%)									
	1997 N=5	1998 N=7	1999 N=4	2000 N=13	2001 N=24	2002 N=30	2003 N=25	2004 N=16	2005 N=13	Total N=137
Location where procurement was done										
Operation theatre	4 (80)	6 (86)	4 (100)	11 (85)	20 (83)	14 (47)	8 (32)	9 (56)	5 (38)	81 (59)
Mortuary	0 (0)	1 (14)	0 (0)	2 (15)	3 (13)	14 (47)	14 (56)	7 (44)	5 (38)	46 (34)
Ward	0 (0)	0 (0)	0 (0)	0 (0)	1 (4)	1 (3)	3 (12)	0 (0)	2 (15)	7 (5)
Home	1 (20)	0 (0)	0 (0)	0 (0)	0 (0)	1 (3)	0 (0)	0 (0)	0 (0)	2 (1)
Not available	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (8)	1 (1)