

AUSTRALIA

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Summary

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SUMMARY - AUSTRALIA

The salient features from the last survey year to 31st. October, 1988 were:

- 1) There were 5399 (327 per million) patients in Australia receiving treatment for renal failure: 2598 patients (157 per million) dialysis dependent and 2801 (169 per million) patients with a functioning transplant.

Increasing discordance between the number of transplant and dialysis patients has been a continuing trend since 1986. See Page 6.

- 2) There were 759 new patients (46 per million) treated in 1988: the largest age group was 60-69 years old (25% of patients), closely followed by the 50-59 year old group (23% of patients).

33% of new patients were more than 60 years old, which represented a marked and continuing increase from 10% of new patients a decade earlier.

Analgesic nephropathy cases showed a further decline. The annual number of new cases had fallen from 7.7 per million to 5.5 per million, 21% to 12% of new cases during 1977-1988. See Pages 14-18.

- 3) The number of dialysis patients increased by 5% (131 patients), mostly CAPD and satellite self-care haemodialysis. There were 790 CAPD patients: 30% of dialysis patients and 56% of all home dialysis patients.

68% of patients were dialysing at home or at a satellite self-care centre.

There were 998 of the 2598 dialysis patients who were more than 60 years old. See Page 34.

- 4) Longer term haemodialysis patient survival was 52% at six years; 77% for patients under 50 years old and 50% for those over 50 years old. See Pages 40 and 41.

During 1985-1988 diabetic dialysis patients survived longer with continuous peritoneal dialysis (CAPD): non-diabetic patients survived slightly better with haemodialysis.

SUMMARY - AUSTRALIA

4) (Cont)

A surprisingly large proportion of elderly haemodialysis patients switched to peritoneal dialysis (mainly CAPD) within three months of their first haemodialysis treatment. For discussion see Pages 42 and 43.

- 5) The 448 transplant operations performed in 1988 was the highest annual total but still represented only 28% awaiting transplantation. The median period of dialysis for those transplanted was between one and two years. See Page 25.

During 1986-1988 there were five transplant operations using unrelated living donor kidneys. See Page 52.

- 6) ATG/OKT3 was used for rejection in 26% of first grafts and 40% of second grafts in 1988. See Pages 58 and 59.

- 7) The twelve month graft survivals for first and second cadaver grafts performed during 1985-1988 were 82% and 75% respectively. There had been a striking improvement compared to 1980-1984, especially for non primary grafts. See Pages 60 and 61.

- 8) Elderly donor kidneys (over 60 years old) had a significantly lower twelve month graft survival. See Pages 64-66.

- 9) A major success has been the removal of much of the adverse effect of sensitisation of both primary and non primary graft survival. See Pages 67-69.

- 10) HLA mismatching of 1026 Cyclosporin A treated patients from 1985-1988 with primary cadaver grafts showed a 10% advantage for the grafts well matched at the B locus and DR locus combined. See Pages 72-73.

- 11) Combination drug treatment including Cyclosporin A seemed advantageous compared to Cyclosporin A alone. An increasing proportion of patients received triple drug therapy with Cyclosporin A, Azathioprine and Prednisolone. See Page 76.

Figure 1.

LIVING TRANSPLANT AND DIALYSIS PATIENTS
AUSTRALIA 1977-1988
1986-1989

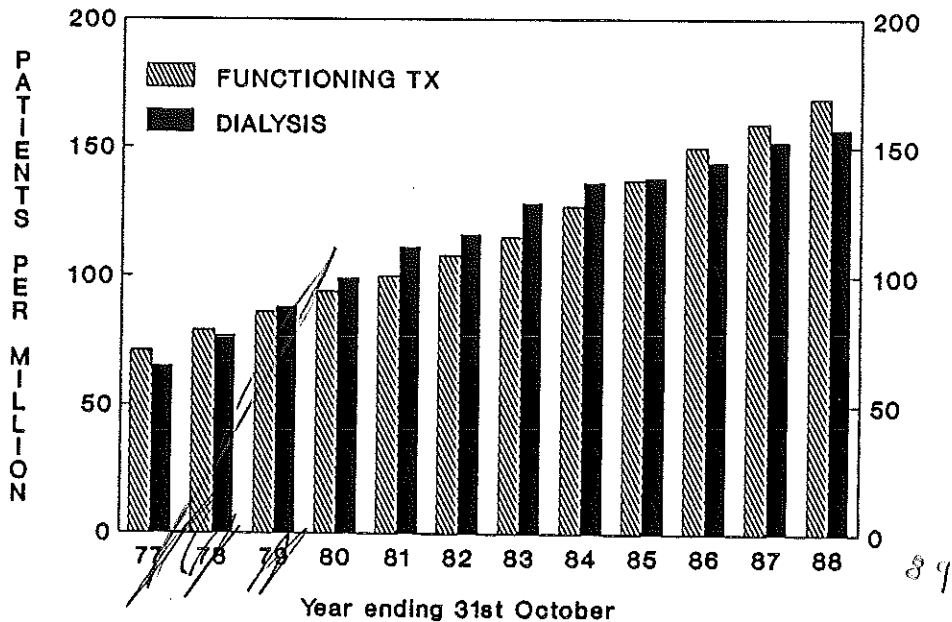


TABLE 1

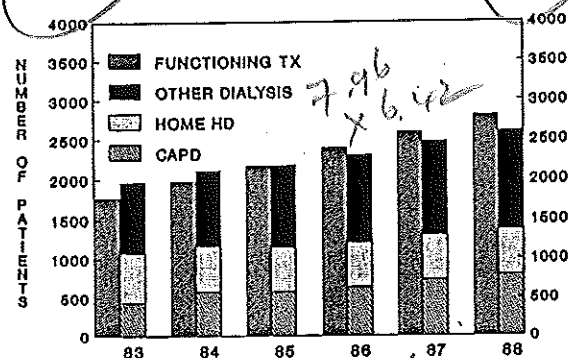
LIVING TRANSPLANT AND DIALYSIS PATIENTS

	FUNCTIONING TRANSPLANT	PER MILLION	DIALYSIS	PER MILLION	TOTAL	PER MILLION
OCTOBER						
1977	1009	71	915	65	1924	135
1978	1124	79	1092	77	2216	156
1979	1237	86	1266	88	2503	174
1980	1362	94	1443	99	2805	193
1981	1495	100	1647	111	3142	211
1982	1645	108	1762	116	3407	225
1983	1771	115	1965	128	3736	243
1984	1975	127	2108	136	4083	263
1985	2164	137	2174	138	4338	275
1986	2390	150	2298	144	4688	294
1987	2583	159	2467	152	5050	311
1988	2801	169	2598	157	5399	327
1989	3052	182	2734	163	5786	344

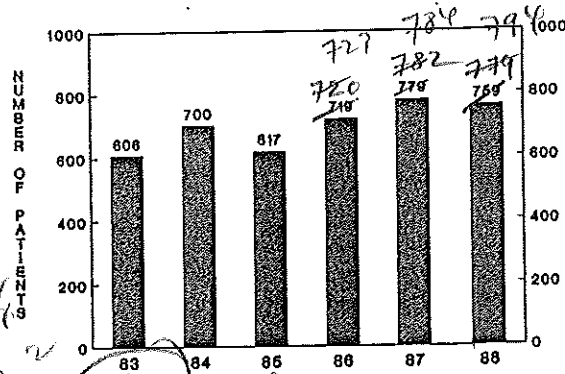
Figure 2.

STOCK AND FLOW - AUSTRALIA 1983-1988

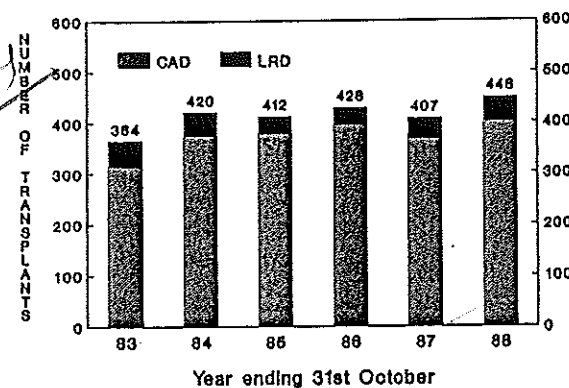
LIVING TRANSPLANT AND DIALYSIS



NEW PATIENTS



TRANSPLANTS PERFORMED



DEATHS

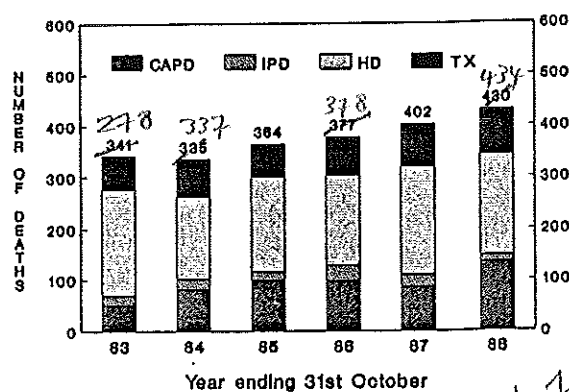


TABLE 2

STOCK OF PATIENTS

	31.10.83	31.10.84	31.10.85	31.10.86	31.10.87	31.10.88
NUMBER FUNCTIONING TRANSPLANTS	1771 (115)	1975 (127)	2164 (137)	2390 (150)	2583 (159)	2801 (169)
NUMBER OF DIALYSIS PATIENTS	1965 (128)	2108 (136)	2174 (138)	2298 (144)	2467 (152)	2598 (157)
PROPORTION DIALYSING AT HOME	54%	54%	52%	51%	52%	52%
PROPORTION SATELLITE	10%	10%	13%	14%	16%	16%
PROPORTION CAPD	23%	28%	27%	28%	30%	30%

PATIENT FLOW SUMMARY

	1.11.82- 31.10.83	1.11.83- 31.10.84	1.11.84- 31.10.85	1.11.85- 31.10.86	1.11.86- 31.10.87	1.11.87- 31.10.88
NUMBER OF NEW PATIENTS	606 (39)	700 (45)	616 40 617 (39)	723 719 (45)	784 779 (48)	857 48 759 (46)
NUMBER OF NEW TRANSPLANTS	364 (24)	420 (27)	412 (26)	428 (27)	407 (25)	448 (27)
LIVING DONOR TRANSPLANTS	50	46	34	33	40	47
NON PRIMARY TRANSPLANTS	77	79	92	77	78	78
NUMBER OF DEATHS	278	336	364	378	402	434
DIALYSIS PATIENTS	213	263	300	305	320	343
TRANSPLANT PATIENTS	65	73	64	73	82	87

() Number of patients per million population.

Figure 3.

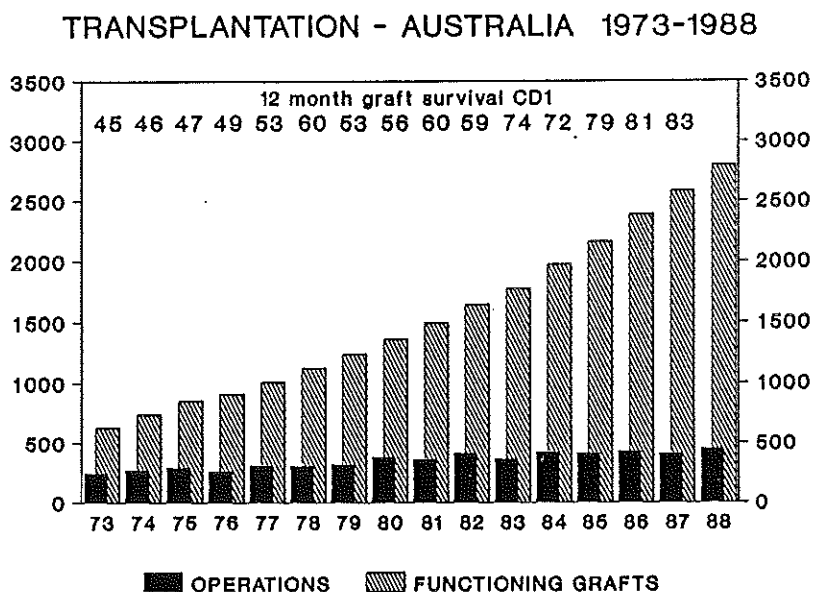


Figure 4.

PRIMARY CADAVER PATIENT AND GRAFT SURVIVAL
Related to recipient age 1985-1988

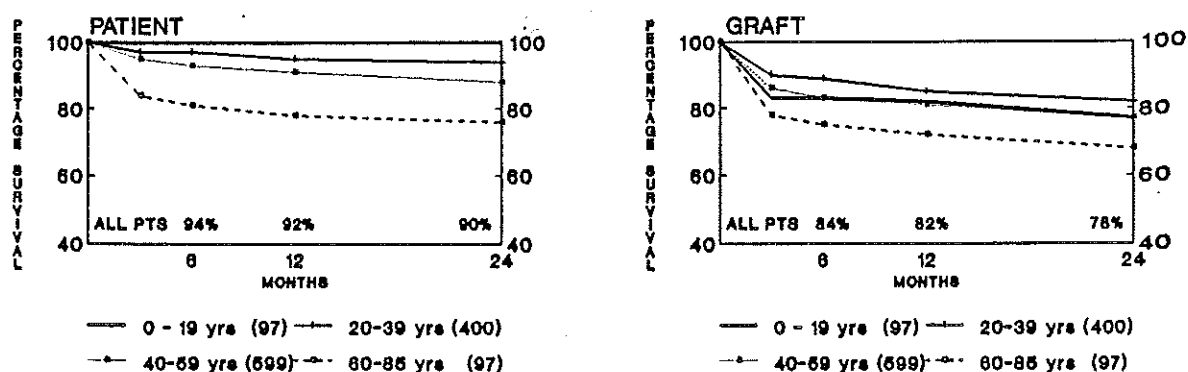


Figure 5.

PRIMARY CADAVER GRAFT SURVIVAL
Related to sensitisation 1981-1984, 1985-1988

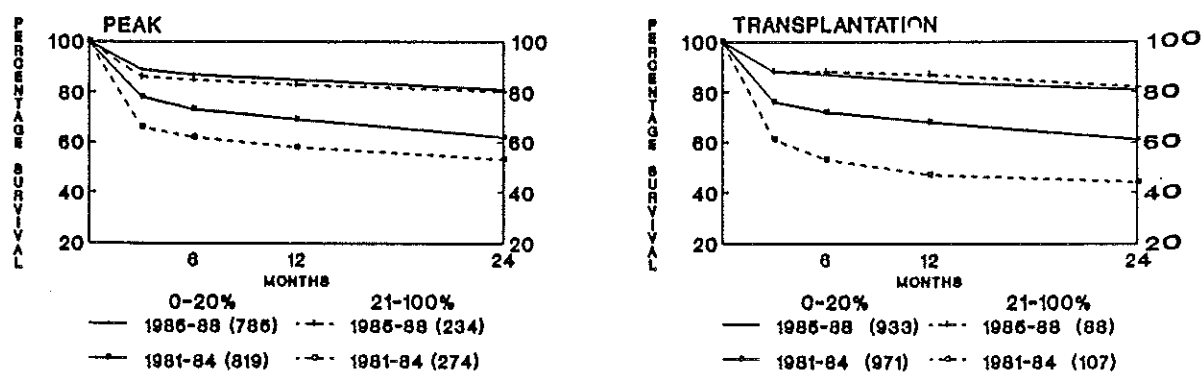


Figure 6.

PATIENT AND TECHNIQUE DIALYSIS SURVIVAL Related to age at entry 1985-1988

C.A.P.D.

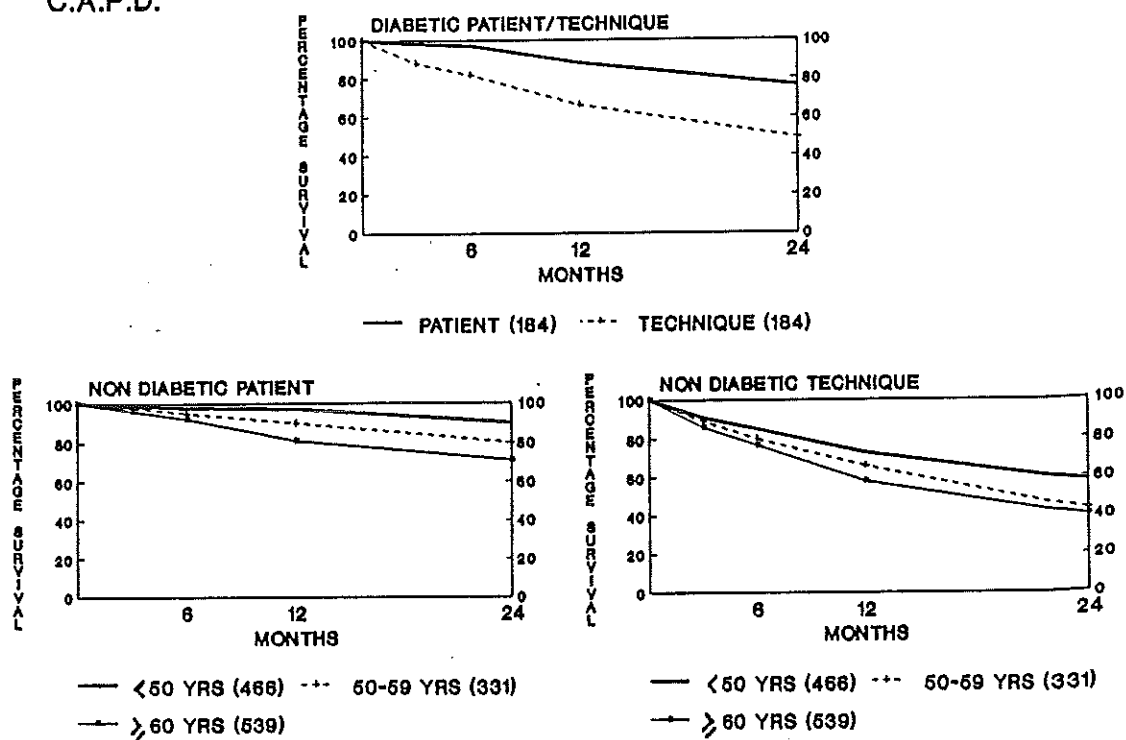


Figure 7.

HAEMODIALYSIS

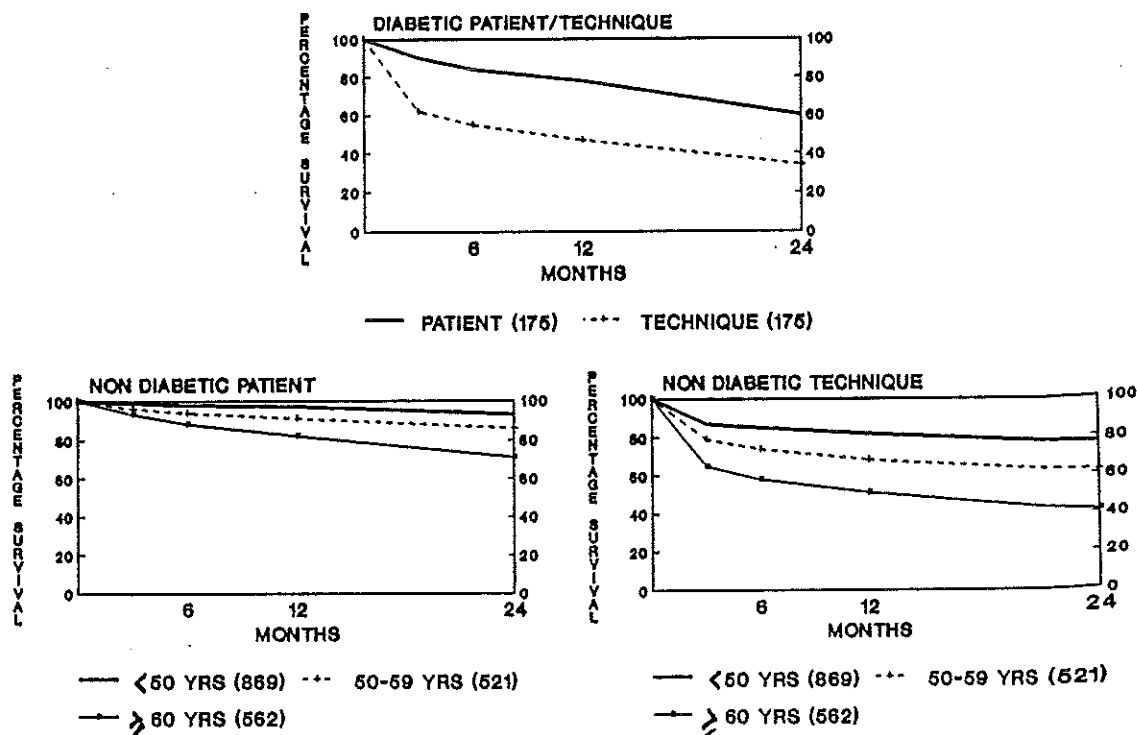


TABLE 3

INDIVIDUAL STATE STOCK AND FLOW 1.11.87-31.10.88

STATE	NEW PATIENTS	NEW TRANSPLANTS	DIALYSIS DEATHS	TRANSPLANT DEATHS	ON DIALYSIS	FUNCT. TX (HOSPITAL)	TOTAL
AUSTRALIA	~~779~~ 759 (779) ⁷⁸²	448 (407)	~~345~~ 343 (320) ^x	~~87~~ 87 (82) ^x	2598 (2467)	2801 (2583)	5399 (5050)
QUEENSLAND	~~125~~ 125 (146) ^x	94 (70)	59 (48)	22 (12)	380 (382)	466 (409)	846 (791)
NEW SOUTH WALES	~~312~~ 307 (312) ^x	157 (119)	~~145~~ 144 (156) ^x	~~33~~ 32 (32) ^x	1100 (1039)	1043 (964)	2143 (2003)
VICTORIA	~~170~~ 165 (188) ^x	119 (133)	~~77~~ 76 (64)	~~18~~ 17 (19) ^x	625 (599)	741 (695)	1366 (1294)
SOUTH AUSTRALIA	71 (63) ^x	45 (49)	32 (24)	8 (13) ^x	239 (231)	312 (289)	551 (520)
NORTHERN TERRITORY [*]	8 (13)	- -	3 (1)	2 -	20 (18)	- -	20 (18)
WESTERN AUSTRALIA	~~70~~ 64 (44)	33 (36)	22 (21)	~~34~~ 34 (5)	191 (165)	237 (223)	428 (388)
TASMANIA	19 (13)	- -	7 (6)	3 (1)	43 (33)	2 (3)	45 (36)

() 1987 October figures.

^x Adjusted with additional data supplied in 1988.

- ^{*} 6 Northern Territory residents received initial treatment in South Australia 1988.
 10 Northern Territory residents received initial treatment in South Australia 1987.
 1 Northern Territory resident received initial treatment in New South Wales 1987.

NEW PATIENTS 1988

LIKELIHOOD OF TRANSPLANTATION
31.10.88

REHABILITATION 31.10.88

QUALITY OF LIFE ASSESSMENT
31.10.88

DEATHS 1988

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NEW PATIENTS

PATIENTS COMMENCING TREATMENT IN 1988

There was a 3% decrease in the number of new patients treated during the twelve month period to 31st. October, 1988: 759 new cases, 46 per million population. See Table 4.

The regional distribution ranged from 51 per million (New South Wales, South Australia, Northern Territory) down to 39 per million (Victoria). Western Australia reversed the sharp decline seen in the previous year.

TABLE 4

ANNUAL INTAKE OF NEW PATIENTS

STATE	1984	1985	1986	1987	1988
QUEENSLAND	112 (45)	108 (43)	117 (45)	146 (54)	125 (46)
NEW SOUTH WALES	299 (53)	246 (43)	295 (51)	312 (53)	307 (51)
VICTORIA	139 (35)	134 (34)	182 (44)	188 (45)	165 (39)
SOUTH AUSTRALIA	72 (55)	61 (44)	50 (36)	63 (45)	71 (51)
WESTERN AUSTRALIA	61 (44)	47 (34)	52 (37)	44 (29)	64 (42)
TASMANIA	12 (28)	6 (14)	11 (24)	13 (29)	19 (42)
NORTHERN TERRITORY*	5 (4) (38)	15 (14) (107)	12 (9) (86)	13 (9) (81)	9.8 (6) (51)
AUSTRALIA	700 (46)	617 (40)	719 (45)	779 (48)	759 (46)

() Per million population.

* These Northern Territory residents received initial treatment in South Australia.

When excluding patients with analgesic nephropathy, there were 668 new patients (40 per million). Regional distribution ranged from 47 per million (South Australia) to 37 per million (Western Australia). Victoria (38 per million), having retreated from last year's figure (43), was again surpassed by New South Wales (42 per million) and Queensland (40 per million). See Table 5 and Figures 8 and 9.

TABLE 5

INDIVIDUAL STATES: 1988

	QUEENSLAND	NEW SOUTH WALES	VICTORIA	SOUTH AUSTRALIA	WESTERN AUSTRALIA	TASMANIA	NORTHERN TERRITORY
ANALGESIC	17 (6)	56 (9)	14 (1)	5 (4)	8 (5)	1 (2)	-
NON-ANALGESIC	108 (40)	251 (42)	161 (38)	66 (47)	56 (37)	18 (40)	8 (40)
TOTAL	125 (46)	307 (51)	165 (39)	71 (51)	64 (42)	19 (42)	8 (40)

AUSTRALIA: 1978-1988

	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
ANALGESIC	93 (7)	94 (7)	122 (8)	102 (7)	112 (8)	110 (7)	117 (8)	96 (6)	90 (6)	108 (7)	91 (6)
NON-ANALGESIC	394 (27)	384 (26)	425 (30)	465 (32)	445 (29)	496 (33)	583 (38)	520 (34)	629 (39)	671 (41)	668 (40)
TOTAL	487 (34)	478 (33)	547 (38)	567 (39)	557 (37)	606 (40)	700 (46)	617 (40)	719 (45)	779 (48)	759 (46)

() Number of patients per million population.

Figure 8.

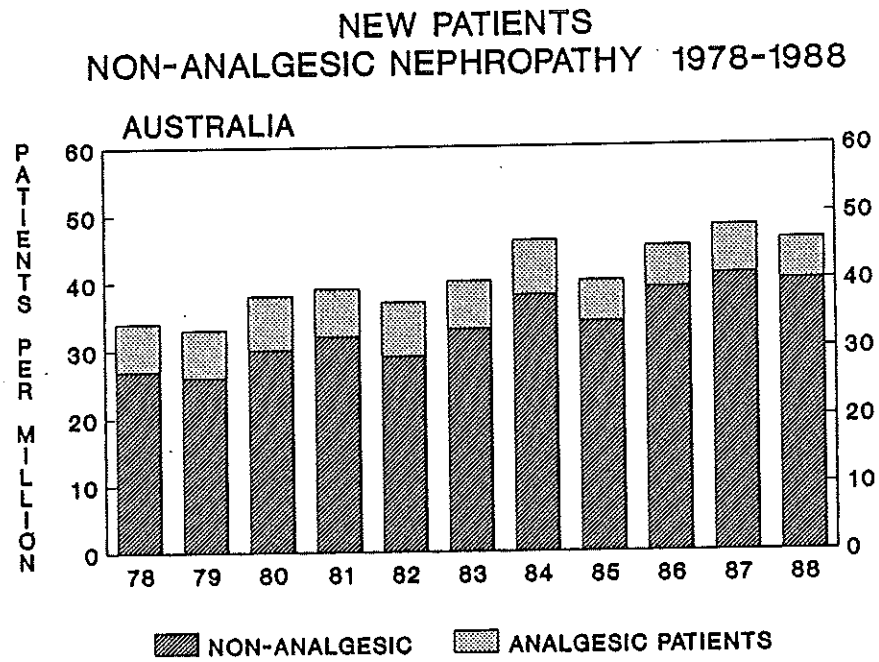
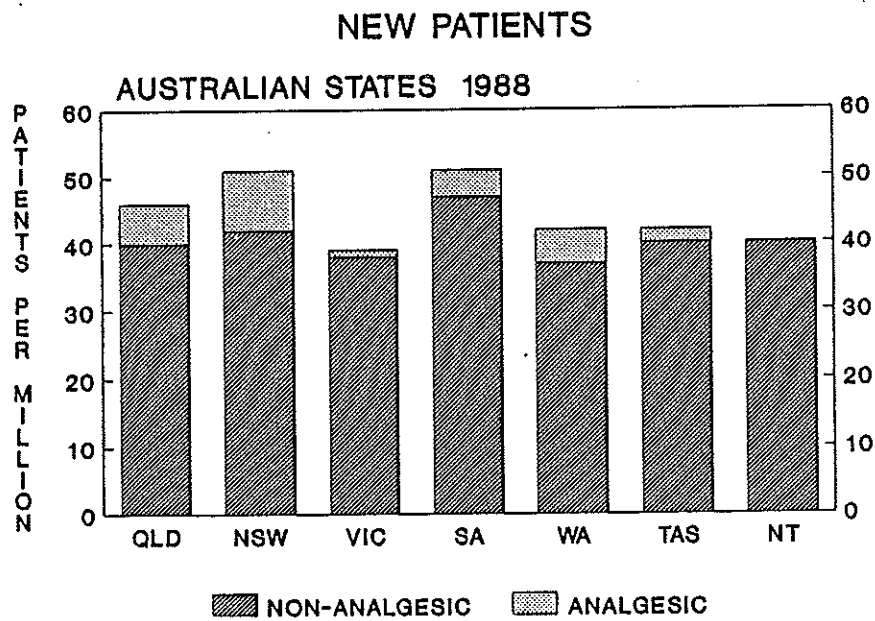


Figure 9.



AGE OF NEW PATIENTS:

The age and sex of patients who commenced treatment in each Australian State during the twelve month period 1st. November, 1987 to 31st. October, 1988 is shown in Table 6.

The largest group was aged 60-69 years (195 cases, 25% of total), followed by those aged 50-59 years (173 cases, 23%). Growing rapidly was the 70-79 year age group, now 8% of new cases, which doubled the number commencing treatment two years earlier, shown in Figure 10.

Proportion of elderly patients:

Further evaluation of the trend in the age of new patients during the past ten years is shown in Table 7 and Figure 11. The number of young and middle aged patients (<60 years old), related to total Australian population, has fluctuated about 30 patients per million since 1978. Older patients have entered in such increasing numbers during the past five years that 33% of new cases were aged over 60 years, compared to 18% five years earlier (1982-1983) and 10% ten years earlier (1977-1978).

The individual State age distribution for 1988, shown in Figure 12, shows a range for patients >60 years of age, from 22 per million (South Australia, New South Wales) to 10 per million (Victoria).

TABLE 6

AGE AND SEX OF NEW PATIENTS 1.11.87-31.10.88

STATE	0-9 YEARS (n=12)		10-19 YEARS (n=24)		20-29 YEARS (n=66)		30-39 YEARS (n=81)		40-49 YEARS (n=143)		50-59 YEARS (n=173)		60-69 YEARS (n=195)		70-79 YEARS (n=64)		80-89 YEARS (n=1)		TOTAL (n=759)	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
QUEENSLAND	-	-	-	1	6	4	10	8	14	11	21	15	17	8	8	2	-	-	76	49
NEW SOUTH WALES	1	3	6	1	16	16	11	13	32	19	24	42	47	52	12	11	1	-	150	157
VICTORIA	4	1	6	8	7	5	11	10	27	8	22	14	20	13	8	1	-	-	105	60
SOUTH AUSTRALIA	1	1	1	-	4	1	7	1	6	3	10	5	15	7	8	1	-	-	52	19
NORTHERN TERRITORY*	-	-	-	-	-	1	3	1	-	3	-	-	-	-	-	-	-	-	3	5
WESTERN AUSTRALIA	-	1	-	1	3	2	3	2	11	4	6	10	4	6	8	3	-	-	35	29
TASMANIA	-	-	-	-	-	1	1	-	1	4	2	2	5	1	2	-	-	-	11	8
AUSTRALIA	6	6	13	11	36	30	46	35	91	52	85	88	108	87	46	18	1	-	432	327

* 6 Northern Territory residents started initial treatment in South Australia.

Figure 10.

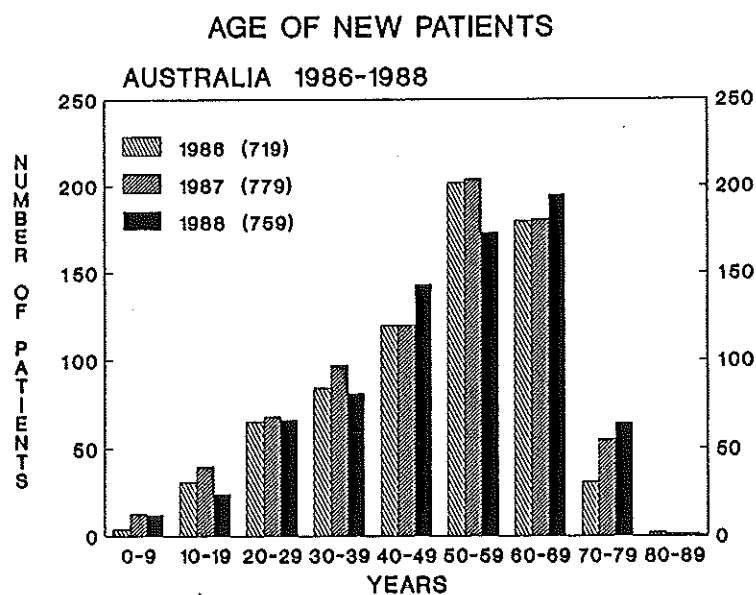


Figure 11.

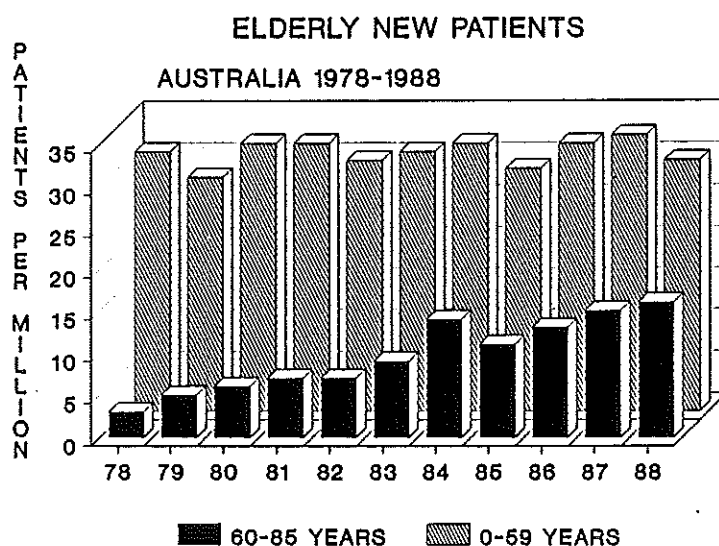
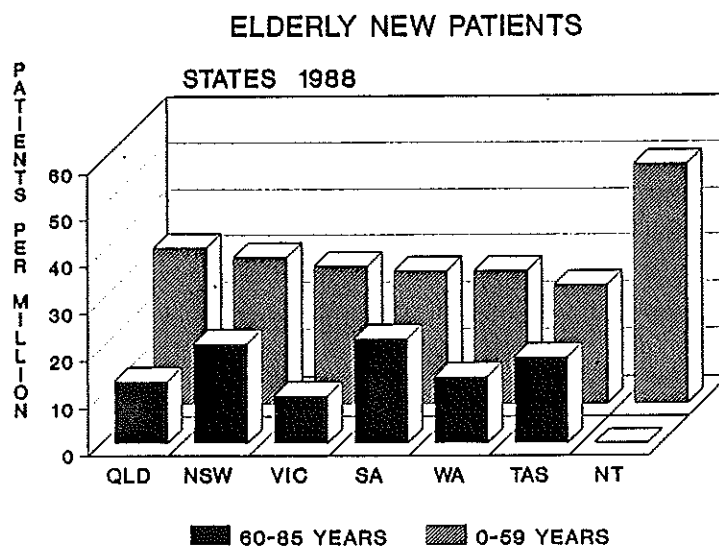


Figure 12.



SQ LREP - SYSTEM/MANAGER

RUNREP Test1 - system/MANAGER

TABLE 7

AGE DISTRIBUTION OF NEW PATIENTS

1977 - 1978

STATE	AGE GROUP								
	0-9 YEARS	10-19 YEARS	20-29 YEARS	30-39 YEARS	40-49 YEARS	50-59 YEARS	60-69 YEARS	70-79 YEARS	80 + YEARS
QUEENSLAND	1	8	19	17	30	33	11	1	-
NEW SOUTH WALES	5	24	38	75	100	155	45	5	-
VICTORIA	2	12	33	38	60	53	12	1	-
SOUTH AUSTRALIA & NORTHERN TERRITORY	1	4	17	9	11	29	12	2	-
WESTERN AUSTRALIA	-	7	12	6	16	15	4	-	-
TASMANIA	-	2	5	3	3	1	-	-	-
AUSTRALIA	9	57	124	148	220	286	84	9	-

1982 - 1983

STATE	0-9 YEARS	10-19 YEARS	20-29 YEARS	30-39 YEARS	40-49 YEARS	50-59 YEARS	60-69 YEARS	70-79 YEARS	80 + YEARS
QUEENSLAND	2	12	14	29	35	50	28	1	-
NEW SOUTH WALES	12	21	51	63	107	154	105	20	-
VICTORIA	7	18	30	41	58	55	27	-	-
SOUTH AUSTRALIA & NORTHERN TERRITORY	2	6	9	13	13	29	23	8	1
WESTERN AUSTRALIA	2	9	8	16	18	17	17	5	-
TASMANIA	-	1	2	4	4	7	6	-	-
AUSTRALIA	25	67	114	166	235	312	206	34	1

1987 - 1988

STATE	0-9 YEARS	10-19 YEARS	20-29 YEARS	30-39 YEARS	40-49 YEARS	50-59 YEARS	60-69 YEARS	70-79 YEARS	80 + YEARS
QUEENSLAND	3	11	20	~~38~~ ³⁹	~~44~~ ⁴⁵	78	61	~~18~~ ¹⁶	-
NEW SOUTH WALES	7	21	48	55	~~94~~ ⁹⁵	~~155~~ ¹⁵⁸	~~185~~ ¹⁸⁸	53	2
VICTORIA	11	24	~~37~~ ³⁸	47	~~72~~ ⁷⁴	~~78~~ ⁷⁹	~~67~~ ⁶⁹	17	-
SOUTH AUSTRALIA & NORTHERN TERRITORY	2	5	15	26	24	31	35	16	-
WESTERN AUSTRALIA	2	3	~~11~~ ¹²	10	~~22~~ ²⁵	26	~~20~~ ²²	14	-
TASMANIA	-	-	3	2	7	9	8	3	-
AUSTRALIA	25	64	~~134~~ ¹³⁶	~~178~~ ¹⁷⁹	~~263~~ ²⁷⁰	~~377~~ ³⁸¹	~~376~~ ³⁸³	~~119~~ ¹²¹	2

PRIMARY RENAL DISEASE

The number of new cases with glomerulonephritis increased, but the number in all other categories decreased. There were 77 cases of diabetic nephropathy, 44 were insulin dependent, 33 non-insulin dependent. IgA glomerulonephritis increased to 53 cases (3.2 per million), maintaining the trend established since 1981.

For details of age of new patients in each State see Tables in the Appendix.

TABLE 8

PRIMARY RENAL DISEASE 1984-1988 *

PRIMARY RENAL DISEASE	1984	1985	1986	1987	1988
GLOMERULONEPHRITIS	34% (239)	35% (219)	36% (259)	32% (252)	38% (288)
ANALGESIC NEPHROPATHY	17% (117)	16% (96)	12% (90)	14% (108)	12% (91)
POLYCYSTIC DISEASE	7% (47)	9% (57)	11% (80)	8% (59)	7% (52)
REFLUX NEPHROPATHY	6% (44)	8.9% (53)	7% (50)	9% (69)	6% (47)
HYPERTENSION	4% (32)	5.4% (28)	5% (36)	5% (42)	6% (44)
DIABETIC NEPHROPATHY	10% (67)	8% (47)	10% (70)	11% (86)	10% (77)
MISCELLANEOUS	14% (98)	12.13% (76)	11% (78)	13% (100)	12% (94)
UNCERTAIN	8% (56)	7.6% (41)	8% (56)	8% (63)	9% (66)
TOTAL	100% (700)	100% (617)	100% (719)	100% (779)	100% (759)

* 12 months ending 31st. October.

() Number of patients in brackets.

Analgesic nephropathy cases decreased once again to the 1986 level: the lowest since 1979. The 91 cases (5.5 per million) represented 12% of the year's total intake of new patients. Western Australia showed a large increase to 5.2 patients per million: Queensland 6.2 per million and New South Wales 9.4 per million.

Disappointingly, twelve cases were in the 40-49 year age group: nine in New South Wales, three in Queensland. More encouraging was the fall in the older age group in both Queensland and New South Wales.

TABLE 9

TYPES OF GLOMERULONEPHRITIS 1.11.87-31.10.88

	AUSTRALIA 295 288 PATIENTS	
NO BIOPSY	22%	(64) 65
FOCAL SCLEROSING	13%	(37) 39
MCGN I (SUBENDOTHELIAL DEPOSITS)	6%	(16)
MEMBRANOUS GN	7%	(20)
RAPIDLY PROGRESSIVE GN	3%	(9)
MESANGIO PROLIFERATIVE - IgA +	18%	(53) 56
- IgA -	3%	(8)
- No I.F.	2%	(7)
FOCAL AND SEGMENTAL PROLIFERATIVE GN	3%	(9) 10
ADVANCED GN (END-STAGE TYPE)	6%	(18)
GN WITH SYSTEMIC DISEASE	1%	(3)
GOODPASTURE'S SYNDROME	2%	(7)
ANTI-GBM (no haemoptysis)	1%	(2)
S.L.E.	5%	(14)
HENOCH-SCHONLEIN PURPURA	1%	(2)
WEGENER'S GRANULOMATOSIS	2%	(5)
POLYARTERITIS NODOSA	1%	(4)
SCLERODERMA	1%	(2)
GN OTHER	1%	(2)
FAMILIAL GN	2%	(6)

() Number of patients

TABLE 10

MISCELLANEOUS CAUSES OF PRIMARY RENAL DISEASE 1.11.87-31.10.8897
(94 PATIENTS)

INTERSTITIAL NEPHRITIS	11	CALCULI	6
LEAD NEPHROPATHY	4	OXALOSIS	2
PYELONEPHRITIS	4	CYSTINOSIS	1
GOUT	2		
IRRADIATION NEPHROPATHY	1		
		AMYLOID	12 10
BLADDER NECK OBSTRUCTION (INCLUDING PROSTATOMEGALY)	4	CONGENITAL RENAL HYPOPLASIA AND DYSPLASIA	7
OTHER LOWER URINARY TRACT ABNORMALITIES (WITH SECONDARY REFLUX)	3	OLIGOMEGANEPHRONIA	1
NEUROPATHIC BLADDER	2		
MEGAURETER	2	MULTIPLE MYELOMA	9
PELVI-URETERIC JUNCTION OBSTRUCTION	2	TRANSITIONAL CELL CARCINOMA	3
OBSTRUCTIVE UROPATHY (UNSPECIFIED)	1	RENAL CELL CARCINOMA	2
POSTERIOR URETHRAL VALVES	1		
NON-OBSTRUCTED DILATED BLADDER AND URETERS	1	MEDULLARY CYSTIC DISEASE	4
SPINA BIFIDA OR MYELOMENINGOCELE	1	MULTICYSTIC KIDNEY DISEASE	1
		MULTICYSTIC DYSPLASTIC	1
CORTICAL NECROSIS	2	HAEMOLYTIC URAEMIC SYNDROME	5
(R) VEIN THROMBOSIS (L) PAPILLARY NECROSIS	1		
FABRY'S DISEASE	1		

Figure 13.

ANALGESIC NEPHROPATHY 1977-1988

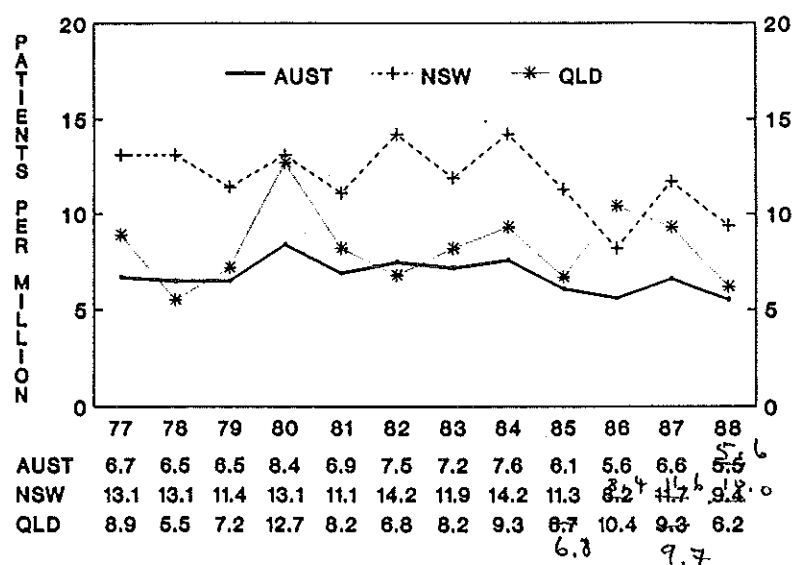
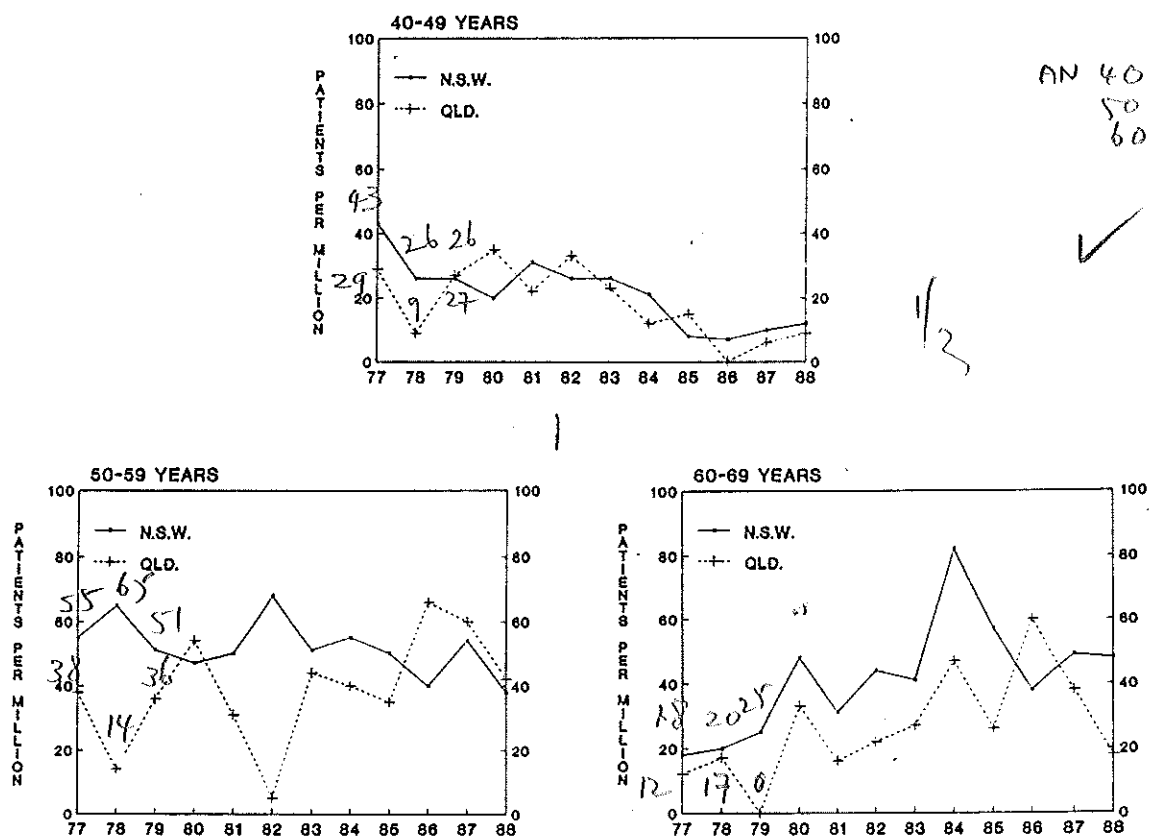


Figure 14.

AGE AND ANALGESIC NEPHROPATHY



ANNUAL PROPORTION OF NEW PATIENTS WITH ANALGESIC NEPHROPATHY 1977-1988

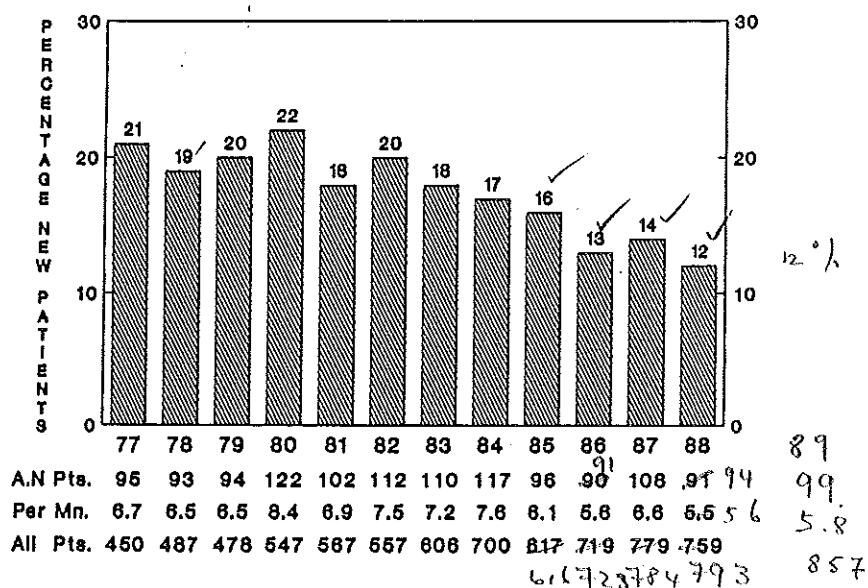


TABLE 11

NUMBER OF NEW PATIENTS

STATE	1983	1984	1985	1986	1987	1988	1989
QUEENSLAND	20	23	17	27	25	17	22
NEW SOUTH WALES	66	80	64	48	69	56	64
VICTORIA	11	5	5	9	4	4	6
SOUTH AUSTRALIA	5	4	6	3	6	5	3
WESTERN AUSTRALIA	8	5	3	3	2	8	4
TASMANIA	-	-	1	-	2	1	-
NORTHERN TERRITORY	-	-	-	-	-	-	-
AUSTRALIA	110	117	96	90	108	91	99

PERCENTAGE OF NEW PATIENTS

STATE	1983	1984	1985	1986	1987	1988	1989
QUEENSLAND	22%	21%	16%	23%	17%	14%	16%
NEW SOUTH WALES	24%	27%	26%	16%	22%	18%	18%
VICTORIA	9%	4%	4%	5%	2%	2%	3%
SOUTH AUSTRALIA	10%	5%	8%	5%	10%	7%	4%
WESTERN AUSTRALIA	14%	8%	6%	6%	5%	13%	5%
TASMANIA	-	-	17%	-	15%	5%	-
NORTHERN TERRITORY	-	-	-	-	-	-	-
AUSTRALIA	18%	17%	15%	13%	14%	12%	12%

PATIENTS PER MILLION POPULATION

STATE	1983	1984	1985	1986	1987	1988	1989
QUEENSLAND	8.2	9.3	6.8	10.4	9.3	6.2	7.7
NEW SOUTH WALES	11.9	14.2	11.3	8.3	11.6	9.4	10.5
VICTORIA	2.7	1.2	1.2	2.2	0.9	0.9	1.3
SOUTH AUSTRALIA	3.7	2.9	4.4	2.1	4.3	3.8	2.1
WESTERN AUSTRALIA	5.9	3.6	2.1	2.1	1.3	3.2	2.5
TASMANIA	-	-	2.2	-	4.4	2.2	-
NORTHERN TERRITORY	-	-	-	-	-	-	-
AUSTRALIA	7.2	7.6	6.1	5.6	6.6	5.5	5.8

LIKELIHOOD OF TRANSPLANTATION

PATIENTS AWAITING TRANSPLANTATION AT OCTOBER 1988

The likelihood of transplantation for patients receiving dialysis treatment at the end of the survey period on the 31st. October 1988 is shown in Table 12. The form and location of dialysis are included. Only 33% (852 patients) were "fit, non-sensitised", the majority dialysing out of the hospital; a further 12% (315 patients) had significant cytotoxic antibody reactivity.

25% (645 patients) were not considered for transplantation due to their age. The pool of elderly patients had increased by 92% from 1983: (335 patients) to 1988 (645 patients).

TABLE 12

TRANSPLANT LIKELIHOOD: 31.10.88

LIKELIHOOD OF TRANSPLANTATION			HAEMODIALYSIS			PERITONEAL DIALYSIS			
			HOSP	HOME	SAT	CAPD	IPD		
							HOSP	HOME	SAT
FIT NON-SENSITISED PATIENT	852	(33%)	218	239	128	257	4	6	-
SENSITISED Ab > 20% OR < 60%	102	(4%)	30	21	28	23	-	-	-
SENSITISED Ab > 60%	165	(6%)	36	53	52	23	1	-	-
EXCELLENT MATCH REQUIRED	48	(2%)	23	16	4	3	1	1	-
REFUSAL TO HAVE TRANSPLANT	179	(7%)	43	49	37	49	1	-	-
TECHNICAL DIFFICULTIES	55	(2%)	20	14	10	10	-	1	-
RECURRENT NEPHRITIS IN GRAFT	10	(<1%)	3	1	4	1	-	1	-
AGE	645	(25%)	217	89	72	257	6	3	1
CHRONIC OBSTRUCTIVE AIRWAYS DISEASE	19	(1%)	6	3	4	6	-	-	-
BRONCHIECTASIS	7	(<1%)	2	5	-	-	-	-	-
SEVERE ISCHAEMIC HEART DISEASE	168	(6%)	55	23	23	63	2	2	-
MALIGNANCY	94	(4%)	27	19	28	19	-	-	1
OTHER REASONS	254	(10%)	92	40	36	79	2	5	-
TOTAL PATIENTS	2598	(100%)	772	572	426	790	17	19	2

TRANSPLANT OPERATIONS RELATED TO POOL OF POTENTIAL RECIPIENTS

The number of transplant operations performed each year from 1982-1988, compared to the number of waiting potential recipients throughout the same period is shown in Figure 16. The number of patients awaiting a transplant was taken to be the sum of those transplanted during the year, those coded (at the end of the year) as likely to be transplanted and those likely to be transplanted who died during the year.

The number of dialysis patients likely to be transplanted, as coded for the annual survey (10,20,21,30) had increased by 45% since 1982. During the same period the number of transplant operations had increased by 8%. See Figure 16. The proportion of waiting patients who received a graft during each year fell from 37% (1982) to 28% (1988).

Comment

Increasing the number of transplant operations to 600 per year and assuming that 50% of the new patients each year are likely to be awaiting a transplant, then the waiting list should be cleared in seven years. Such a target requires an increase of 30% in the annual transplantation rate: New South Wales 60 extra transplants a year, Victoria 40, Queensland 30, Western Australia 15, South Australia 15.

Figure 16.

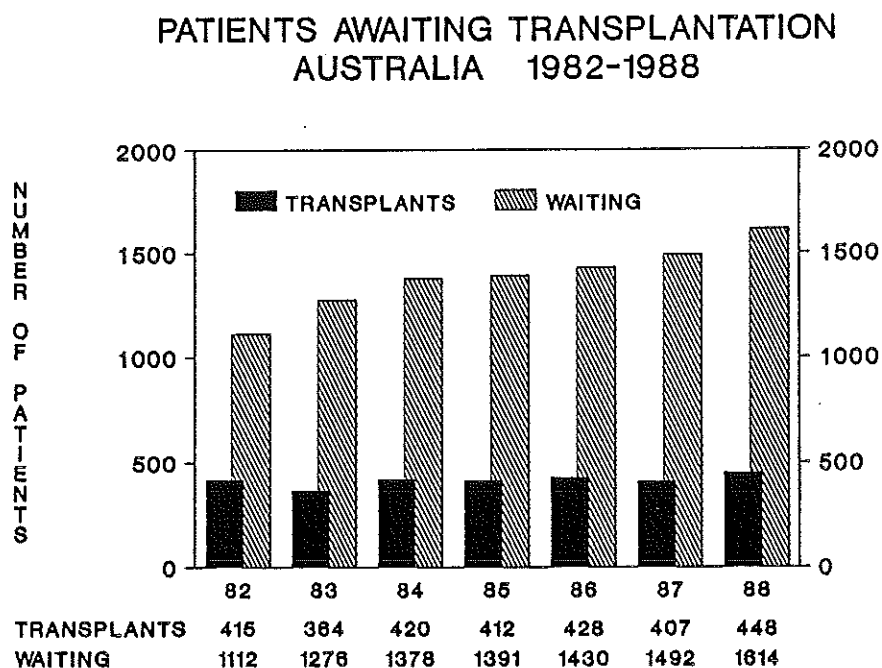
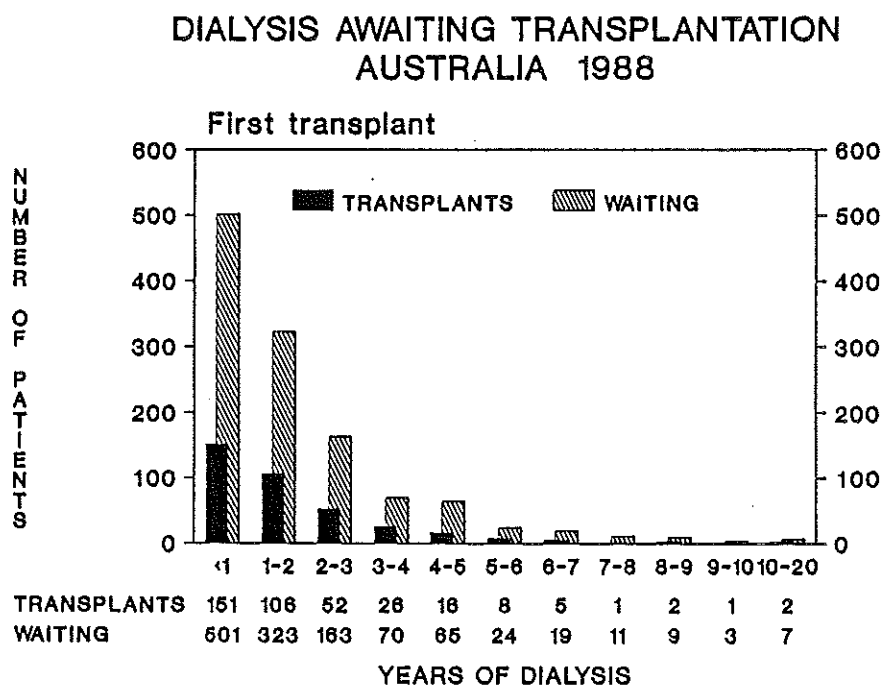


Figure 17.



PERIOD OF DIALYSIS BEFORE TRANSPLANTATION

During 1988 the period of dialysis before transplantation of patients receiving a first or second graft was compared with the duration of dialysis for all patients awaiting a first or second transplant during the year.

First grafts

The median dialysis period of patients awaiting a first graft was between one and two years. 42% of patients had dialysed for less than one year, a further 26% for one to two years, 25% two to five years and only 7% over five years. See Figure 17.

There were 370 patients transplanted of the 1250 awaiting a first graft; 41% within a year, 29% less than two years, 25% two to five years, 5% for up to 14 years of dialysis.

Registry survey returns suggest that 85% of those likely to be transplanted had either low (<20% panel reactive) or no cytotoxic antibodies, a further 10% had antibodies which were reactive to 20-59% of a random cell panel and 5% were highly sensitised (60-100% random cell panel).

Thirty eight patients were waiting more than five years for transplantation of whom 65% were reported to be in the 0-19% panel reactive category, 10% in 20-59% reactive and 25% highly sensitised (>60%).

Comment

Distribution of the "waiting time" period of transplanted patients was not notably different from that of the pool awaiting a graft. There seems to be little evidence of "skimming off" patients after short periods of dialysis.

Second grafts

There were 403 patients awaiting a second (or subsequent graft), 18% for less than one year, 17% for one to two years, 32% for two to five years, 28% for five to ten years and 5% more than ten years: median was three to four years.

Many of these patients had considerable random cell panel current antibody reactivity: 13% (20-59% reactivity), 29% (60-100% reactivity).

Sixty two patients received a second graft, after periods of dialysis up to 14 years: 17% for less than one year, 25% for one to two years, 31% two to five years, 25% five to ten years and 3% for more than ten years.

REHABILITATIONDialysis dependent

The assessment of rehabilitation, measured as "capacity to work" related to form of dialysis treatment is shown in Table 13. 27% of patients were "working" full time, 18% part time, 17% "retired" and 24% too sick to work. 10% were fit for work but unemployed due to lack of opportunity (5%) or disinclination (5%).

In the two main treatment groups, continuous ambulatory peritoneal dialysis and haemodialysis (hospital, satellite, home) 27%, 20%, 28%, and 40% respectively were working full time, 22%, 15%, 14% and 16% were "retired" and 22%, 34%, 20% and 13% were too sick.

There has been a relative decline in the proportion of fit, full or part time "workers" over the last three years, replaced by increases in the sick and retired categories reflecting the aging of the dialysis population.

Transplant dependent

While the majority (63%) of patients with a functioning transplant were "working" full time, 6% were sick, 6% were retired and 4% disinclined. Comparison with recent years shows a slight shift from full time work to the "retired" category.

TABLE 13

REHABILITATION GRADING: 31.10.88

TYPE OF TREATMENT	10	20	30	40	50	60	70	90	100	TOTAL
<u>DIALYSIS</u>										
HOSPITAL PD	-	1	-	2	1	11	1	1	-	17
SATELLITE PD	-	-	-	-	-	1	1	-	-	2
HOME PD	2	2	-	-	-	6	2	7	-	19
HOSPITAL CAPD	3	-	1	3	-	21	3	2	-	33
HOME CAPD	203	128	16	10	24	170	164	30	12	757
HOSPITAL HD	153	143	20	27	34	261	115	14	5	772
SATELLITE HD	119	98	13	15	34	87	59	1	-	426
HOME HD	231	96	21	5	28	73	91	-	27	572
TOTAL	711 (27%)	468 (18%)	71 (3%)	62 (2%)	121 (5%)	630 (24%)	436 (17%)	55 (2%)	44 (2%)	2598
FUNCTIONING TRANSPLANTS	1761 (63%)	346 (12%)	82 (3%)	- -	102 (4%)	160 (6%)	171 (6%)	102 (4%)	88 (2%)	2812 [*]
TOTAL	2472 (46%)	814 (15%)	153 (3%)	62 (1%)	223 (4%)	790 (15%)	607 (11%)	157 (3%)	132 (2%)	5410

* Total as for caring hospital.

- 10 = Able to work and working full time (including full time housework)
 20 = Able to work and working part time.
 30 = Able to work, but not yet working due to inability to get a job.
 40 = Able to work, but not yet working due to dialysis schedule.
 50 = Able to work, but not yet working due to disinclination.
 60 = Medically unfit for work or home duties.
 70 = Able to work, but retired.
 90 = Paediatric patient < 15 years or still at school. (Refer to Paediatric Table)
 100 = Unknown or lost to follow up.

QUALITY OF LIFE ASSESSMENTDialysis dependent

As in previous years self-care patients, especially those using haemodialysis, were less disabled than hospital based haemodialysis patients. These results should be interpreted with due allowance for the selection of appropriate treatment for an individual patient. "Sick" patients are not likely to dialyse at home.

45% of all dialysis patients were capable of normal activity with little or no effort, and an additional 28% with some effort. 13% of patients could care for themselves without assistance and a further 10% with occasional to moderate assistance. Only 2% were severely disabled.

Transplant dependent

While 92% can manage normal activity with varying degrees of effort, only half of them can do so without restriction. No trend is evident when these results were compared with previous years.

TABLE 14

QUALITY OF LIFE ASSESSMENT AT 31.10.88

TYPE OF TREATMENT	100	90	80	70	60	50	40	30	20	10	00	TOTAL
<u>DIALYSIS</u>												
HOSPITAL PD	2	-	3	5	3	3	1	-	-	-	-	17
SATELLITE PD	-	-	1	-	-	-	1	-	-	-	-	2
HOME PD	2	5	6	-	1	3	2	-	-	-	-	19
HOSPITAL CAPD	4	5	4	4	3	8	4	1	-	-	-	33
HOME CAPD	103	230	223	103	44	31	7	2	2	-	12	757
HOSPITAL HD	49	227	216	134	71	43	14	5	6	2	5	772
SATELLITE HD	39	169	139	47	20	10	2	-	-	-	-	426
HOME HD	79	240	141	49	19	10	5	1	1	-	27	572
TOTAL	278 (11%)	876 (34%)	733 (28%)	342 (13%)	161 (6%)	108 (4%)	36 (1%)	9 (<1%)	9 (<1%)	2 (<1%)	44 (2%)	2598
FUNCTIONING TRANSPLANTS	1350 (48%)	924 (33%)	313 (11%)	80 (3%)	24 (1%)	14 (<1%)	9 (<1%)	2 (<1%)	7 (<1%)	1 (<1%)	88 (3%)	2812*
TOTAL	1628 (30%)	1800 (33%)	1046 (19%)	422 (8%)	185 (3%)	122 (2%)	45 (1%)	11 (<1%)	16 (<1%)	3 (<1%)	132 (2%)	5410

* Total as for caring hospital.

- 100 = Normal: No complaints, no evidence of disease.
 90 = Able to carry on normal activity, minor signs or symptoms of disease.
 80 = Normal activity with effort, some signs or symptoms of disease.
 70 = Care for self; unable to carry on normal activity or do active work.
 60 = Requires occasional assistance but able to care for most needs.
 50 = Requires considerable assistance and frequent medical care.
 40 = Disabled; requires special care and assistance.
 30 = Severely disabled; hospital care indicated but death not imminent.
 20 = Very sick, hospital care needed.
 10 = Moribund, fatal process progressing rapidly.
 00 = Unknown or lost to follow up.

DEATHSDIALYSIS DEPENDENT

The 343 deaths represented 11% of patients treated during the past year; 58% were over 60 years, 8% under 40 years of age. The death rate, related to age of patients dialysed during the year, rose quite rapidly amongst patients over 50 years old: 12% (50-59), 15% (60-69), 25% (70-79), 57% (80-89). Refer to Appendix tables.

The number of deaths (134), related to CAPD, had increased markedly compared to the previous two years: 86 (1987), 98 (1986). 60% of these CAPD patients were over 60 years, 9% were under 40 years of age at death.

The number of haemodialysis related deaths (211), had decreased: 56% were over 60 years, 8% under 40 years old.

There was an increase in deaths due to malignancy, cardiac causes and to withdrawal of treatment; no change had occurred in the number due to cerebrovascular events or to infection. One death was attributed, in part, to dialysis dementia. No HIV death was reported.

TREATMENT WITHDRAWAL 1986-1988(a) Patients withdrawing from treatment:

During the three years 1986-1988, sixty nine patients refused further treatment, most were over 60 years old (74%), half were males; glomerulonephritis and analgesic nephropathy were the most common primary renal diseases and haemodialysis was usually the last treatment (56%).

Three transplanted patients did not return to dialysis.

Four young patients (20-29 years old) refused further treatment: two CAPD, one failed transplant and one haemodialysis: there were no diabetics.

Five diabetics refused further treatment; four males, four peritoneal dialysis, the youngest was 32 years old and one had been previously transplanted.

(b) Treatment withdrawn:

Sixty seven patients had treatment withdrawn during the same three year period 1986-1988. Most were over 60 years old (66%), most were males (58%); glomerulonephritis, diabetes and analgesic nephropathy were the most common primary renal diseases. Half of the patients were receiving haemodialysis.

One patient was not returned to dialysis after graft failure.

Four patients had multiple myeloma.

Nine of the thirteen diabetics were males, ten of the deaths occurred in 1988. Nine patients had been treated with peritoneal dialysis, one had been previously transplanted. The youngest patient was 37 years, but most were over 60 years of age.

TABLE 15

CAUSE OF DEATH - DIALYSIS DEPENDENT: 1988

CARDIAC			VASCULAR	
Myocardial infarction	78	103	Pulmonary embolus	21
Pulmonary oedema	10	6	Cerebrovascular accident	20
Hyperkalaemia	8	10	Gastrointestinal haemorrhage	2
Hypertensive cardiac failure	1	4	Haemorrhage from transplant artery	1
Cardiac arrest	43	46	Aortic aneurysm	1
Other causes of cardiac failure	13	7	Haemorrhage from elsewhere	2
TOTAL	176	153 (45%)	TOTAL	28 (8%)
INFECTION			SOCIAL	
CNS - (Viral)	1	a	Refused further treatment	25
Lung - (Bacterial)	13	x	Suicide	1
Lung - (Fungal)	1	b	Therapy ceased	26
Lung - (Unknown)	2		Accidental death	4
Peritonitis - (Bacterial)	9		TOTAL	56 (16%)
Peritonitis - (Fungal)	3	c e	MISCELLANEOUS	
Peritonitis - (Other)	1	d	Hepatic failure	1
Septicaemia - (Bacterial)	9		Pancreatitis	2
Septicaemia - (Fungal)	1	f	Cachexia	7
Septicaemia - (Unknown)	1		Unknown	9
Other site - (Bacterial)	7		Malignant disease	29
Other site - (Unknown)	2		Other	8
TOTAL	50 (15%)		TOTAL	56 (16%)
			TOTAL DEATHS	343 (100%)

- (a) Herpes (e) Aspergillosis
 (b) Mucormycosis (f) Cryptococcus
 (c) Candida (x) Legionella (1 patient)
 (d) Candida and Staph

TRANSPLANT DEPENDENT

There were 87 transplant patients who died during the year, mostly from cardiac causes (36 cases) or malignancy (18 cases). The death rate was 2.9% of patients at risk during the year. See Table 16.

TABLE 16

CAUSE OF DEATH - TRANSPLANT DEPENDENT: 1988

CARDIAC			VASCULAR	
Myocardial infarction	20		Pulmonary embolus	2
Pulmonary oedema	1		Cerebrovascular accident	7
Hyperkalaemia	1		Haemorrhage from elsewhere	4
Cardiac arrest	13			
Other causes of cardiac failure	1			
TOTAL	36 (41%)		TOTAL	13 (15%)
INFECTION			SOCIAL	
Lung - (Bacterial)	2		Suicide	2
Lung - (Viral)	1	a	Accidental death	1
Lung - (Protozoa)	1	b	TOTAL	3 (3%)
Septicaemia - (Bacterial)	3		MISCELLANEOUS	
Septicaemia - (Fungal)	1	c	Hepatic failure	1
Septicaemia - (Unknown)	2		Uraemia caused by graft failure	1
Other site - (Viral)	1	d	Pancreatitis	1
			Cachexia	2
			Malignant disease	18
			Other	1
			TOTAL	24 (28%)
TOTAL	11 (13%)		TOTAL DEATHS	87 (100%)

- (a) CMV (c) Candida
 (b) Pneumocystis (d) Herpes

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DIALYSIS

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33/

DIALYSIS DEPENDENT PATIENTS

METHOD AND LOCATION OF DIALYSIS 1980-1988

There were 2598 patients (157 per million population) receiving dialysis treatment at the completion of the current survey year on 31st. October, 1988; the total had increased 5% (131 patients) compared to the previous year, as shown in Table 17. Continuous peritoneal dialysis increased by 8% (60 patients), hospital based haemodialysis by 4% (32 patients), satellite based haemodialysis by 8% (31 patients) and home based haemodialysis by 2% (11 patients)

The large majority (68%) of dialysis dependent patients were not using hospital facilities for dialysis: 52% home dialysis, 16% satellite self-care haemodialysis. A slight majority of home dialysis patients (56%) was sustained by continuous ambulatory peritoneal dialysis.

TABLE 17

METHOD AND LOCATION OF DIALYSIS 1980-1988

TYPE OF DIALYSIS	1980	1981	1982	1983	1984	1985	1986	1987	1988
HAEMODIALYSIS									
HOSPITAL	560	630	622	653	696	708	739	740	772
SATELLITE	108	126	157	197	208	291	328	395	426
HOME	537	591	582	624	579	555	561	561	572
TOTAL	1205	1347	1361	1474	1483	1554	1628	1696	1770
PERITONEAL DIALYSIS									
IPD	78	89	64	49	45	37	33	41	38
CAPD	140	211	337	442	580	583	637	730	790
TOTAL	1443	1647	1762	1965	2108	2174	2298	2467	2598

1989

792

473

582

1847

37

850

2734

The age distribution showed the expected increase in the skew to the elderly age group. See Table 18. The transplant rate of the younger patients (under 50 years old) matched the increment in new patients for the year. The number of middle aged patients (50-59 years old) decreased slightly due to a significant death rate and to transition of 59 year olds into the next age bracket. The elderly patient group increased markedly, now 38.5% of dialysis patients, due mainly to "age bracket creep"; the influx of new patients slightly exceeded the egress of transplants and deaths.

Figure 18.

35/-

METHOD AND LOCATION OF DIALYSIS AUSTRALIA 1980-1988

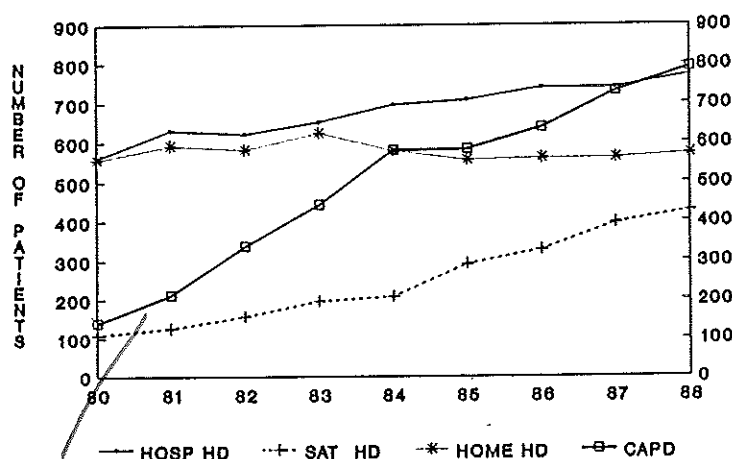


Figure 19.

DIALYSIS POPULATION PER MILLION at 31st. October, 1983-1988

1983
 97
 NSW 157
 VIC 116
 SA 142
 WA 107
 TAS 93
 NT 46

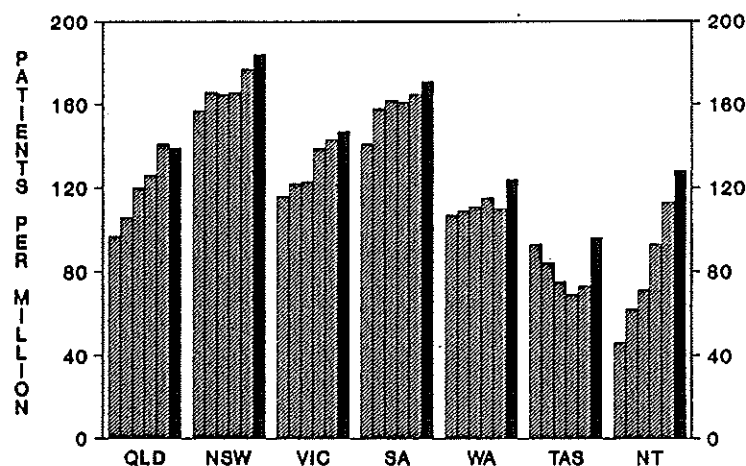


TABLE 18

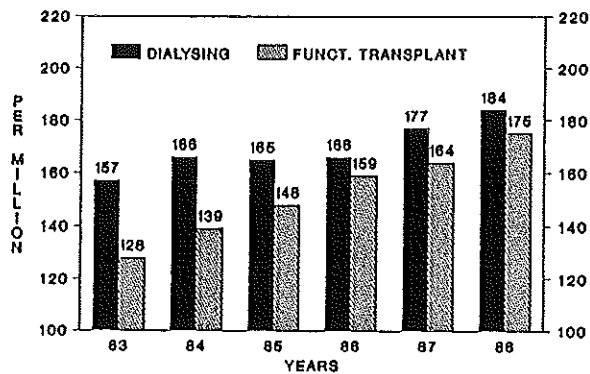
AGE DISTRIBUTION OF DIALYSIS PATIENTS - OCTOBER 1988

METHOD OF DIALYSIS	AGE									TOTAL
	0-9 YEARS	10-19 YEARS	20-29 YEARS	30-39 YEARS	40-49 YEARS	50-59 YEARS	60-69 YEARS	70-79 YEARS	80-89 YEARS	
HOSPITAL IPD	1	-	2	1	2	2	5	4	-	17
SATELLITE IPD	-	-	-	-	-	-	1	1	-	2
HOME IPD	1	6	-	1	1	5	4	1	-	19
HOSPITAL HD	2	19	57	65	122	174	247	83	3	772
SATELLITE HD	-	7	43	51	73	124	110	18	-	426
HOME HD	-	5	59	79	136	146	127	20	-	572
HOSPITAL CAPD	1	1	-	2	3	4	14	7	1	33
HOME CAPD	8	30	36	60	124	147	246	105	1	757
TOTAL PATIENTS DIALYSING	13	68	197	259	461	602	754	239	5	2598

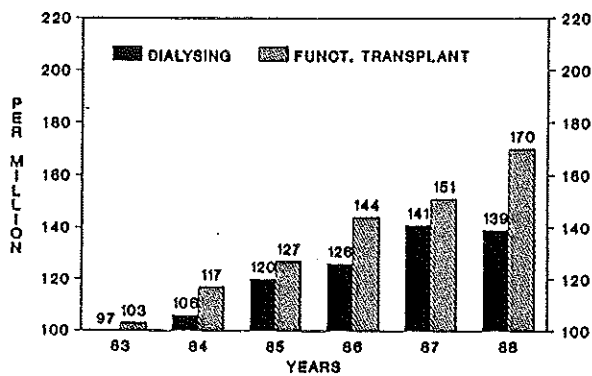
Figure 20.

COMPARISON OF DIALYSIS AND TRANSPLANT DEPENDENT PATIENTS 1983-1988

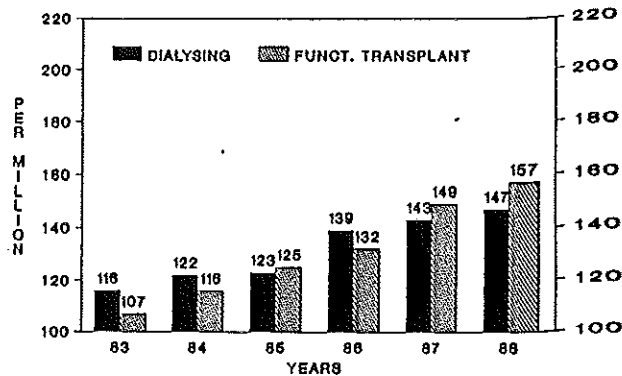
NEW SOUTH WALES



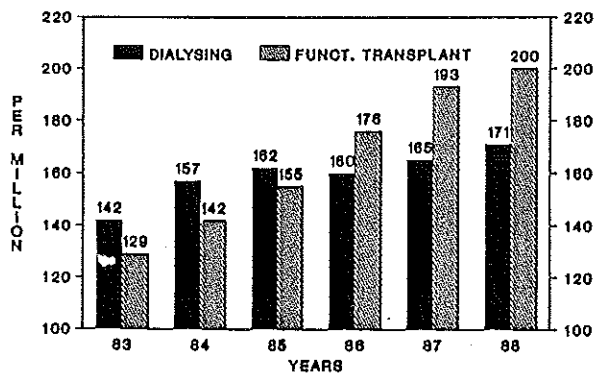
QUEENSLAND



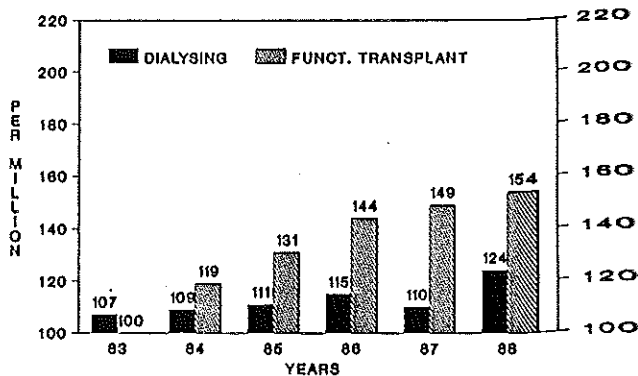
VICTORIA



SOUTH AUSTRALIA



WESTERN AUSTRALIA



Patients from Tasmania were transplanted in Victoria
and from Northern Territory in South Australia.

For calculation of population related totals the
population of these States were amalgamated.

Comparison of State distribution of dialysis and transplant patients 1983-1988

The dialysis population increased in all States except Queensland which fell slightly due to a high transplant rate, to a reduced influx of new patients and to an increased number of deaths. The population related totals ranged from New South Wales (187 per million) to Western Australia (124 per million). Only New South Wales sustained more patients by dialysis than by a functioning transplant.

Comment

A constant balance of the dynamic equilibrium of new patients, transplants and deaths, has seemed imminent in most States during the past five years. See Figure 20. Such a stable state has been transient due to rising numbers of elderly patients and relatively inadequate transplant rates.

CONTINUOUS AMBULATORY PERITONEAL DIALYSIS

Since 1978, 3537 patients had been treated by CAPD; 500 for at least two years continuously, 99 for more than four years, as shown in Table 19.

There were 790 patients (48 per million population) using CAPD at the completion of the annual survey; an 8% increase for 1987. During the year there were 450 new patients, (9% increase) and 134 deaths (34% increase). Peritonitis was not responsible for this considerable rise in mortality.

CAPD was the most common form of dialysis for the very young (<10 years old), and was used for many teenagers (10-19 years old) and elderly patients (70-85 years old).

TABLE 19

CONTINUOUS PERIOD OF C.A.P.D.

AUST

	0-6 MTHS	7-12 MTHS	13-18 MTHS	19-24 MTHS	25-30 MTHS	31-36 MTHS	37-42 MTHS	43-48 MTHS	≥ 49 MTHS
FIRST TREATMENT (3065) PTS	1262 1100	782 749	530 420	331 269	223 197	138 110	91 74	57 60	121 86
ALL TREATMENTS (3537) PTS	1578 1297	939 846	632 493	395 310	253 214	158 125	104 85	71 68	140 99

4270

Figure 21.

STOCK AND FLOW OF C.A.P.D. 1979-1988

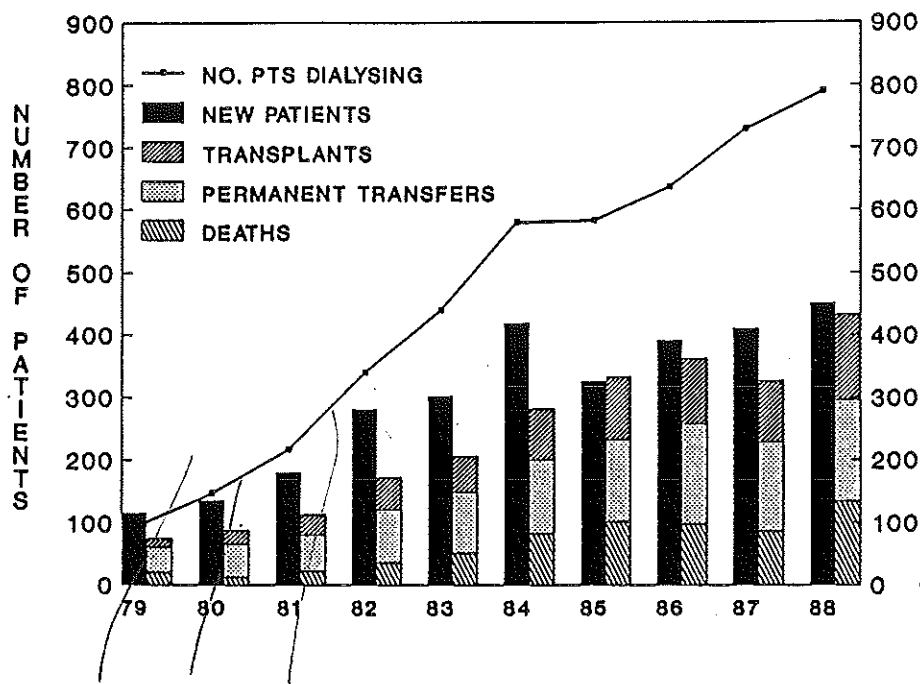


TABLE 20

STOCK AND FLOW OF C.A.P.D. 1979-1988

	1978-1979	1979-1980	1980-1981	1981-1982	1982-1983	1983-1984	1984-1985	1985-1986	1986-1987	1987-1988
NEW PATIENTS	116	135	181	281	301	418	329	391	411	450
FIRST TREATMENT PREVIOUS DIALYSIS	42	39	35	57	81	107	79	110	113	129
PREVIOUS TRANSPLANT	61	82	119	194	193	275	230	256	281	299
TRANSPLANTED	13	14	27	30	27	36	20	25	17	22
TRANSFERRED	13	22	33	51	57	81	100	104	98	136
TEMPORARILY*	3	13	16	36	26	63	84	80	50	59
PERMANENTLY	41	54	58	85	98	118	131	159	142	162
DEATHS**										
NEVER TRANSPLANTED	18	11	17	34	41	76	90	89	79	122
PREVIOUSLY TRANSPLANTED	2	1	5	2	10	6	11	9	7	12
PATIENTS DIALYSING AT 31ST. OCTOBER	92	147	216	339	440	580	583	637	730	790
PATIENTS DIALYSING AT HOME 31ST. OCTOBER	79	135	201	316	417	548	561	608	701	757
% OF ALL HOME DIALYSIS PATIENTS	13%	18%	24%	34%	39%	48%	50%	52%	55%	56%

* Returned to CAPD within twelve months.

** Death while CAPD dependent.

Time period - 1st. November to 31st. October each year.

TABLE 21

AGE OF NEW PATIENTS 1983-1988

AGE*	1983	1984	1985	1986	1987	1988	1989
0-19 YEARS	33 (11%)	40 (10%)	31 (9%)	18 (5%)	26 (6%)	26 (6%)	19 4
20-39 YEARS	55 (18%)	80 (19%)	49 (15%)	72 (18%)	68 (17%)	65 (14%)	68 15
40-59 YEARS	131 (44%)	173 (41%)	135 (41%)	146 (37%)	170 (41%)	170 (38%)	157 35
60-85 YEARS	82 (27%)	126 (30%)	114 (35%)	155 (40%)	147 (36%)	189 (42%)	206 46
TOTAL	301 (100%)	418 (100%)	329 (100%)	391 (100%)	411 (100%)	450 (100%)	1000

* Age at start of CAPD treatment.

TABLE 22

PATIENTS DIALYSING 31ST. OCTOBER 1983-1988

AGE*	1983	1984	1985	1986	1987	1988
0-19 YEARS	31 (7%)	43 (7%)	37 (6%)	29 (5%)	38 (5%)	40 (5%)
20-39 YEARS	80 (18%)	110 (19%)	97 (17%)	114 (18%)	107 (15%)	98 (12%)
40-59 YEARS	196 (45%)	235 (41%)	232 (40%)	218 (34%)	271 (37%)	278 (35%)
60-85 YEARS	133 (30%)	192 (33%)	217 (37%)	276 (43%)	314 (43%)	372 (48%)
TOTAL	440 (100%)	580 (100%)	583 (100%)	637 (100%)	730 (100%)	790 (100%)

* Age at 31st. October each year.

TABLE 23

PRIMARY RENAL DISEASE OF NEW PATIENTS 1983-1988

PRIMARY RENAL DISEASE	1983	1984	1985	1986	1987	1988
GLOMERULONEPHRITIS	99 (33%)	127 (31%)	102 (31%)	133 (34%)	125 (31%)	146 (32%)
ANALGESIC NEPHROPATHY	55 (18%)	77 (18%)	72 (22%)	58 (15%)	71 (17%)	68 (15%)
HYPERTENSION	14 (5%)	21 (5%)	12 (4%)	24 (6%)	21 (5%)	34 (8%)
POLYCYSTIC DISEASE	24 (8%)	22 (5%)	24 (7%)	31 (8%)	22 (5%)	20 (4%)
REFLUX NEPHROPATHY	22 (8%)	30 (7%)	28 (8%)	27 (7%)	33 (8%)	27 (6%)
DIABETIC NEPHROPATHY	34 (11%)	48 (12%)	32 (10%)	52 (13%)	61 (15%)	52 (12%)
MISCELLANEOUS	34 (11%)	59 (14%)	32 (10%)	34 (9%)	49 (12%)	64 (14%)
UNCERTAIN	19 (6%)	34 (8%)	27 (8%)	32 (8%)	29 (7%)	39 (9%)
TOTAL	301 (100%)	418 (100%)	329 (100%)	391 (100%)	411 (100%)	450 (100%)

HAEMODIALYSIS SURVIVAL

INITIAL PATIENT TREATMENT 1981-1984

The patient and technique survival of patients who started treatment during the period 1981-1984 is shown in Table 24 and Figure 22.

Patient Survival

Median patient survival was seven years; diabetics two years, non-diabetics seven years. Amongst the large non-diabetic group the likelihood of survival was significantly related to age at entry to treatment. For those less than 50 years old five year survival was 77% with four percent annual decline; and for those over 50 years old five year survival was 50% with ten percent annual decline.

Comment

Each year the probability of death was constant, there was no suggestion of a high early mortality rate followed by a lower rate amongst the remaining "fitter" patients. Comparison of long term survival of dialysis patients with that of transplant patients appears unfavourable but maybe misleading because of the bias arising from the requirement of the latter to be fit for operation and subsequent immunosuppression.

Technique Survival

The median period of haemodialysis without significant interruption was four years; diabetics one year, non-diabetics four years. In relation to age the technique survival was considerably lower for those over 50 years old.

Definition of dialysis patient and technique survival

Patient survival relates (as in past Reports) only to the period of specified dialysis, death subsequent to a change in treatment has not been related to C.A.P.D. or HD.

Technique survival relates to the probability of continuous specified dialysis, and death or transfer to another form of dialysis has been regarded as failure, while transplantation has been "withdrawn alive" for the purposes of actuarial survival calculation. Age was taken at first specified treatment. Diabetics were excluded, where stated, from some analyses.

Figure 22.

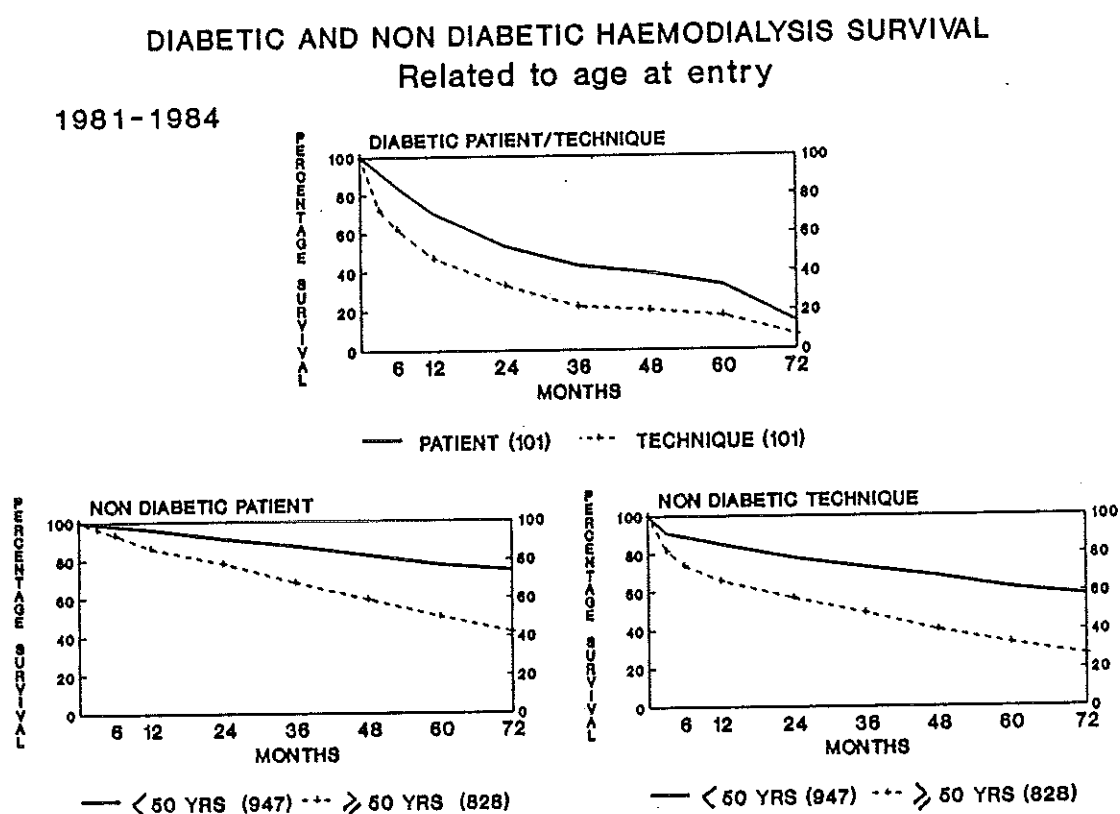


TABLE 24

DIABETIC AND NON-DIABETIC HAEMODIALYSIS SURVIVAL
RELATED TO AGE AT ENTRY 1981-1984

PATIENT SURVIVAL

AGE	3 MONTHS	6 MONTHS	1 YEAR	2 YEARS	3 YEARS	4 YEARS	5 YEARS	6 YEARS
ALL PATIENTS (n=1876)	97 ± 1 (1540)	95 ± 1 (1327)	90 ± 1 (978)	83 ± 1 (625)	75 ± 1 (436)	68 ± 2 (309)	59 ± 2 (159)	52 ± 3 (86)
DIABETIC (n= 101)	92 ± 3 (71)	84 ± 4 (56)	70 ± 6 (33)	53 ± 7 (18)	43 ± 8 (12)	39 ± 8 (8)	33 ± 9 (4)	14 ± 10 (1)
NON-DIABETIC (n=1775)	98 ± 1 (1469)	96 ± 1 (1271)	91 ± 1 (945)	85 ± 1 (607)	77 ± 1 (424)	69 ± 2 (301)	61 ± 2 (155)	54 ± 3 (85)
< 50 YEARS (n= 947)	99 ± 1 (811)	98 ± 1 (698)	96 ± 1 (492)	91 ± 1 (277)	87 ± 2 (182)	82 ± 2 (118)	77 ± 3 (58)	74 ± 4 (31)
≥ 50 YEARS (n= 828)	96 ± 1 (658)	93 ± 1 (573)	86 ± 1 (453)	78 ± 2 (330)	68 ± 2 (242)	59 ± 2 (183)	50 ± 3 (97)	42 ± 3 (54)

TECHNIQUE SURVIVAL

AGE	3 MONTHS	6 MONTHS	1 YEAR	2 YEARS	3 YEARS	4 YEARS	5 YEARS	6 YEARS
ALL PATIENTS (n=1876)	86 ± 1 (1540)	81 ± 1 (1327)	74 ± 1 (978)	66 ± 1 (625)	58 ± 1 (436)	50 ± 2 (309)	43 ± 2 (159)	37 ± 2 (86)
DIABETIC (n= 101)	72 ± 4 (71)	62 ± 5 (56)	47 ± 5 (33)	33 ± 5 (18)	22 ± 5 (12)	20 ± 5 (8)	17 ± 5 (4)	7 ± 5 (1)
NON-DIABETIC (n=1775)	87 ± 1 (1469)	82 ± 1 (1271)	75 ± 1 (945)	68 ± 1 (607)	60 ± 1 (424)	52 ± 2 (301)	44 ± 2 (155)	39 ± 2 (85)
< 50 YEARS (n= 947)	91 ± 1 (811)	89 ± 1 (698)	85 ± 1 (492)	78 ± 2 (277)	73 ± 2 (182)	68 ± 2 (118)	62 ± 3 (58)	58 ± 4 (31)
≥ 50 YEARS (n= 828)	82 ± 1 (658)	74 ± 2 (573)	66 ± 2 (453)	57 ± 2 (330)	49 ± 2 (242)	40 ± 2 (183)	33 ± 2 (97)	27 ± 2 (54)

X Survival ± S.E. numbers at risk in brackets.

INITIAL PATIENT TREATMENT 1985-1988

The patient and technique survival of those patients who started treatment during 1985-1988 is shown in Table 25 and Figure 23.

Patient Survival

2129 patients received their first haemodialysis treatment during the four year period 1985-1988. The life expectancy at one and at two years was 95% and 83% respectively; non diabetic patients 91% and 85%, diabetic nephropathy patients 78% and 60% respectively. Amongst the large group of non diabetic patients, the survival of those less than 50 years old was significantly different from that of older patients.

When compared to the survival expectancy of new patients in the period 1981-1984, there was no significant improvement in survival of the recent four year cohort 1985-1988. However the increasing age of the haemodialysis patients in this recent group was not associated with any decline in survival.

Technique Survival

Although the median survival of four years was similar to that of patients in the earlier period of 1981-1984, the early attrition was much higher especially in those over 50 years old at first treatment. This "deterioration" in technique survival reflects either failure of the form of dialysis or a change in the role of haemodialysis. While conceivable it is most unlikely that dialysis expertise has decreased over the last four years. More likely is the change in the role of haemodialysis especially for the increasing number of elderly patients.

Comment

Unfortunately due to lack of knowledge of the chosen maintenance treatment for a particular patient, perforce the analysis includes all patients who commenced haemodialysis during the period 1985-1988. Some patients were "failures" from CAPD, either temporary or permanent, while others were committed to haemodialysis. Although exclusion of peritoneal dialysis "failures" might provide a more accurate assessment of the success of haemodialysis, such an approach would exclude those who, although committed to haemodialysis, were treated initially by peritoneal dialysis. In some centres, either as policy or due to limited haemodialysis facilities, peritoneal dialysis is the first treatment for a short period.

Figure 23.

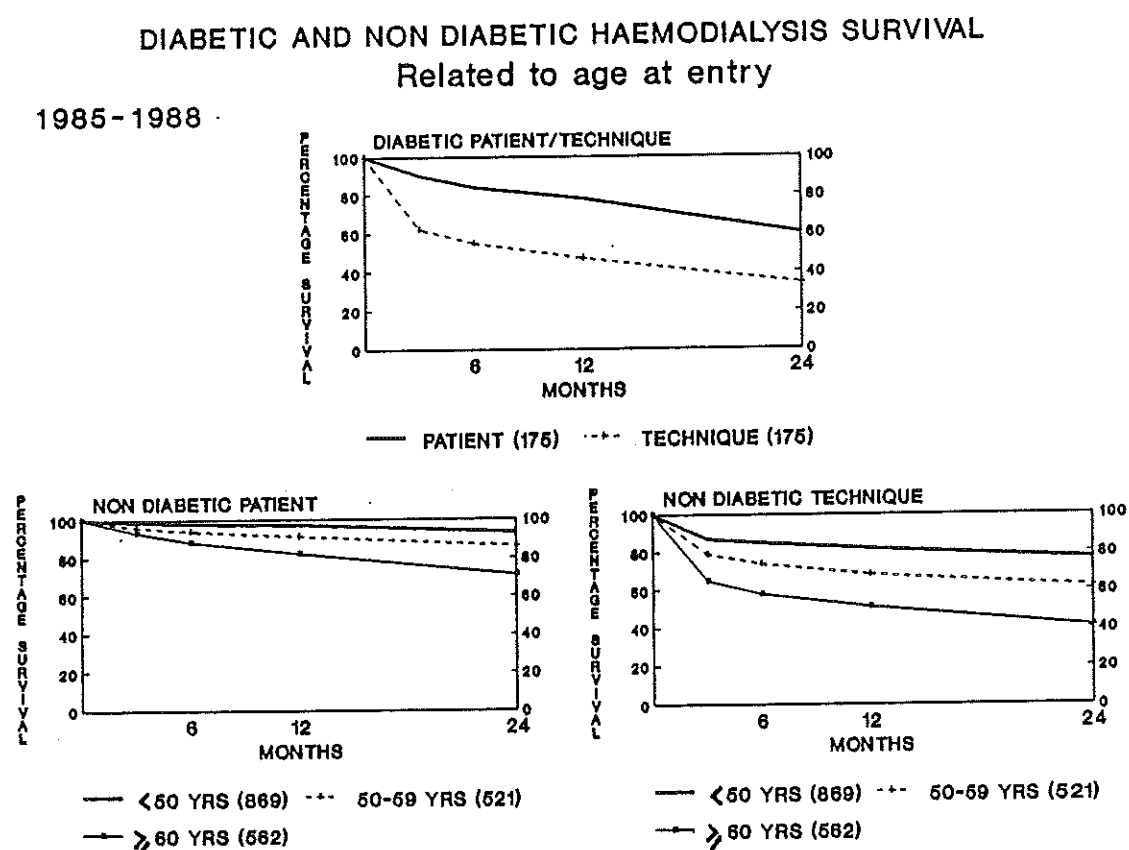


TABLE 25

DIABETIC AND NON DIABETIC HAEMODIALYSIS PATIENT AND TECHNIQUE SURVIVAL
RELATED TO AGE AT ENTRY 1985-1988

PATIENT SURVIVAL

AGE GROUP	3 MONTHS	6 MONTHS	1 YEAR	2 YEARS
ALL PATIENTS (n=2129)	96 ± 1 (1486)	94 ± 1 (1199)	90 ± 1 (765)	83 ± 1 (315)
DIABETIC (n= 175)	90 ± 3 (97)	84 ± 3 (79)	78 ± 4 (40)	60 ± 7 (14)
NON-DIABETIC (n=1954)	96 ± 1 (1389)	95 ± 1 (1120)	91 ± 1 (725)	85 ± 1 (301)
NON-DIABETIC				
0-49 YEARS (n= 869)	99 ± 1 (673)	98 ± 1 (529)	97 ± 1 (316)	93 ± 1 (108)
50-59 YEARS (n= 521)	96 ± 1 (378)	94 ± 1 (323)	90 ± 2 (220)	86 ± 2 (108)
60-85 YEARS (n= 562)	93 ± 1 (336)	88 ± 2 (267)	82 ± 2 (188)	71 ± 3 (84)

TECHNIQUE SURVIVAL

AGE GROUP	3 MONTHS	6 MONTHS	1 YEAR	2 YEARS
ALL PATIENTS (n=2129)	77 ± 1 (1486)	72 ± 1 (1199)	67 ± 1 (765)	59 ± 1 (315)
DIABETIC (n= 175)	62 ± 4 (97)	55 ± 4 (79)	47 ± 4 (40)	34 ± 5 (14)
NON-DIABETIC (n=1954)	78 ± 1 (1389)	74 ± 1 (1120)	69 ± 1 (725)	61 ± 1 (301)
NON-DIABETIC				
0-49 YEARS (n= 869)	87 ± 1 (673)	85 ± 1 (529)	82 ± 1 (316)	77 ± 2 (108)
50-59 YEARS (n= 521)	79 ± 2 (378)	74 ± 2 (323)	68 ± 2 (220)	62 ± 2 (108)
60-85 YEARS (n= 562)	65 ± 2 (336)	58 ± 2 (267)	51 ± 2 (188)	41 ± 2 (84)

% Survival ± S.E: numbers at risk in brackets.

Comment (Continued)

On the converse, use of haemodialysis as initial treatment for patients committed to peritoneal dialysis may be widespread. Such an approach suggests urgent institution of dialysis because of acute deterioration in renal failure or a delay in commencing dialysis until the severity of symptoms warrants haemodialysis rather than peritoneal dialysis. An alternative explanation may be that certain units prefer a period of haemodialysis before peritoneal dialysis, for elusive reasons. Lastly it may reflect indecision on the part of patient, doctor or both about the preferred method of dialysis; while optimally such decisions should be made some months before uraemia warrants any form of dialysis, late referral, or late discussion may preclude such an orderly course of management.

CAUSES OF TECHNIQUE FAILURE

Failure of technique consists of death or transfer to peritoneal dialysis; in the first year most "losses" were transfers to peritoneal dialysis (78%), but during the second and third years most losses were increasingly due to death; 73% and 85% in second and third years. See Table 26.

More detailed assessment of the first year showed that the proportion of "failures" due to deaths increased rapidly during the year: 16% zero to three months, 38% three to six months, 50% six to twelve months. During the first year 480 patients transferred to peritoneal dialysis, 392 (82%) in the first three months; 255 (53%) in the first month alone. 61% of the transfers in the first three months were to CAPD: 211 of 392 transfers. See Table 27.

TABLE 26

REASONS FOR WITHDRAWAL FROM INITIAL HAEMODIALYSIS 1985-1988NON DIABETIC PATIENTS

0 - 49 YEARS (866)

PERIOD OF HAEMODIALYSIS	TRANSPLANT	PERITONEAL DIALYSIS	DEATH
0 - 3 MONTHS	29	98	9
4 - 6 MONTHS	74	12	3
7 - 12 MONTHS	132	7	7
13 - 24 MONTHS	106	6	8
25 - 36 MONTHS	29	1	3
37 - 48 MONTHS	2	-	3

50 - 85 YEARS (1083)

PERIOD OF HAEMODIALYSIS	TRANSPLANT	PERITONEAL DIALYSIS	DEATH
0 - 3 MONTHS	13	246	52
4 - 6 MONTHS	25	34	22
7 - 12 MONTHS	50	25	26
13 - 24 MONTHS	41	16	29
25 - 36 MONTHS	15	2	14
37 - 48 MONTHS	3	-	2

DIABETIC PATIENTS

ALL PATIENTS (175)

PERIOD OF HAEMODIALYSIS	TRANSPLANT	PERITONEAL DIALYSIS	DEATH
0 - 3 MONTHS	2	49	15
4 - 6 MONTHS	2	4	6
7 - 12 MONTHS	12	5	4
13 - 24 MONTHS	3	2	7
25 - 36 MONTHS	3	-	1
37 - 48 MONTHS	-	-	2

TABLE 27

PERITONEAL DIALYSIS AFTER INITIAL HAEMODIALYSIS TREATMENT 1985-1988

(a) NO PREVIOUS PERITONEAL DIALYSIS

PERIOD OF HAEMODIALYSIS	NON DIABETICS		DIABETICS		TOTAL
	IPD	CAPD	IPD	CAPD	
0 - 1 MONTH	72	87	15	13	187
1 - 2 MONTHS	24	22	3	-	49
2 - 3 MONTHS	14	7	1	-	22
TOTAL	110	116	19	13	258

(b) PREVIOUS PERITONEAL DIALYSIS

PERIOD OF HAEMODIALYSIS	NON DIABETICS		DIABETICS		TOTAL
	IPD	CAPD	IPD	CAPD	
0 - 1 MONTH	25	37	3	3	68
1 - 2 MONTHS	12	26	4	1	43
2 - 3 MONTHS	5	12	3	3	23
TOTAL	42	75	10	7	134

CONTINUOUS AMBULATORY PERITONEAL DIALYSIS

INITIAL PATIENT TREATMENT 1985-1988

The patient and technique survival of those patients who started treatment during 1985-1988 is shown in Table 28 and Figure 24.

Patient Survival

1524 patients commenced peritoneal dialysis during the period 1985-1988; the probability of survival was 88% and 78% at one and two years respectively. There was no significant difference in survival of those with diabetic nephropathy. Age exerted a significant effect which increased with the period of dialysis.

Technique Survival

The likelihood of continuous peritoneal dialysis of patients commencing treatment during this period was 65% at one year and 47% at two years. Diabetic nephropathy did not confer any adverse effect. Increasing age was associated with a significant reduction in technique survival.

Transfer to haemodialysis for any length of time, no matter how short, has been regarded as failure of peritoneal dialysis technique. Nevertheless when a period of less than one month of haemodialysis was regarded as no interruption to commitment to continuous dialysis, the technique survival was not altered.

The technique survival at twelve months of patients receiving their initial treatment in each year from 1985-1987 had increased again from 58% to 64%.

Figure 24.

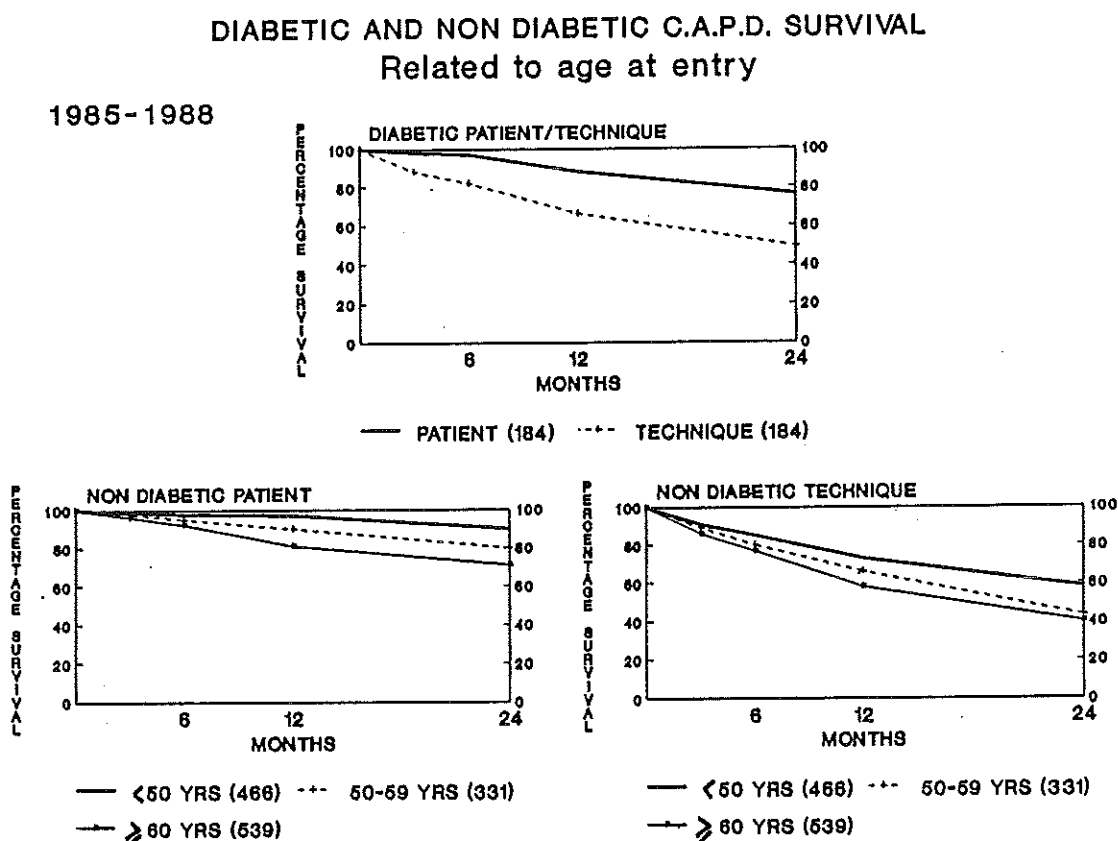


TABLE 28

DIABETIC AND NON DIABETIC C.A.P.D. PATIENT AND TECHNIQUE SURVIVAL
RELATED TO AGE AT ENTRY 1985-1988

PATIENT SURVIVAL

AGE GROUP	3 MONTHS	6 MONTHS	1 YEAR	2 YEARS
ALL PATIENTS (n=1524)	98 ± 1 (1205)	95 ± 1 (951)	88 ± 1 (534)	79 ± 2 (184)
DIABETIC (n= 184)	98 ± 1 (146)	97 ± 1 (124)	88 ± 3 (70)	76 ± 5 (26)
NON-DIABETIC (n=1340)	98 ± 1 (1059)	95 ± 1 (827)	88 ± 1 (464)	79 ± 2 (158)
NON-DIABETIC				
0-49 YEARS (n= 466)	99 ± 1 (366)	98 ± 1 (282)	97 ± 1 (143)	90 ± 3 (47)
50-59 YEARS (n= 331)	98 ± 1 (266)	95 ± 1 (208)	90 ± 2 (118)	80 ± 4 (34)
60-85 YEARS (n= 539)	96 ± 1 (425)	92 ± 1 (335)	81 ± 2 (202)	71 ± 3 (76)

TECHNIQUE SURVIVAL

AGE GROUP	3 MONTHS	6 MONTHS	1 YEAR	2 YEARS
ALL PATIENTS (n=1524)	88 ± 1 (1205)	81 ± 1 (951)	65 ± 1 (534)	47 ± 2 (184)
DIABETIC (n= 184)	88 ± 2 (146)	82 ± 3 (124)	66 ± 4 (70)	49 ± 5 (26)
NON-DIABETIC (n=1340)	88 ± 1 (1059)	80 ± 1 (827)	65 ± 2 (464)	46 ± 2 (158)
NON-DIABETIC				
0-49 YEARS (n= 466)	91 ± 1 (366)	85 ± 2 (282)	73 ± 3 (143)	58 ± 3 (47)
50-59 YEARS (n= 331)	89 ± 2 (266)	80 ± 2 (208)	66 ± 3 (118)	43 ± 4 (34)
60-85 YEARS (n= 539)	86 ± 2 (425)	77 ± 2 (335)	58 ± 2 (202)	40 ± 3 (76)

± Survival ± S.E. numbers at risk in brackets.

Cause of Treatment Failure

Failure to complete twelve months of continuous peritoneal dialysis, excluding transplantation, was usually due to transfer to haemodialysis. Death in the first twelve months was nearly five times more likely to occur in the older patients.

During the first year 311 patients transferred to haemodialysis, 44% in the first three months. As a cause of technique failure, the proportion due to death increased from 28% in the first year to 46% in the third year; increasing patient age, not unexpectedly, was associated with a greater proportion of deaths. See Table 29.

TABLE 29

REASONS FOR WITHDRAWAL FROM INITIAL C.A.P.D. TREATMENT 1985-1988

NON DIABETIC PATIENTS

0 - 49 YEARS (466)

PERIOD OF CAPD	TRANSPLANT	HAEMODIALYSIS	DEATH
<u>MONTHS</u>			
0 - 3	19	35	5
4 - 6	35	19	2
7 - 12	55	31	3
13 - 24	34	14	7
25 - 36	6	10	1
37 - 48	1	2	-

50 - 85 YEARS (874)

PERIOD OF CAPD	TRANSPLANT	HAEMODIALYSIS	DEATH
<u>MONTHS</u>			
0 - 3	8	83	25
4 - 6	22	63	25
7 - 12	31	62	44
13 - 24	24	57	26
25 - 36	4	9	17
37 - 48	-	4	2

DIABETIC PATIENTS

ALL PATIENTS (184)

PERIOD OF CAPD	TRANSPLANT	HAEMODIALYSIS	DEATH
<u>MONTHS</u>			
0 - 3	4	18	3
4 - 6	4	-	1
7 - 12	12	12	10
13 - 24	10	7	7
25 - 36	1	7	4
37 - 48	-	1	-

198
512
50

TRANSPLANTATION

TRANSPLANTATIONCONTENTSPage

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TRANSPLANTATIONTransplant operations 1963-1988

There were 6599 operations performed on 5535 patients since 1963 resulting in 2801 functioning grafts (169 per million) by the completion of the latest survey on 31st. October 1988. See Table 30. The annual transplantation rate increased from 242 (1973) to 448 (1988), as graft survival (twelve months) rose from 45% to 83%. See Figures 25 and 26.

TABLE 30

SUMMARY RENAL TRANSPLANTATION 1963-1988*

	AUSTRALIA
PATIENTS TRANSPLANTED	5535 5943
GRAFTS PERFORMED	6553 6599-7069
a) CADAVER DONOR	6122
b) LIVING DONOR	477 516
GRAFTS FUNCTIONING*	2801 3052
a) PRIMARY	2378 2606
b) SECOND	369 389
c) THIRD	47 51
d) FOURTH	6 5
e) FIFTH	1

* As at 31st. October, 1988.9

Transplant operations: 1988

448 transplant operations were performed during the past year ending 31st. October, 1988, of which 90% were from cadaver donors; 83% were first grafts, 14% second grafts and one was the first Australian fifth graft, as shown in Table 31. The recipients were mostly 30-59 years old (67%), but an increasing number were in the older age group (>60 years): 42 patients (1988), 31 patients (1985). See section on Australia in the Appendix.

TABLE 31

NUMBER OF RENAL TRANSPLANT OPERATIONS

12 MONTHS TO OCT 31	AUSTRALIA					
	1st	2nd	3rd	4th	5th	TOTAL
1978	261	41	2	-	-	304 (17)*
1979	279	35	2	-	-	316 (34)
1980	306	66	10	-	-	382 (32)
1981	295	54	10	1	-	360 (36)
1982	336	72	7	-	-	415 (52)
1983	287	66	9	2	-	364 (50)
1984	341	68	10	1	-	420 (46)
1985	320	77	14	1	-	412 (34)
1986	351	66	10	1	-	428 (33)
1987	329	57	17	4	-	407 (40)
1988	370	62	13	2	1	448 (47)

1989

408

52

10

-

-

470

(39)

() * Living donors.

Figure 25.

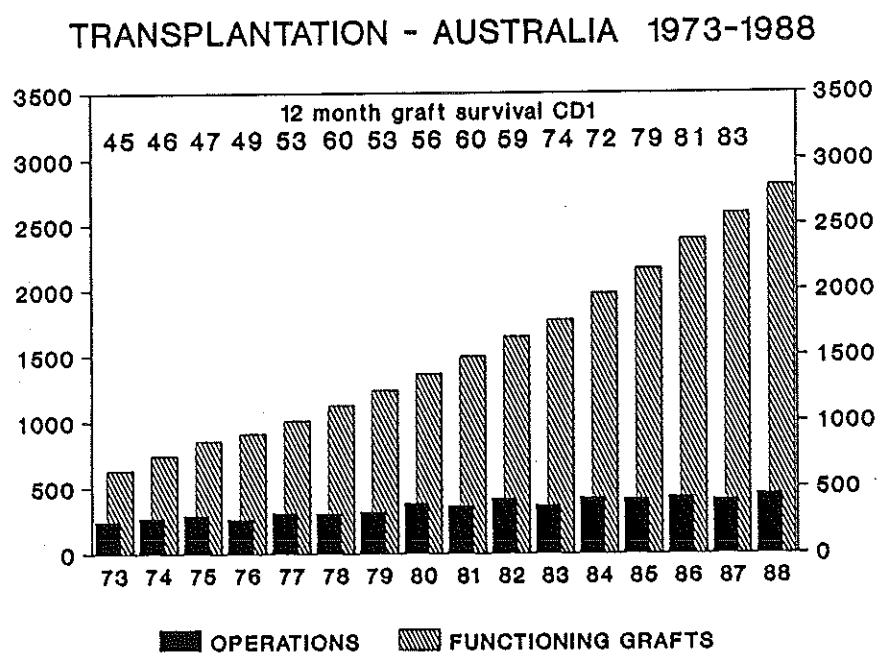
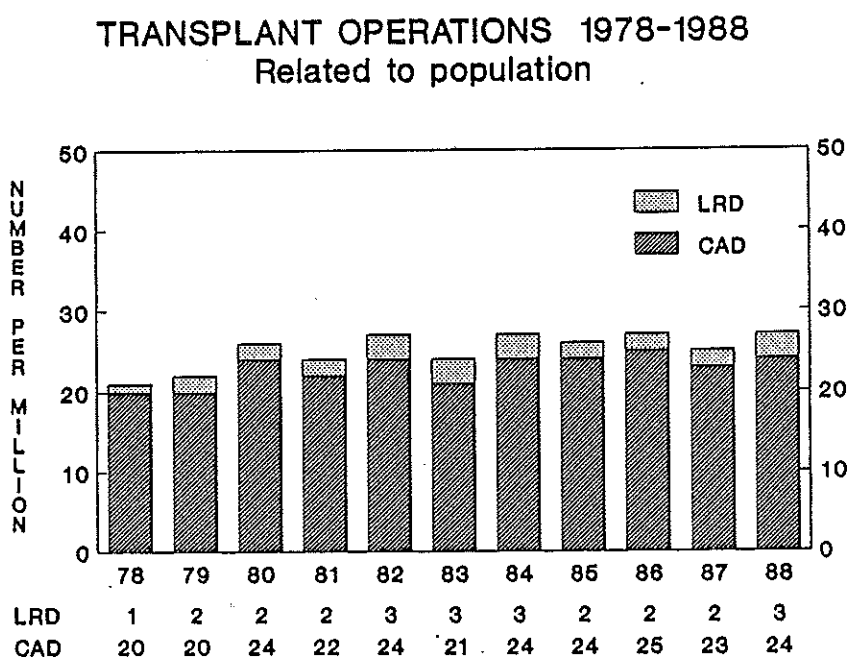


Figure 26.

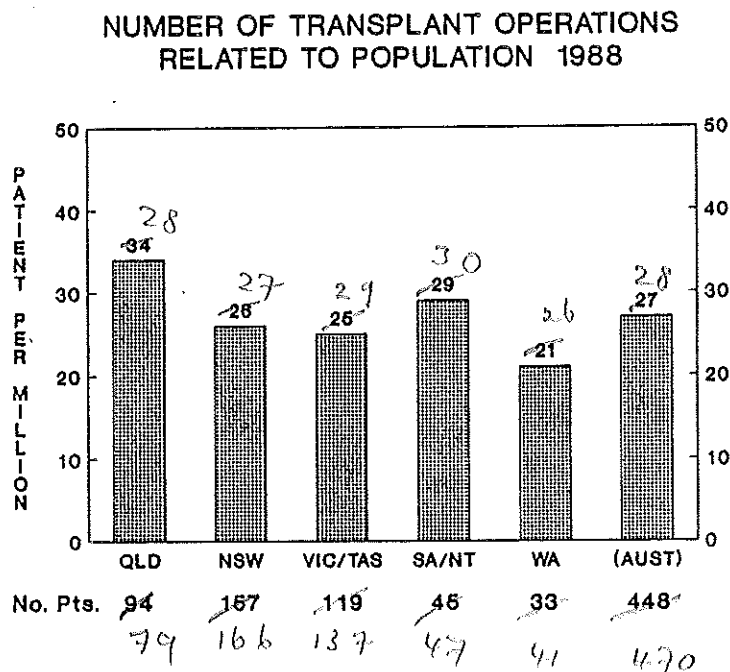


TATE DISTRIBUTION OF TRANSPLANT OPERATIONS

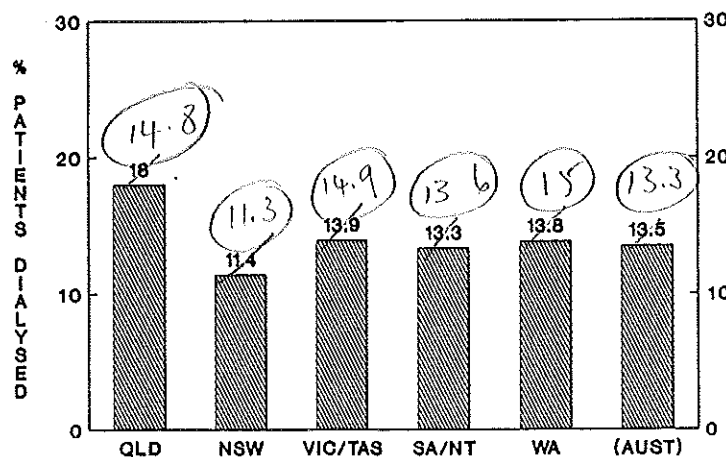
The number of operations, related to population, performed in each state ranged from Queensland 34 per million to Western Australia 21 per million. See Figure 27. Because all Tasmanian patients have been transplanted in Victoria and Northern Territory patients in South Australia, the population of those two smaller States has been included when calculating the Victorian and South Australian transplant rates. The number of operations increased by 50% in New South Wales and 34% in Queensland compared to 1987; the number fell slightly in the three remaining States.

In relation to the number of patients dialysed, the operations performed ranged from 11.4% in New South Wales to 18% in Queensland. These figures relate to all patients dialysed during the year, not just those awaiting a transplant. See Figure 27.

Figure 27.



AS PROPORTION OF PATIENTS DIALYSED 1988



TX rate

CADAVER DONOR KIDNEY PROCUREMENT

Table 32 shows the yearly totals (1984-1988) by State in absolute numbers and on a per million of population basis. Although the 1988 total was a record in absolute terms, it represents only a minor increase in population adjusted terms and lags by at least ten per million behind the best efforts of the European countries. It is again notable how the State totals vary from year to year. The donor numbers for the first four months of 1989 are increased by 13% compared to last year.

Figure 28 shows 1987 and 1988 procurement rate graphed on a State basis emphasising the increase seen in all States other than Western Australia. Although there may be a slight overall drift towards increased numbers of donors there seems little doubt that a quantum jump is needed for Australia to match the performance of our European colleagues.

Figure 28.

CADAVER KIDNEYS PROCURED IN AUSTRALIA
Per million of population

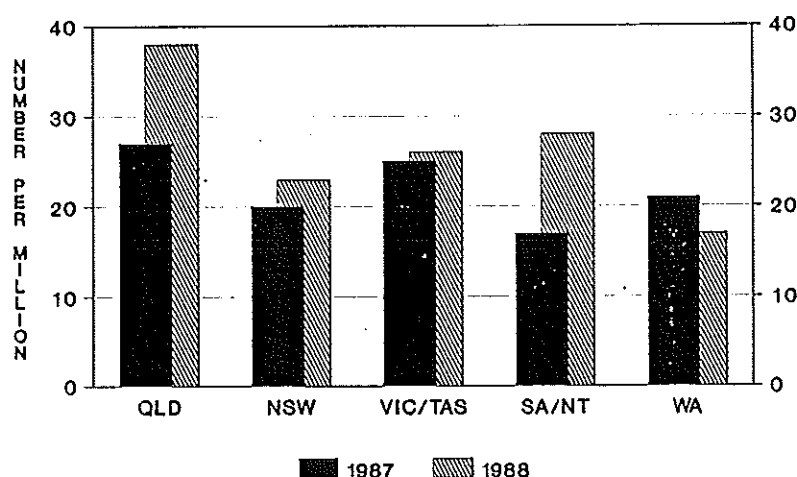


TABLE 32

CADAVER DONOR KIDNEY PROCUREMENT 1984-1988

STATE	1984	1985	1986	1987	1988
QUEENSLAND	62 (25)	87 (35)	87 (34)	71 (27)	104 (38)
NEW SOUTH WALES	120 (21)	126 (22)	112 (19)	116 (20)	137 (23)
VICTORIA	108 (27)	92 (23)	88 (21)	107 (25)	111 (26)
SOUTH AUSTRALIA AND NORTHERN TERRITORY	41 (28)	26 (17)	64 (42)	25 (17)	44 (28)
WESTERN AUSTRALIA	37 (27)	31 (22)	37 (26)	32 (21)	26 (17)
TASMANIA *	6 (14)	16 (37)	6 (13)	-	-
AUSTRALIA	374 (24)	378 (24)	394 (25)	351 (22)	422 (26)

Totals are kidneys procured and actually used somewhere

() No. per million of population (South Australia includes Northern Territory)

* Tasmanian donor kidneys incorporated in Victorian total from 1.1.87

LIVING RELATED DONORS

The number and source of kidneys from living donors used for transplantation between 1978 and 1989 is shown in Table 33 and Figure 29.

Comment

The increasing number of such operations over the past three years may reflect the prolonged period of dialysis before a cadaver kidney is available. Any misgivings about using a living rather than cadaver donor graft may be overcome when the social disruption, or decreased well being of prolonged dialysis are compared to life with a functioning transplant. The median waiting period for transplantation is one to two years and longer for sensitised recipients.

TABLE 33

SOURCE OF LIVING DONOR KIDNEY 1978-1988

SOURCE	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	TOTAL
MOTHER	6	6	5	9	14	15	21	17	6	9	15	123
FATHER	5	11	8	5	4	3	7	3	5	11	8	70
BROTHER	2	5*	13*	9	16 ⁺	15 ⁺	5	6 ⁺	9 ⁺	7	7	97
SISTER	4	9	6	13*	16 ⁺	12*	12	6	9	10	8 ⁺	105
OFFSPRING	1	1	-	-	2	5	1	2	3	2	5	20
OTHER	1	1	-	-	-	-	-	-	1	1	4	9
TOTAL	17	34	32	36	52	50	46	34	33	40	47	421

* Twin (identical)

+ Twin (non-identical)

UNRELATED LIVING DONORS

There were five reported cases of unrelated living donors, all during the two year period 1986-1988. Details of age, sex, HLA typing, recipient sensitisation and the "relationship" of donor to recipient is shown in Table 34. A further case involved a cousin with one haplotype identity which has been regarded as a "related" kidney donor.

The experience is too small to analyse for any trends. Information regarding the use of donor specific transfusion has not been sought.

Figure 29.

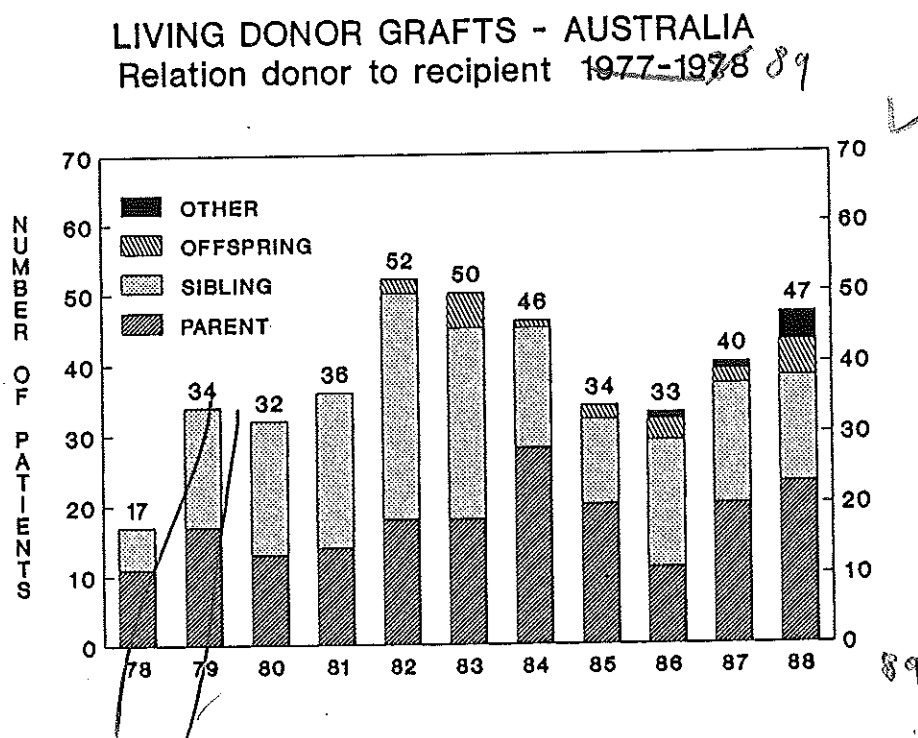


TABLE 34

LIVING UNRELATED DONORS 1972-1988

FUNCTIONING TRANSPLANT									
TX DATE	TX		AGE	SEX	HLA TYPING			ANTIBODY	
					A	B	DR	PEAK	TX
10.9.86	1	RECIPIENT	17	F	2, 3	14,35	1, 4	80	80
		DONOR/ EMOTIONAL	39	F	2,28	35,60	13		
2.12.87	3	RECIPIENT	38	M	2,30	5,45	2,11	90	60
		DONOR/WIFE	40	F	26,31	18,38	1, 2		
10.3.88	2	RECIPIENT	35	M	2,11	60,62	2,13		
		DONOR/WIFE	38	F	2,11	35,62	4	10	0
FAILED TRANSPLANT									
23.1.87	1	RECIPIENT	46	M	1,24	27,63	4,10	0	0
		DONOR/WIFE	47	F	11,24	27,35	4		
20.4.88	1	RECIPIENT	55	M	2,25	8,44	2, 3	0	0
		DONOR/ UNRELATED	67	M	3,29	7,44	2, 7		

USE OF ANTI T CELL ANTIBODIES - ATG/OKT3. 1981-1988.

The number of patients reported to have received OKT3 or various types of ATG is shown in Table 35 and Figure 30. Prophylactic use during the early week(s) after transplantation reached a peak in 1982 and gradually declined until 1987. ALG/ATG were the most common agents, but for the first time the use of OKT3 was reported in 1988.

For rejection ATG was used for an increasing number of patients from 1982 to 1984, but then declined. Some concern about the use of ATG with Cyclosporin A may have contributed to the reduction in use after 1984. OKT3 rapidly replaced ATG in 1987-88.

The proportion of first and second grafts which were treated for rejection with ATG or OKT3 is shown in Table 35. Apart from 1986, a steady increase occurred from 1981 (2%) to 1988 (26%) in use for first grafts.

There was a greater extent and rate of increase in use for second grafts, particularly 1987 (30%) and 1988 (40%). The contribution of these trends to the success of transplantation over the past few years cannot be ascertained from data available to the Registry.

Comment

Some data which showed improving graft survival in Azathioprine treated cases in 1983-1986 may have reflected the benefits of increasing use of ATG. The relative contribution to the increasing success of Cyclosporin A treated patients is undetermined.

RECURRENCE OF DISEASE

The prevalence of recorded recurrence of glomerulonephritis in transplanted kidneys from 1963 to 1988 is shown in Table 36. Quite obviously this data is incomplete. The Registry has sought, since 1977, such information regarding recurrence causing loss of graft but only broadened its ambition in 1988 to include any biopsy proven recurrence regardless of effect on graft function. As with previous changes in the nature of data requested by the Registry, no retrospective information was required but it is hoped that all reasonable efforts will be made to do so in view of the importance of the information. Changes in any treatment may unexpectedly influence the extent of such recurrence in certain forms of glomerulonephritis.

The documentation of recurrence will require histological evidence of the recipient's primary renal disease. Where appropriate, such material should be sought in cases likely to receive a renal transplant.

Figure 30.

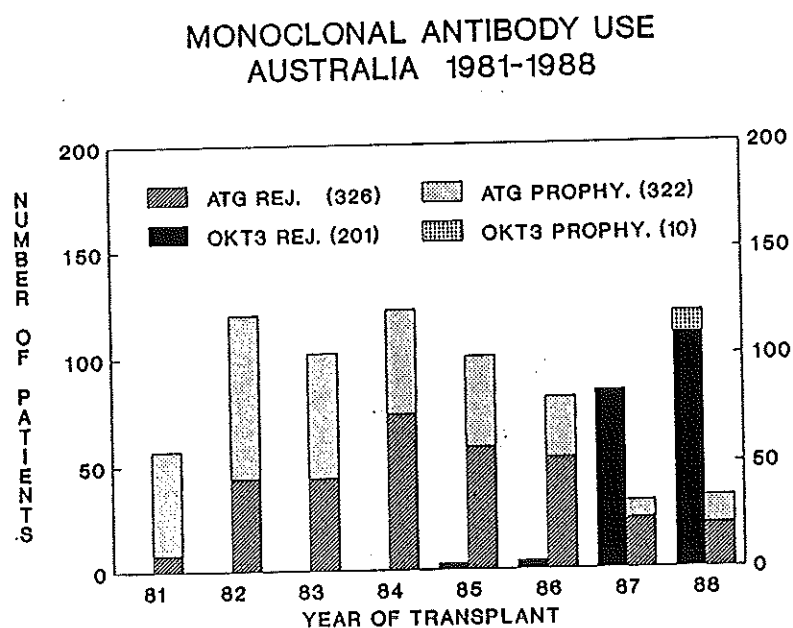


TABLE 35

MONOCLONAL ANTIBODIES FOR REJECTION 1981-1988

FIRST GRAFT				SECOND GRAFT			
YEAR OF TRANSPLANT	ATG	OKT3	TOTAL		ATG	OKT3	TOTAL
1981 (n=295)	2%	-	2%	(n=54)	2%	-	2%
1982 (n=336)	9%	-	9%	(n=72)	11%	-	11%
1983 (n=287)	10%	-	10%	(n=66)	15%	-	15%
1984 (n=341)	15%	-	15%	(n=68)	29%	-	29%
1985 (n=320)	15%	-	15%	(n=77)	8%	3%	11%
1986 (n=351)	11%	1%	12%	(n=66)	15%	2%	17%
1987 (n=329)	6%	18%	24%	(n=57)	4%	26%	30%
1988 (n=370)	4%	22%	26%	(n=62)	6%	34%	40%

TABLE 36

RECURRENCE OF PRIMARY RENAL DISEASE 1963-1988

TYPE OF DISEASE	NUMBER PATIENTS	MULTIPLE RECURRENCE	NUMBER TX FUNCTIONING
GLOMERULONEPHRITIS			
FOCAL SCLEROSING	16	4	4
MCGN TYPE 1	8		2
MCGN TYPE 11	10	1	3
RAPIDLY PROGRESSIVE	3		1
MES. PROLIF. (IGA+)	5		1
MES. PROLIF. (IGA-)	1		1
GOODPASTURE'S SYND.	3		1
HENOCH-SCHONLEIN	1		
HAEMOLYTIC URAEMIC SYND.	2	1	
OXALOSIS	5		1
DIABETES	1		
AMYLOID	1		

Living donors: Father 3 Mother 5 (1)* Sister 1
 Brother (1)* Identical twin (1)*

* Graft still functioning

TRANSPLANTATION SURVIVAL

PATIENTS TRANSPLANTED 1985-1988

The patient and graft survivals following living or cadaver donor graft operations during the period 1985-1988 are shown in Table 37 and Figures 31 and 32. Comparative results for 1980-1984 are also shown Figures 31 and 32.

Patient survival

Living donor graft operations were followed by one year patient survival probability of 95% and 100% for first and second grafts respectively.

Cadaver donor graft operations had a one year patient survival probability of 92%, 97% and 89% for first, second and third grafts.

Comment

The superior survival following second grafts may be due to the lower proportion of elderly patients compared to first graft recipients. Comparison with the cohort of patients transplanted in 1980-1984 showed negligible difference except for the survival of second cadaver graft recipients which had increased from 90% to 97%.

Graft survival

Living donor graft survival at one year was 90% and 85% for first and second grafts respectively.

Cadaver donor graft survival at one year was 82%, 75%, 59% for first, second and third grafts. The success of retransplantation, even that of third grafts, was most encouraging. Comparison with 1980-1984 showed an enormous improvement of 20-25% in one year survival.

TABLE 37

PATIENT AND GRAFT SURVIVAL AFTER FIRST, SECOND AND THIRD GRAFT 1985-1988

PATIENT SURVIVAL

	3 MONTHS	6 MONTHS	1 YEAR	2 YEARS
<u>LIVING DONOR</u>				
PRIMARY GRAFT (n= 127)	98 $\pm$ 1 (112)	98 $\pm$ 1 (101)	95 $\pm$ 2 (82)	94 $\pm$ 3 (43)
SECOND GRAFT (n= 14)	100 $\pm$ 0 (13)	100 $\pm$ 0 (11)	100 $\pm$ 0 (8)	100 $\pm$ 0 (7)
<u>CADAVER DONOR</u>				
PRIMARY GRAFT (n=1193)	95 $\pm$ 1 (1066)	94 $\pm$ 1 (950)	92 $\pm$ 1 (791)	90 $\pm$ 1 (519)
SECOND GRAFT (n= 236)	98 $\pm$ 1 (221)	98 $\pm$ 1 (201)	97 $\pm$ 1 (172)	95 $\pm$ 2 (116)
THIRD GRAFT (n= 48)	94 $\pm$ 4 (43)	89 $\pm$ 5 (37)	89 $\pm$ 5 (33)	89 $\pm$ 5 (16)

GRAFT SURVIVAL

	3 MONTHS	6 MONTHS	1 YEAR	2 YEARS
<u>LIVING DONOR</u>				
PRIMARY GRAFT (n=127)	94 $\pm$ 2 (109)	93 $\pm$ 2 (97)	90 $\pm$ 3 (80)	83 $\pm$ 4 (41)
SECOND GRAFT (n= 14)	85 $\pm$ 10 (11)	85 $\pm$ 10 (10)	85 $\pm$ 10 (8)	85 $\pm$ 10 (7)
<u>CADAVER DONOR</u>				
PRIMARY GRAFT (n=1193)	86 $\pm$ 1 (964)	84 $\pm$ 1 (851)	82 $\pm$ 1 (694)	78 $\pm$ 1 (440)
SECOND GRAFT (n= 236)	79 $\pm$ 3 (181)	78 $\pm$ 3 (161)	75 $\pm$ 3 (135)	71 $\pm$ 3 (91)
THIRD GRAFT (n= 48)	70 $\pm$ 7 (32)	63 $\pm$ 7 (27)	59 $\pm$ 7 (23)	48 $\pm$ 8 (9)

% Survival $\pm$ S.E: numbers at risk in brackets.

Figure 31.

PATIENT SURVIVAL

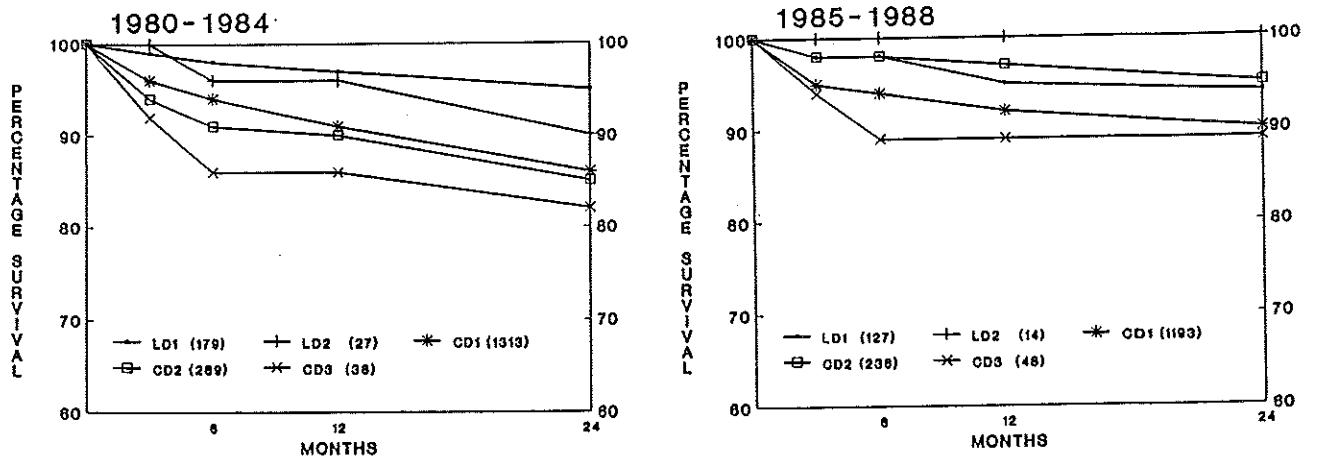
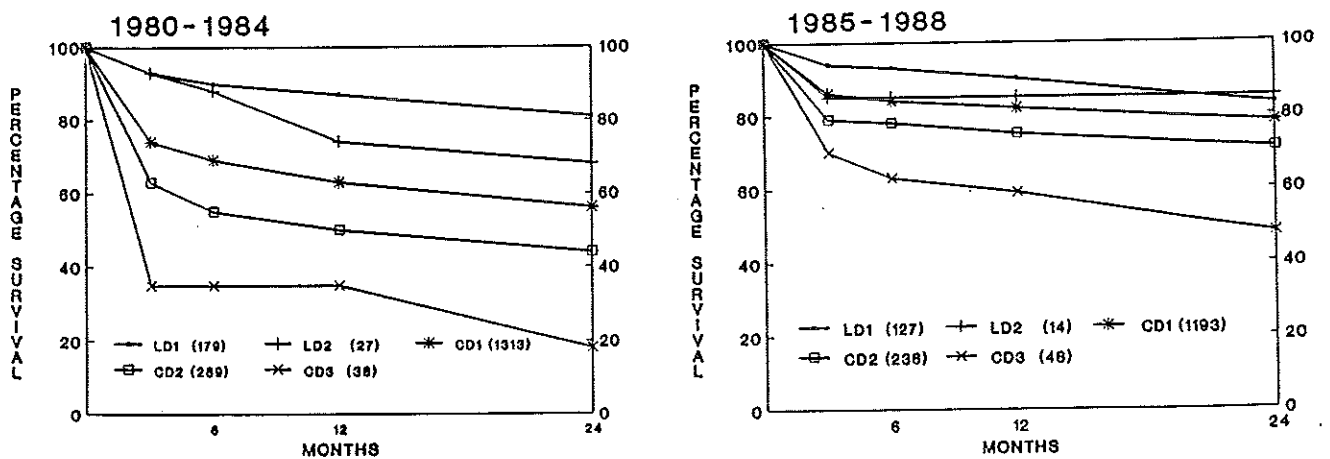


Figure 32.

GRAFT SURVIVAL



RISK FACTORS FOR GRAFT SURVIVAL

TRANSPLANTATION SURVIVAL RELATED TO AGE

Age of recipient

The age of the recipients significantly influenced their survival, especially those over sixty years old at transplantation. Following the initial mortality of the first twelve months, subsequent survival was barely influenced by age.

Graft survival was not significantly influenced by the recipient's age, except for the elderly patients for whom graft and patient survival were closely related. Survival during the second year was not influenced by age. See Tables 38, 39 and Figure 33.

Age of donor (recipients aged 20-59 years)

During the period 1983-1988, 986 Cyclosporin A treated recipients (20-59 years old) received 84% of kidneys from young donors (10-49 years) and 4% from elderly donors. 438 recipients who did not receive Cyclosporin A as initial treatment received 87% kidneys from young donors and 2% from elderly donors. See Tables 40 and 41.

The patient and graft survival of 20-59 year old recipients of primary cadaver grafts transplanted during 1983-1988 was related to donor age and the use of Cyclosporin A for initial maintenance immunosuppression. See Table 40 and Figure 34.

Previous analysis had shown similar results for graft survival from donors aged 10-19, 20-29, 30-39 and 40-49 years.

Cyclosporin A treated recipients showed a distinct decline in patient and graft survival following transplantation of a kidney from an elderly donor. A lesser and non significant decline was observed with middle aged donors.

Azathioprine and Prednisolone treated recipients (no Cyclosporin A) also showed a distinct decline in graft survival, not patient survival, following transplantation from an elderly donor. See Table 41.

Comment

The potential hazard arising from use of Cyclosporin A with elderly donor kidneys appears to have been no greater than using Azathioprine. Comparison with younger donor kidneys within each drug treatment group showed the same disadvantage associated with elderly donor kidneys.

Figure 33.

PRIMARY CADAVER PATIENT AND GRAFT SURVIVAL
Related to recipient age 1985-1988

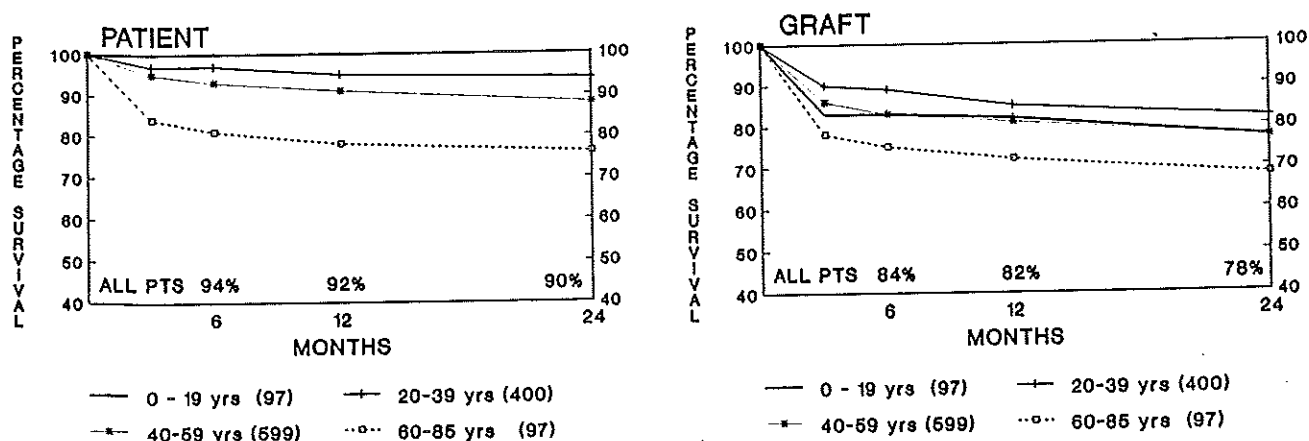


TABLE 38

PRIMARY CADAVER PAEDIATRIC PATIENT AND GRAFT SURVIVAL 1985-1988
RELATED TO AGE

PATIENT SURVIVAL

AGE GROUP	3 MONTHS	6 MONTHS	1 YEAR	2 YEARS	3 YEARS
ALL PATIENTS (n=44)	100 ± 0 (42)	100 ± 0 (41)	100 ± 0 (34)	100 ± 0 (24)	100 ± 0 (9)
0-9 YEARS (n=19)	100 ± 0 (17)	100 ± 0 (16)	100 ± 0 (12)	100 ± 0 (7)	100 ± 0 (5)
10-14 YEARS (n=25)	100 ± 0 (25)	100 ± 0 (25)	100 ± 0 (22)	100 ± 0 (17)	100 ± 0 (4)

GRAFT SURVIVAL

AGE GROUP	3 MONTHS	6 MONTHS	1 YEAR	2 YEARS	3 YEARS
ALL PATIENTS (n=44)	84 ± 6 (36)	84 ± 6 (35)	81 ± 6 (27)	74 ± 7 (19)	69 ± 8 (7)
0-9 YEARS (n=19)	78 ± 10 (14)	78 ± 10 (13)	71 ± 11 (8)	51 ± 15 (4)	51 ± 15 (3)
10-14 YEARS (n=25)	88 ± 7 (22)	88 ± 7 (22)	88 ± 7 (19)	88 ± 7 (15)	79 ± 10 (4)

TABLE 39

PRIMARY CADAVER PATIENT AND GRAFT SURVIVAL 1985-1988
RELATED TO AGE

PATIENT SURVIVAL

AGE GROUP	3 MONTHS	6 MONTHS	1 YEAR	2 YEARS	3 YEARS
0-19 YEARS (n= 97)	100 ± 0 (94)	100 ± 0 (87)	100 ± 0 (71)	100 ± 0 (52)	100 ± 0 (23)
20-39 YEARS (n=400)	97 ± 1 (363)	97 ± 1 (335)	95 ± 1 (279)	94 ± 1 (175)	92 ± 2 (77)
40-59 YEARS (n=599)	95 ± 1 (530)	93 ± 1 (463)	91 ± 1 (395)	88 ± 1 (258)	84 ± 2 (102)
60-85 YEARS (n= 97)	84 ± 4 (79)	81 ± 4 (65)	78 ± 4 (46)	76 ± 5 (34)	67 ± 6 (15)

GRAFT SURVIVAL

AGE GROUP	3 MONTHS	6 MONTHS	1 YEAR	2 YEARS	3 YEARS
0-19 YEARS (n= 97)	83 ± 4 (79)	83 ± 4 (74)	82 ± 4 (57)	77 ± 5 (40)	72 ± 6 (18)
20-39 YEARS (n=400)	90 ± 2 (335)	89 ± 2 (307)	85 ± 2 (246)	82 ± 2 (149)	77 ± 3 (57)
40-59 YEARS (n=599)	86 ± 1 (477)	83 ± 2 (410)	81 ± 2 (347)	77 ± 2 (220)	72 ± 2 (83)
60-85 YEARS (n= 97)	78 ± 4 (73)	75 ± 4 (60)	72 ± 5 (44)	68 ± 5 (31)	60 ± 6 (15)

% Survival ± S.E: numbers at risk in brackets.

Figure 34.

PRIMARY CADAVER PATIENT AND GRAFT SURVIVAL 1983-1988

Related to donor age - Recipients aged 20-59 years

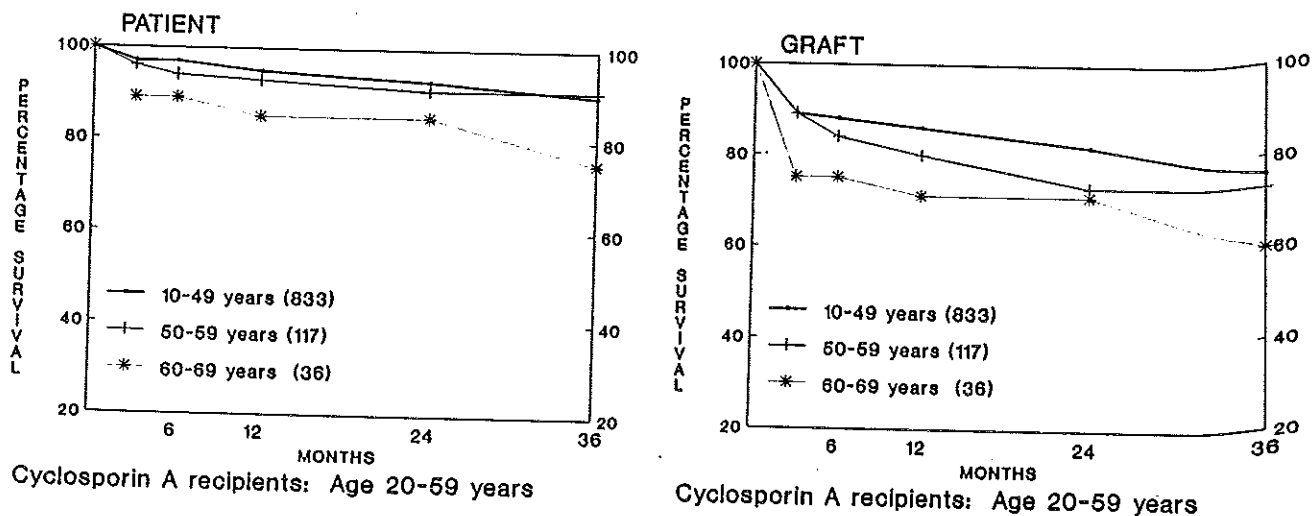


TABLE 40

PRIMARY CADAVER PATIENT AND GRAFT SURVIVAL 1983-1988

RELATED TO DONOR AGE - RECIPIENTS AGED 20-59 YEARS

PATIENT SURVIVAL

CYCLOSPORIN A RECIPIENTS

DONOR AGE GROUP	3 MONTHS	6 MONTHS	1 YEAR	2 YEARS	3 YEARS
10-49 YEARS (n=833)	97 ± 1 (761)	97 ± 1 (681)	95 ± 1 (583)	93 ± 1 (380)	90 ± 1 (207)
50-59 YEARS (n=117)	96 ± 2 (104)	94 ± 2 (95)	93 ± 3 (87)	91 ± 3 (59)	91 ± 3 (34)
60-69 YEARS (n= 36)	89 ± 5 (30)	89 ± 5 (30)	85 ± 6 (18)	85 ± 6 (12)	75 ± 11 (4)

GRAFT SURVIVAL

DONOR AGE GROUP	3 MONTHS	6 MONTHS	1 YEAR	2 YEARS	3 YEARS
10-49 YEARS (n=833)	89 ± 1 (698)	88 ± 1 (617)	86 ± 1 (523)	82 ± 1 (328)	76 ± 2 (166)
50-59 YEARS (n=117)	89 ± 3 (96)	84 ± 4 (84)	80 ± 4 (73)	73 ± 5 (45)	73 ± 5 (25)
60-69 YEARS (n= 36)	75 ± 7 (26)	75 ± 7 (26)	71 ± 8 (14)	71 ± 8 (9)	60 ± 12 (3)

TABLE 41

PATIENT SURVIVAL

AZATHIOPRINE/PREDNISOLONE RECIPIENTS

DONOR AGE GROUP	3 MONTHS	6 MONTHS	1 YEAR	2 YEARS	3 YEARS
10-49 YEARS (n=383)	92 ± 1 (352)	90 ± 2 (343)	87 ± 2 (329)	85 ± 2 (320)	81 ± 2 (280)
50-59 YEARS (n= 45)	91 ± 4 (41)	87 ± 5 (38)	82 ± 6 (35)	75 ± 7 (32)	75 ± 7 (29)
60-69 YEARS (n= 10)	100 ± 0 (10)	100 ± 0 (10)	90 ± 10 (9)	90 ± 10 (9)	90 ± 10 (8)

GRAFT SURVIVAL

DONOR AGE GROUP	3 MONTHS	6 MONTHS	1 YEAR	2 YEARS	3 YEARS
10-49 YEARS (n=383)	77 ± 2 (292)	73 ± 2 (279)	68 ± 2 (259)	64 ± 2 (240)	59 ± 3 (201)
50-59 YEARS (n= 45)	78 ± 6 (35)	71 ± 7 (31)	64 ± 7 (27)	59 ± 7 (25)	59 ± 7 (22)
60-69 YEARS (n= 10)	50 ± 16 (5)	50 ± 16 (5)	50 ± 16 (5)	40 ± 15 (4)	20 ± 13 (2)

* Survival ± S.E. numbers at risk in brackets.

SENSITISATION: 1981-1984, 1985-1988

The graft survival of first and second cadaver donor grafts in relation to cytotoxic antibody reactivity to a random cell panel is shown in Table 42 and Figure 35.

Primary Graft

Peak serum reactivity significantly influenced the survival of grafts performed in the period 1981-1984: twelve month survival 69% and 58% for 0-20% and 21-100% panel reactivity respectively.

This adverse effect of broad sensitisation on graft survival was not evident in the period 1985-1988 for Cyclosporin A treated patients: twelve month survival 85% and 83% for 0-20% and 21-100% reactivity.

When selecting the panel reactivity of the recipient's most recent serum before transplantation in 1981-1984 there was an even larger adverse effect on graft survival in highly sensitised recipients: twelve month survival of 68% and 47% of low and highly sensitised respectively. As with peak serum reactivity, so current (at transplantation) serum reactivity had no influence on graft survival in 1985-1988 in Cyclosporin A treated recipients.

Second Graft

Serum reactivity influenced graft survival in 1981-1984, particularly that of peak serum but no such adverse effect was evident in 1985-1988, either for peak or current serum reactivity.

Comment

A major success in cadaver graft transplantation has been the reduction in the adverse effect of previous cytotoxic antibody production or sensitisation on graft survival. Cyclosporin A appeared to have been associated with the striking improvement of 10-20% in twelve month survival of primary grafts and of 5-15% of second grafts.

TABLE 42

PRIMARY CADAVER GRAFT SURVIVAL RELATED TO SENSITISATION1981-1984, 1985-1988PRIMARY GRAFT

PEAK SERUM REACTIVITY

	3 MONTHS	6 MONTHS	1 YEAR	2 YEARS	3 YEARS
<u>1981 - 1984</u>					
0 - 20% (n=819)	78 ± 1 (638)	74 ± 2 (601)	69 ± 2 (563)	62 ± 2 (505)	57 ± 2 (461)
21 - 100% (n=274)	66 ± 3 (182)	62 ± 3 (171)	58 ± 3 (159)	53 ± 3 (144)	48 ± 3 (130)
<u>1985 - 1988*</u>					
0 - 20% (n=785)	89 ± 1 (644)	87 ± 1 (567)	85 ± 1 (457)	81 ± 2 (268)	76 ± 2 (91)
21 - 100% (n=234)	86 ± 2 (192)	85 ± 2 (164)	83 ± 3 (127)	80 ± 3 (73)	71 ± 4 (25)

AT TRANSPLANTATION

	3 MONTHS	6 MONTHS	1 YEAR	2 YEARS	3 YEARS
<u>1981 - 1984</u>					
0 - 20% (n=971)	76 ± 1 (742)	73 ± 1 (703)	68 ± 2 (660)	61 ± 2 (591)	55 ± 2 (536)
21 - 100% (n=107)	61 ± 5 (65)	53 ± 5 (57)	47 ± 5 (50)	44 ± 5 (47)	43 ± 5 (46)
<u>1985 - 1988*</u>					
0 - 20% (n=933)	88 ± 1 (767)	87 ± 1 (670)	84 ± 1 (537)	81 ± 1 (316)	75 ± 2 (108)
21 - 100% (n= 88)	88 ± 4 (71)	88 ± 4 (63)	87 ± 4 (49)	82 ± 5 (25)	82 ± 5 (8)

* Cyclosporin treated patients only.

SECOND GRAFT

PEAK SERUM REACTIVITY

	3 MONTHS	6 MONTHS	1 YEAR	2 YEARS	3 YEARS
<u>1981 -1984</u>					
0 - 20% (n= 65)	69 ± 6 (45)	68 ± 6 (44)	63 ± 6 (41)	58 ± 6 (38)	54 ± 6 (34)
21 - 100% (n=173)	62 ± 4 (108)	54 ± 4 (94)	50 ± 4 (86)	44 ± 4 (76)	43 ± 4 (74)
<u>1985 -1988</u>					
0 - 20% (n= 90)	83 ± 4 (73)	82 ± 4 (66)	78 ± 4 (56)	73 ± 5 (38)	63 ± 6 (15)
21 - 100% (n=145)	77 ± 4 (107)	75 ± 4 (95)	73 ± 4 (79)	70 ± 4 (53)	59 ± 5 (23)

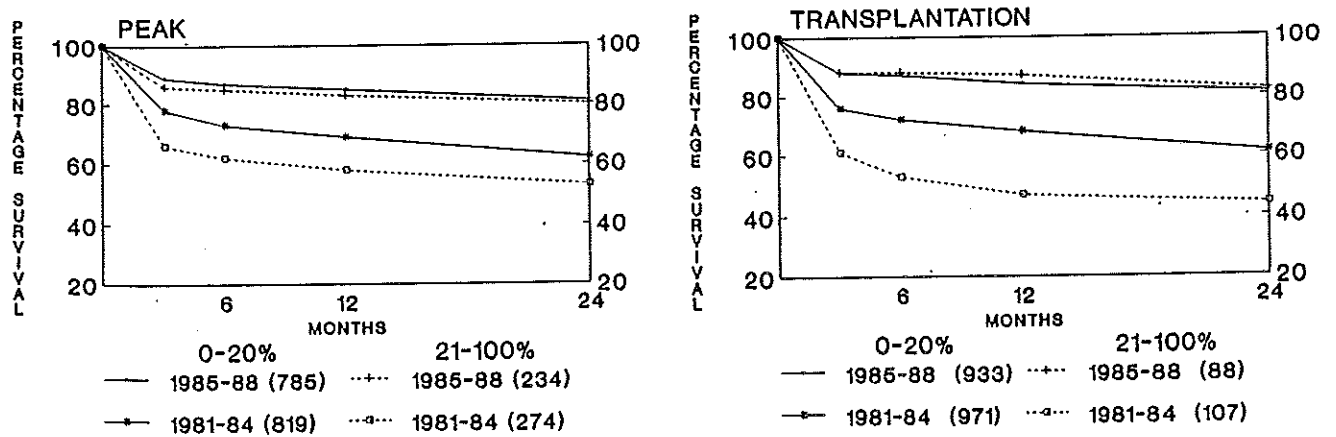
AT TRANSPLANTATION

	3 MONTHS	6 MONTHS	1 YEAR	2 YEARS	3 YEARS
<u>1981 -1984</u>					
0 - 20% (n=157)	66 ± 4 (104)	61 ± 4 (96)	55 ± 4 (87)	50 ± 4 (79)	47 ± 4 (73)
21 - 100% (n= 75)	61 ± 6 (46)	52 ± 6 (39)	49 ± 6 (37)	44 ± 6 (33)	44 ± 6 (33)
<u>1985 - 1988</u>					
0 - 20% (n=164)	80 ± 3 (126)	79 ± 3 (112)	74 ± 4 (95)	72 ± 4 (66)	59 ± 5 (28)
21 - 100% (n= 70)	77 ± 5 (53)	75 ± 5 (48)	75 ± 5 (40)	69 ± 6 (25)	65 ± 7 (10)

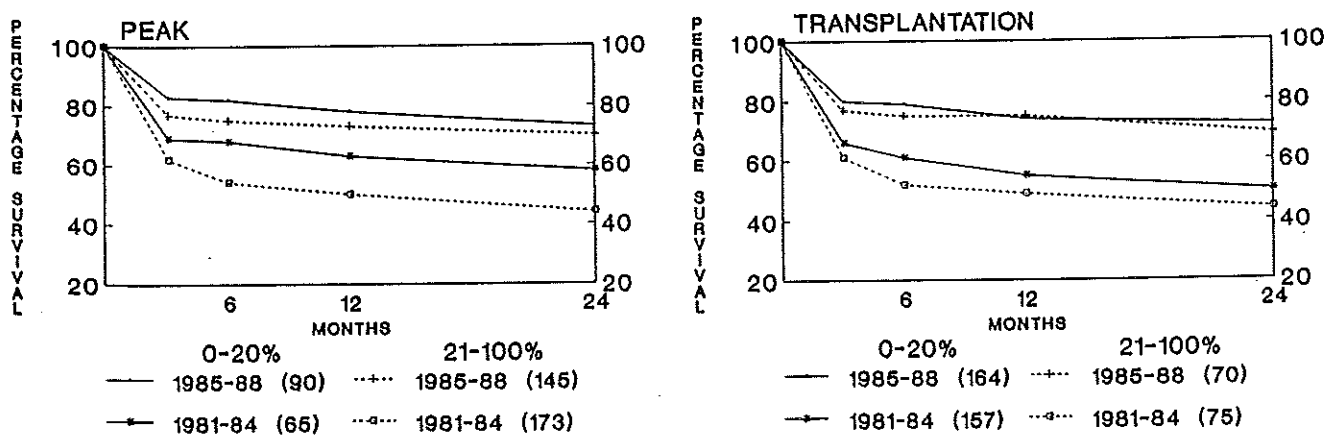
% Survival ± S.E.: numbers at risk in brackets.

Figure 35.

PRIMARY CADAVER GRAFT SURVIVAL
Related to sensitisation 1981-1984, 1985-1988



SECOND CADAVER GRAFT SURVIVAL
Related to sensitisation 1981-1984, 1985-1988



Year of transplantation

Patient survival at twelve months after receiving a cadaver donor primary graft was not significantly influenced by year of transplantation, despite the improvement in graft survival from 1983 to 1988. Factors to be considered are the proportion of elderly patients with a lower survival expectation, and the extent of risks arising from increased use of potent immunosuppressive drugs for maintenance and graft rejection treatment.

Graft survival at twelve months had improved from 74% (1983) to 83% (1987). Early indications were that the graft survival would be higher for operations in 1988. See Table 43 and Figure 36.

TABLE 43

PRIMARY CADAVER PATIENT AND GRAFT SURVIVAL

RELATED TO YEAR OF TRANSPLANTATION 1982-1988

PATIENT SURVIVAL

YEAR	3 MONTHS	6 MONTHS	1 YEAR	2 YEARS	3 YEARS
1982 (n=277)	96 $\pm$ 1 (267)	95 $\pm$ 1 (263)	94 $\pm$ 1 (259)	89 $\pm$ 2 (246)	86 $\pm$ 2 (235)
1983 (n=231)	96 $\pm$ 1 (221)	94 $\pm$ 2 (217)	91 $\pm$ 2 (209)	89 $\pm$ 2 (205)	86 $\pm$ 2 (198)
1984 (n=321)	95 $\pm$ 1 (305)	94 $\pm$ 1 (301)	91 $\pm$ 2 (293)	88 $\pm$ 2 (283)	84 $\pm$ 2 (271)
1985 (n=289)	96 $\pm$ 1 (276)	94 $\pm$ 1 (271)	92 $\pm$ 2 (265)	90 $\pm$ 2 (260)	87 $\pm$ 2 (217)
1986 (n=337)	96 $\pm$ 1 (322)	93 $\pm$ 1 (315)	93 $\pm$ 1 (312)	90 $\pm$ 2 (259)	*
1987 (n=273)	93 $\pm$ 2 (254)	92 $\pm$ 2 (252)	90 $\pm$ 2 (214)	*	*
1988 (n=294)	97 $\pm$ 1 (214)	96 $\pm$ 1 (112)	*	*	*

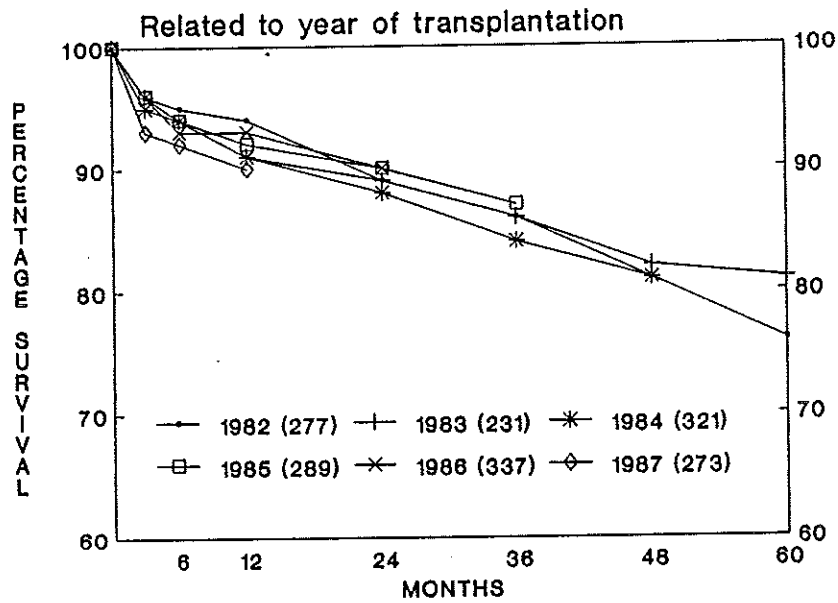
GRAFT SURVIVAL

1982 (n=277)	71 $\pm$ 3 (196)	67 $\pm$ 3 (186)	59 $\pm$ 3 (164)	52 $\pm$ 3 (145)	48 $\pm$ 3 (131)
1983 (n=231)	81 $\pm$ 3 (186)	77 $\pm$ 3 (179)	74 $\pm$ 3 (170)	69 $\pm$ 3 (159)	65 $\pm$ 3 (149)
1984 (n=321)	79 $\pm$ 2 (254)	76 $\pm$ 2 (243)	72 $\pm$ 3 (232)	65 $\pm$ 3 (208)	60 $\pm$ 3 (194)
1985 (n=289)	83 $\pm$ 2 (241)	82 $\pm$ 2 (237)	79 $\pm$ 2 (227)	75 $\pm$ 3 (217)	69 $\pm$ 3 (173)
1986 (n=337)	86 $\pm$ 2 (290)	83 $\pm$ 2 (280)	81 $\pm$ 2 (274)	77 $\pm$ 2 (223)	*
1987 (n=273)	87 $\pm$ 2 (238)	85 $\pm$ 2 (232)	83 $\pm$ 2 (193)	*	*
1988 (n=294)	88 $\pm$ 2 (195)	88 $\pm$ 2 (102)	*	*	*

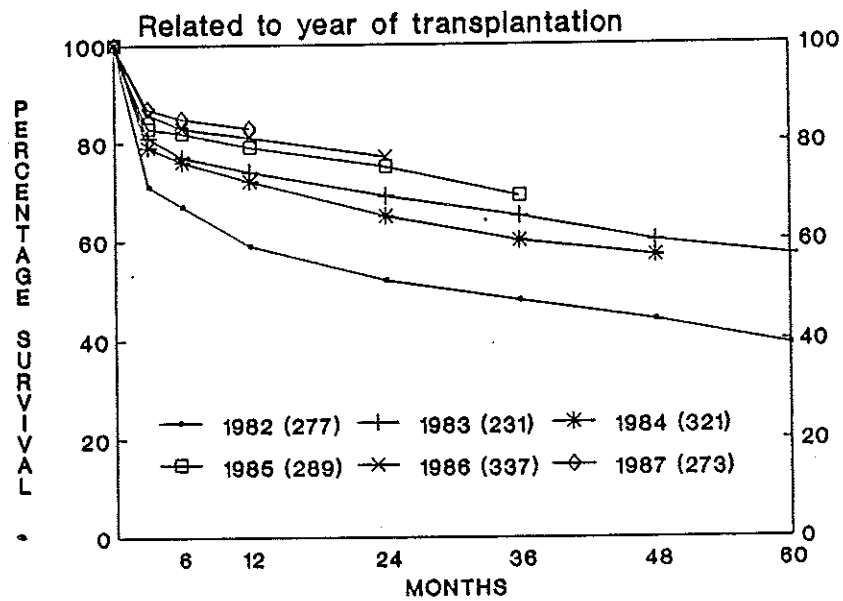
% Survival $\pm$ S.E: numbers at risk in brackets.

Figure 36.

PRIMARY CADAVER PATIENT SURVIVAL 1982-1987



PRIMARY CADAVER GRAFT SURVIVAL 1982-1987



HLA Compatibility

The influence of increasing incompatibility at the HLA B locus and DR locus and combined B + DR loci is shown in Table 44 and Figure 37.

The well matched graft had a small advantage in relation to the B locus and a moderate advantage in relation to the DR locus and the two loci combined. In contrast to previous reports from the Registry, which showed the worst graft survival for grafts mismatched for two antigens at the combined loci, the Cyclosporin A treated group during 1985-1988 showed equal result for two, three or four antigen mismatched grafts. Well matched grafts with zero or one mismatched antigen had a significantly higher expectation of twelve month survival.

As expected more grafts were well matched for the DR locus than for the B locus but the advantage in twelve months survival of such DR matched grafts over B matched grafts had disappeared by three years. Nevertheless grafts well matched (zero mismatch) for the B locus and combined B and DR loci had an increasing advantage, up to three years, over lesser mismatched grafts. Such an effect was not seen at the DR locus. The small number of grafts in some categories, at risk by three years; limits the interpretation of these observations.

Combinations of B locus and DR locus matching

When combinations of matching of the B locus and DR locus were examined in further detail, as shown in Table 45 and Figure 38, it did not appear that matching or conversely mismatching at one locus had any consistent effect, with the possible exception of increasing B mismatch on a zero DR mismatch graft. Once again small numbers have confounded assessment in most other groups.

Figure 37.

PRIMARY CADAVER GRAFT SURVIVAL WITH CYCLOSPORIN A
Related to HLA compatibility 1985-1988

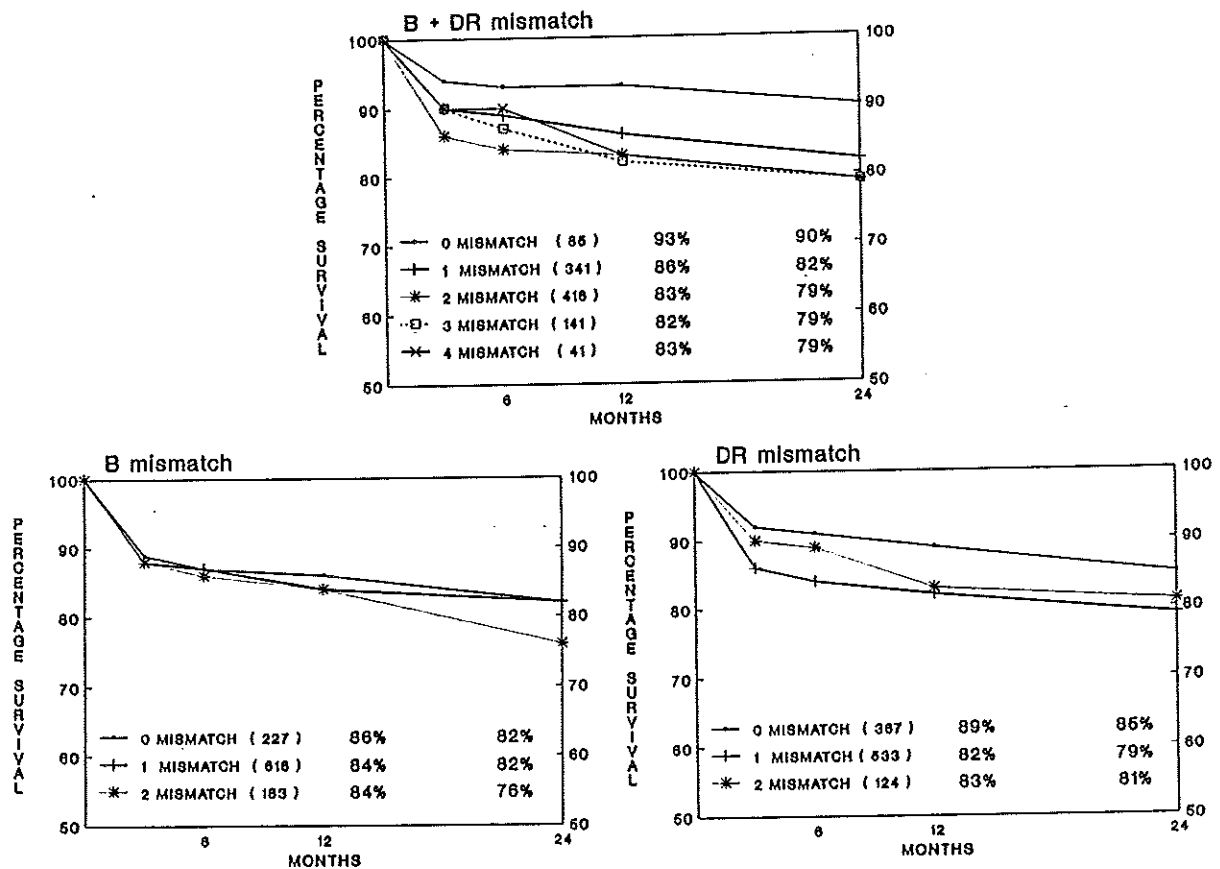


TABLE 44

PRIMARY CADAVER GRAFT SURVIVAL 1985-1988

RELATED TO HLA COMPATIBILITY

CYCLOSPORIN A

MISMATCH GRADE		B LOCUS				
		3 MONTHS	6 MONTHS	1 YEAR	2 YEARS	3 YEARS
0	(n=227)	89 ± 2 (187)	87 ± 2 (162)	86 ± 2 (130)	82 ± 3 (85)	82 ± 3 (33)
1	(n=616)	88 ± 1 (506)	87 ± 1 (443)	84 ± 2 (355)	82 ± 2 (195)	74 ± 3 (62)
2	(n=183)	88 ± 2 (151)	86 ± 3 (134)	84 ± 3 (106)	76 ± 4 (63)	69 ± 5 (21)
DR LOCUS						
0	(n=367)	92 ± 1 (315)	91 ± 2 (277)	89 ± 2 (222)	85 ± 2 (137)	79 ± 3 (49)
1	(n=533)	86 ± 2 (425)	84 ± 2 (370)	82 ± 2 (297)	79 ± 2 (171)	72 ± 3 (53)
2	(n=124)	90 ± 3 (103)	89 ± 3 (91)	83 ± 4 (71)	81 ± 4 (34)	78 ± 5 (14)
B + DR LOCUS						
0	(n= 85)	94 ± 3 (73)	93 ± 3 (65)	93 ± 3 (52)	90 ± 4 (38)	90 ± 4 (14)
1	(n=341)	90 ± 2 (286)	89 ± 2 (247)	86 ± 2 (193)	82 ± 2 (114)	77 ± 3 (41)
2	(n=416)	86 ± 2 (332)	84 ± 2 (294)	83 ± 2 (246)	79 ± 2 (137)	71 ± 3 (44)
3	(n=141)	90 ± 3 (120)	87 ± 3 (101)	82 ± 4 (76)	79 ± 4 (41)	76 ± 5 (12)
4	(n= 41)	90 ± 5 (32)	90 ± 5 (31)	83 ± 6 (23)	79 ± 7 (12)	70 ± 11 (5)

± Survival ± S.E: numbers at risk in brackets.

Figure 38.

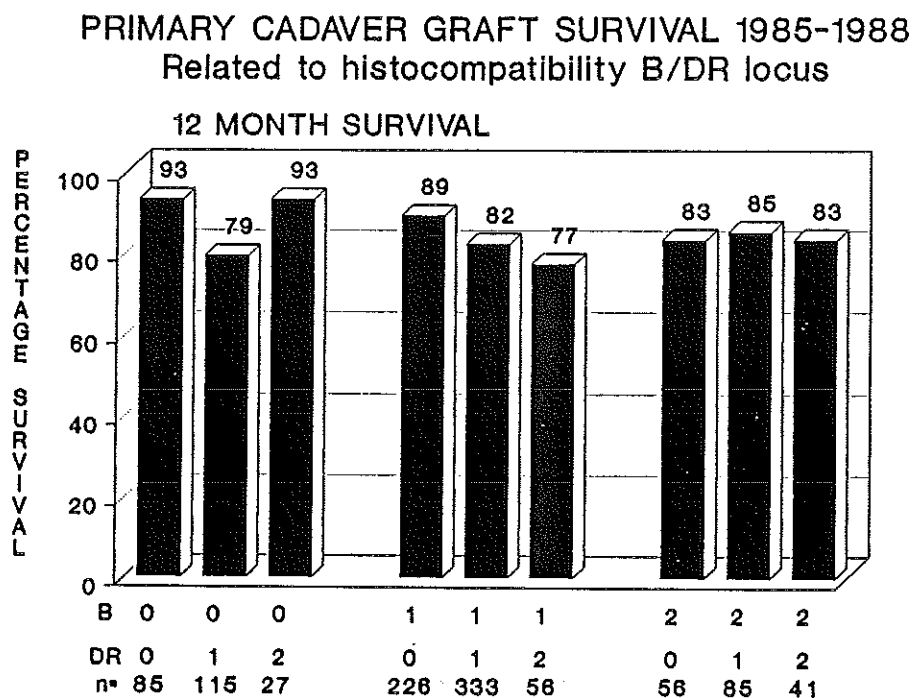


TABLE 45

PRIMARY CADAVER GRAFT SURVIVAL 1985-1988
RELATED TO HISTOCOMPATIBILITY B/DR LOCUS

B	DR	MISMATCH	3 MONTHS	6 MONTHS	1 YEAR	2 YEARS
0	0	= (n= 85)	94 ± 3 (73)	93 ± 3 (65)	93 ± 3 (52)	90 ± 4 (38)
0	1	= (n=115)	85 ± 3 (89)	82 ± 4 (76)	79 ± 4 (59)	73 ± 5 (34)
0	2	= (n= 27)	93 ± 5 (25)	93 ± 5 (21)	93 ± 5 (19)	93 ± 5 (13)
1	0	= (n=226)	92 ± 2 (197)	92 ± 2 (171)	89 ± 2 (134)	87 ± 3 (80)
1	1	= (n=333)	85 ± 2 (262)	83 ± 2 (232)	82 ± 2 (191)	80 ± 2 (105)
1	2	= (n= 56)	89 ± 4 (46)	87 ± 5 (39)	77 ± 6 (29)	77 ± 6 (9)
2	0	= (n= 56)	85 ± 4 (45)	83 ± 5 (41)	83 ± 5 (36)	69 ± 7 (19)
2	1	= (n= 85)	90 ± 3 (74)	88 ± 4 (62)	85 ± 4 (47)	80 ± 5 (32)
2	2	= (n= 41)	90 ± 5 (32)	90 ± 5 (31)	83 ± 6 (23)	79 ± 7 (12)

Cyclosporin A

% Survival ± S.E: numbers at risk in brackets.

HLA Compatibility and Sensitisation

The effect of HLA compatibility in relation to current (at transplantation) serum reactivity is shown in Table 46.

Since most recipients were unsensitised the effect of HLA is similar to that seen earlier for the group as a whole. Amongst the small group of sensitised patients, there appeared to be a trend in survival related to compatibility at the DR locus and the combined B and DR loci. The well matched grafts in these two groups enjoyed 100% survival for three years.

TABLE 46

PRIMARY CADAVER GRAFT SURVIVAL OF CYCLOSPORIN A TREATED PATIENTS RELATED TO SENSITISATION, B, DR AND B + DR LOCUS MISMATCHING 1985-1988

CURRENT ANTIBODY						
MISMATCH GRADE	B LOCUS					
	3 MONTHS	6 MONTHS	1 YEAR	2 YEARS	3 YEARS	
0-20%						
0	(n=202)	90 ± 2 (168)	88 ± 2 (145)	87 ± 3 (116)	83 ± 3 (78)	83 ± 3 (30)
1	(n=567)	88 ± 1 (466)	87 ± 1 (407)	84 ± 2 (326)	82 ± 2 (180)	74 ± 3 (58)
2	(n=169)	88 ± 3 (139)	86 ± 3 (124)	83 ± 3 (100)	75 ± 4 (60)	68 ± 5 (20)
21-100%						
0	(n= 25)	80 ± 8 (19)	80 ± 8 (17)	80 ± 8 (14)	72 ± 10 (7)	72 ± 10 (3)
1	(n= 54)	92 ± 4 (45)	92 ± 4 (41)	90 ± 4 (34)	86 ± 5 (17)	86 ± 5 (4)
2	(n= 15)	93 ± 7 (13)	93 ± 7 (11)	83 ± 11 (6)	83 ± 11 (3)	83 ± 11 (1)
DR LOCUS						
0-20%						
0	(n=342)	91 ± 2 (294)	90 ± 2 (257)	88 ± 2 (207)	84 ± 2 (131)	77 ± 3 (46)
1	(n=486)	86 ± 2 (389)	84 ± 2 (338)	82 ± 2 (270)	79 ± 2 (156)	72 ± 3 (49)
2	(n=108)	90 ± 3 (89)	89 ± 3 (80)	83 ± 4 (64)	82 ± 4 (30)	78 ± 5 (13)
21-100%						
0	(n= 27)	100 ± 0 (23)	100 ± 0 (22)	100 ± 0 (17)	100 ± 0 (7)	100 ± 0 (3)
1	(n= 50)	84 ± 5 (39)	84 ± 5 (35)	84 ± 5 (30)	77 ± 7 (16)	77 ± 7 (4)
2	(n= 17)	88 ± 8 (15)	88 ± 8 (12)	71 ± 12 (7)	71 ± 12 (4)	71 ± 12 (1)
B + DR LOCUS						
0-20%						
0	(n= 79)	93 ± 3 (67)	92 ± 3 (59)	92 ± 3 (48)	90 ± 4 (37)	90 ± 4 (13)
1	(n=306)	90 ± 2 (260)	89 ± 2 (224)	86 ± 2 (174)	82 ± 2 (105)	77 ± 3 (38)
2	(n=388)	86 ± 2 (310)	84 ± 2 (273)	83 ± 2 (228)	79 ± 2 (126)	70 ± 3 (41)
3	(n=130)	89 ± 3 (110)	86 ± 3 (94)	81 ± 4 (71)	78 ± 4 (38)	75 ± 5 (11)
4	(n= 33)	90 ± 5 (25)	90 ± 5 (25)	82 ± 7 (20)	77 ± 8 (11)	68 ± 11 (5)
21-100%						
0	(n= 6)	100 ± 0 (6)	100 ± 0 (6)	100 ± 0 (4)	100 ± 0 (1)	100 ± 0 (1)
1	(n= 37)	88 ± 5 (28)	88 ± 5 (25)	88 ± 5 (21)	83 ± 7 (10)	83 ± 7 (3)
2	(n= 31)	84 ± 7 (25)	84 ± 7 (24)	84 ± 7 (21)	79 ± 8 (12)	79 ± 8 (3)
3	(n= 11)	100 ± 0 (10)	100 ± 0 (7)	85 ± 14 (5)	85 ± 14 (3)	85 ± 14 (1)
4	(n= 9)	89 ± 10 (8)	89 ± 10 (7)	73 ± 17 (3)	73 ± 17 (1)	*

% Survival ± S.E: numbers at risk in brackets.

Immunosuppressive drugs

The patient and graft survival of primary cadaver grafts transplanted during 1985-1988 is shown in Table 47 and Figure 39 according to the initial maintenance immunosuppressive drug regime. Patient selection was limited to non-diabetics 20-59 years old.

Patient survival at one year ranged from 92% to 95% and at two years from 84% to 94%.

Graft survival at one year ranged from 81% to 87% and at two years from 75% to 83%.

The relatively small size of the groups limited valid comparison but "triple" therapy (Cyclosporin A, Azathioprine and Prednisolone) compared to "single" therapy (Cyclosporin A) showed a significant difference ($p < .05$) in graft survival.

Figure 39.

PRIMARY CADAVER PATIENT AND GRAFT SURVIVAL

Related to drug treatment 1983-1988

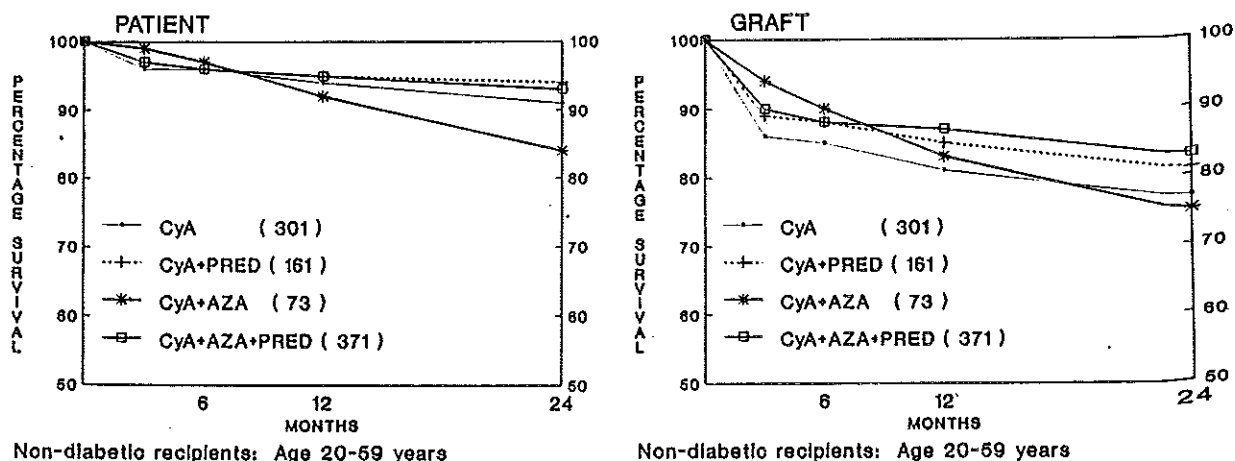


TABLE 47

SURVIVAL RELATED TO INITIAL DRUG TREATMENT 1985-1988

NON-DIABETIC RECIPIENTS AGED 20-59 YEARS

PATIENT SURVIVAL

DRUG REGIME	3 MONTHS	6 MONTHS	1 YEAR	2 YEARS
CyA (n=301)	96 ± 1 (289)	96 ± 1 (288)	94 ± 1 (282)	91 ± 2 (264)
CyA + PRED (n=161)	97 ± 1 (150)	96 ± 2 (136)	95 ± 2 (115)	94 ± 2 (67)
CyA + AZA (n= 73)	99 ± 1 (60)	97 ± 2 (45)	92 ± 4 (31)	84 ± 6 (14)
CyA + AZA + PRED (n=371)	97 ± 1 (323)	96 ± 1 (275)	95 ± 1 (205)	93 ± 2 (80)

GRAFT SURVIVAL

DRUG REGIME	3 MONTHS	6 MONTHS	1 YEAR	2 YEARS
CyA (n=301)	86 ± 2 (258)	85 ± 2 (255)	81 ± 2 (244)	77 ± 2 (223)
CyA + PRED (n=161)	89 ± 2 (137)	88 ± 3 (126)	85 ± 3 (105)	81 ± 3 (57)
CyA + AZA (n= 73)	94 ± 3 (57)	90 ± 4 (42)	83 ± 5 (28)	75 ± 7 (13)
CyA + AZA + PRED (n=371)	90 ± 2 (300)	88 ± 2 (251)	87 ± 2 (186)	83 ± 2 (67)

% Survival ± S.E: numbers at risk in brackets.

CyA = Cyclosporin A

PRED = Prednisolone

AZA = Azathioprine

INTEGRATED SURVIVAL

INTEGRATED TREATMENT SURVIVAL 1980-1988

The new patient survival with integrated dialysis and transplant treatment for the period 1980-1988 is shown in Table 48 and Figure 40. The median survival was slightly more than seven years.

The age of the patients adversely influenced expected survival with an increasing rate of mortality amongst the middle aged and elderly. Patients aged 45-59 years and 60-85 years had median survival of six and four years respectively. Younger patients aged 0-30 years and 30-44 years had a seven year survival of 85% and 70% respectively, with 2-3% annual decrement after three years.

Figure 40.

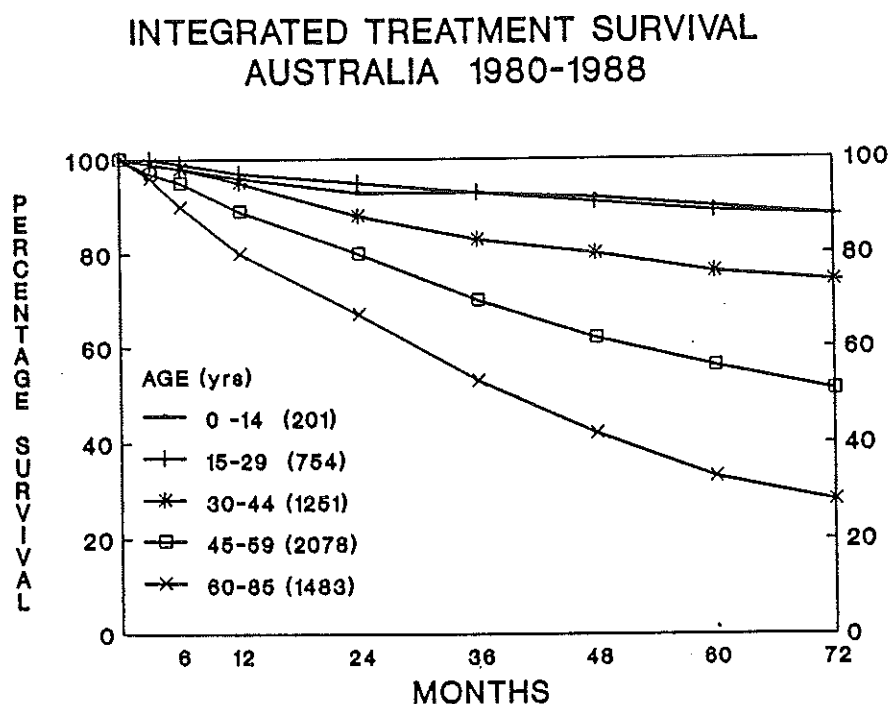


TABLE 48

INTEGRATED TREATMENT SURVIVAL - RELATED TO AGE

1980 - 1988

	1 YEAR	3 YEARS	5 YEARS	7 YEARS
<u>ALL PATIENTS</u> (n=5767)	90 ± 1 (4437)	73 ± 1 (2520)	61 ± 1 (1333)	53 ± 1 (546)
<u>AGE</u>				
0-14 YEARS (n= 201)	96 ± 1 (175)	93 ± 2 (124)	90 ± 3 (69)	85 ± 4 (26)
15-29 YEARS (n= 754)	97 ± 1 (641)	93 ± 1 (458)	89 ± 1 (293)	85 ± 2 (146)
30-44 YEARS (n=1251)	95 ± 1 (1028)	83 ± 1 (660)	76 ± 1 (380)	70 ± 2 (168)
45-59 YEARS (n=2078)	89 ± 1 (1624)	70 ± 1 (897)	56 ± 1 (459)	45 ± 2 (174)
60-85 YEARS (n=1483)	80 ± 1 (969)	53 ± 2 (386)	33 ± 2 (132)	22 ± 2 (32)

% Survival ± S.E: numbers at risk in brackets.

