

## TIMING OF LIVE DONOR TRANSPLANTS

The timing of live donor transplants is shown in Figure 8.26.

The proportion of all live donor transplants performed “pre-emptively” in Australia was 23%, compared to 27% in 2006. Forty eight percent had received dialysis treatment for twelve months or longer prior to a first live donor graft.

The proportion of pre-emptive live donor transplants in New Zealand was 43% in 2007, an increase to the previous four years. Forty one percent were waiting for twelve months or longer post dialysis.

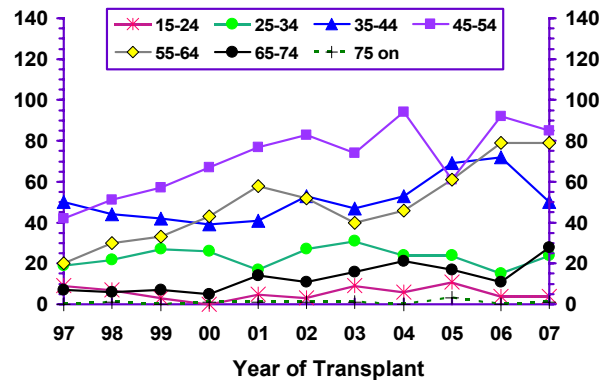
**Figure 8.26**

**Timing of Live Donor Transplantation  
for Primary Grafts in Relation to  
Date of Dialysis Start by Year of Transplant 2003 - 2007**

		2003	2004	2005	2006	2007
<b>Aust</b>	Pre-dialysis	50 (25%)	52 (24%)	72 (33%)	65 (27%)	62 (26%)
	<1 month post dialysis	5 (2%)	8 (4%)	5 (2%)	7 (3%)	7 (3%)
	1-11.9 months post dialysis	59 (30%)	62 (28%)	59 (27%)	66 (27%)	55 (23%)
	>=12 months post dialysis	84 (42%)	99 (45%)	84 (38%)	105 (43%)	116 (48%)
<b>NZ</b>	Pre-dialysis	9 (22%)	10 (21%)	10 (22%)	9 (21%)	23 (43%)
	<1 month post dialysis	-	2 (4%)	1 (2%)	-	1 (2%)
	1-11.9 months post dialysis	15 (38%)	12 (25%)	13 (29%)	12 (28%)	8 (15%)
	>=12 months post dialysis	16 (40%)	24 (50%)	21 (47%)	22 (51%)	22 (41%)

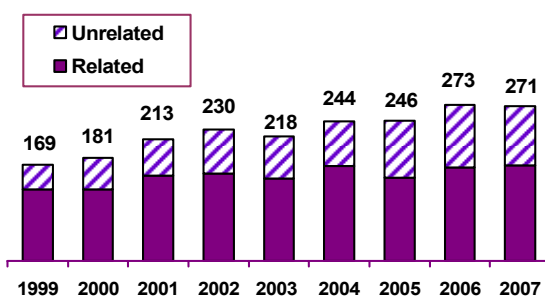
**Figure 8.27**

**Age of Live Donors in Australia 1997 - 2007**



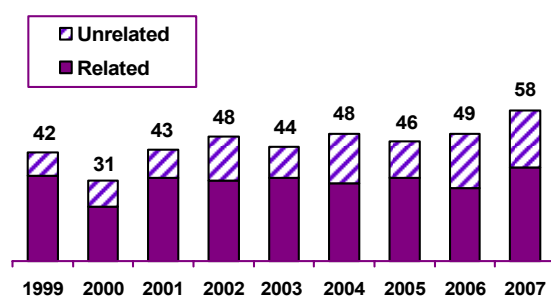
**Figure 8.28**

**Source of Live Donor Kidney  
Australia 1999 - 2007**



**Figure 8.29**

**Source of Live Donor Kidney  
New Zealand 1999 - 2007**





**Figure 8.30**

**Source of Live Donor Kidneys 2003 - 2007**  
(x = identical twin) (+ = non identical twin)

Source	Australia					New Zealand				
	2003	2004	2005	2006	2007	2003	2004	2005	2006	2007
<b>Total Live Donors</b>	<b>218</b>	<b>244</b>	<b>246</b>	<b>273</b>	<b>271</b>	<b>44</b>	<b>48</b>	<b>46</b>	<b>49</b>	<b>58</b>
<b>Related</b>	<b>(144)</b>	<b>(166)</b>	<b>(146)</b>	<b>(164)</b>	<b>(168)</b>	<b>(32)</b>	<b>(30)</b>	<b>(32)</b>	<b>(28)</b>	<b>(36)</b>
Mother	40	44	39	40	60	13	4	7	5	5
Father	30	24	30	35	37	4	5	3	3	5
Brother	23 (1x)	39	31	25	21	3	6	7	6 (1x)	5
Sister	30 (1x)	32 (1+)	26 (1+)	35 (1+)	29 (1+)	7	9	9 (1x)	6	11
Offspring	10	14	8	15	10	4	3	4	7	7
Grandfather	1	4	1	2	-	-	-	-	-	-
Grandmother	-	-	1	1	-	-	-	-	-	-
Cousin	4	4	5	4	7	-	1	1	1	2
Nephew	2	1	1	-	-	1	-	-	-	1
Niece	2	-	2	1	1	-	-	-	-	-
Uncle	1	3	1	1	2	-	1	-	-	-
Aunt	1	1	1	5	1	-	1	1	-	-
<b>Unrelated</b>	<b>(74)</b>	<b>(78)</b>	<b>(100)</b>	<b>(109)</b>	<b>(103)</b>	<b>(12)</b>	<b>(18)</b>	<b>(14)</b>	<b>(21)</b>	<b>(22)</b>
Wife	25	28	37	53	40	2	6	-	5	8
Husband	19	12	24	17	14	6	3	1	-	5
Mother-in-Law	-	-	1	1	1	-	-	-	-	-
Father-in-Law	1	-	3	-	-	-	-	-	-	-
Son-in-Law / Adoptive Son	-	1	2	-	-	-	-	-	-	-
Stepfather	1	1	2	2	1	-	-	-	-	1
Stepmother	1	-	-	-	-	-	-	-	-	-
Sister-in-Law	2	4	3	2	2	-	-	-	1	-
Brother-in-Law	1	1	-	2	3	-	-	1	-	-
Partner	2	3	7	6	6	-	-	1	1	1
Fiance / Fiancee	1	1	-	1	-	-	1	-	-	-
Friend	18	19	14	16	15	4	5	7	10	6
Stepsister / Stepson	1	-	-	1	-	-	-	-	-	-
Non-Directed	-	2	3	2	1	-	3	3	4	1
Pathological	2	6	4	4	16	-	-	-	-	-
Paired Kidney Exchange	-	-	-	-	2	-	-	-	-	-
Other	-	-	-	2	2	-	-	1	-	-

**Figure 8.31**

**Gender of Live Donor Kidneys 2004 - 2007**

Source and State/ Country of Transplant	2004			2005			2006			2007		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
<b>Related</b>												
Queensland	44%	56%	18	50%	50%	22	50%	50%	22	41%	59%	22
New South Wales/ACT	49%	51%	67	55%	45%	53	54%	46%	55	42%	58%	59
Victoria/Tasmania	44%	56%	46	37%	63%	46	37%	63%	49	39%	61%	61
South Australia/NT	56%	44%	18	42%	58%	12	42%	58%	19	42%	58%	19
Western Australia	35%	65%	17	54%	46%	13	47%	53%	19	57%	43%	7
<b>Australia</b>	<b>46%</b>	<b>54%</b>	<b>166</b>	<b>47%</b>	<b>53%</b>	<b>146</b>	<b>46%</b>	<b>54%</b>	<b>164</b>	<b>42%</b>	<b>58%</b>	<b>168</b>
<b>New Zealand</b>	<b>48%</b>	<b>52%</b>	<b>29</b>	<b>46%</b>	<b>54%</b>	<b>33</b>	<b>46%</b>	<b>54%</b>	<b>28</b>	<b>42%</b>	<b>58%</b>	<b>36</b>
<b>Unrelated</b>												
Queensland	59%	41%	17	41%	59%	22	32%	68%	19	46%	54%	22
New South Wales/ACT	40%	60%	20	48%	52%	29	34%	66%	35	42%	58%	31
Victoria/Tasmania	50%	50%	20	46%	54%	22	27%	73%	37	34%	66%	29
South Australia/NT	46%	54%	11	50%	50%	12	14%	86%	7	14%	86%	7
Western Australia	40%	60%	10	33%	67%	15	54%	46%	11	36%	64%	14
<b>Australia</b>	<b>47%</b>	<b>53%</b>	<b>78</b>	<b>44%</b>	<b>56%</b>	<b>100</b>	<b>32%</b>	<b>68%</b>	<b>109</b>	<b>38%</b>	<b>62%</b>	<b>103</b>
<b>New Zealand</b>	<b>37%</b>	<b>63%</b>	<b>19</b>	<b>31%</b>	<b>69%</b>	<b>13</b>	<b>19%</b>	<b>81%</b>	<b>21</b>	<b>46%</b>	<b>54%</b>	<b>22</b>

## TRANSPLANT SURVIVAL - PRIMARY LIVE DONOR 1991–2007

For primary live donor graft recipients, excellent early survival rates have been evident since 1991 (Figure 8.32).

Parallel improvement in graft survival is also evident. This is reassuring given the increased rates of live donor transplantation and corresponding increase in performing less ideal live donor transplants (particularly from older donors and unrelated donor transplants) (Figures 8.8 and 8.23).

Current patient and graft survival for primary live donor recipients in Australia and New Zealand are similar.

<b>Figure 8.32</b>		<b>Australia</b>			
<b>Year of Transplant</b>	<b>No. of Patients</b>	<b>% [95% Confidence Interval]</b>			
		<b>Survival</b>			
		<b>1 month</b>	<b>6 months</b>	<b>1 year</b>	<b>5 years</b>
<b>Recipient Survival</b>					
1991-1992	135	99 [95,100]	99 [94,100]	99 [94,100]	86 [79, 91]
1993-1994	160	100 [-, -]	99 [95,100]	98 [94, 99]	94 [89, 97]
1995-1996	186	100 [-, -]	98 [95, 99]	97 [94, 99]	94 [90, 97]
1997-1998	284	100 [-, -]	99 [96, 99]	98 [96, 99]	96 [93, 98]
1999-2000	320	99 [97,100]	98 [96, 99]	98 [96, 99]	94 [91, 96]
2001-2002	410	100 [98,100]	99 [97,100]	99 [97, 99]	95 [92, 97]
2003-2004	419	100 [98,100]	99 [97,100]	99 [97,100]	-
2005-2006	463	100 [98,100]	100 [98,100]	99 [98,100]	-
2007	240	100 [-, -]	99 [95, 100]		
<b>Graft Survival</b>					
1991-1992	135	96 [90, 98]	93 [88, 96]	92 [86, 95]	76 [68, 83]
1993-1994	160	97 [93, 99]	96 [91, 98]	95 [90, 97]	85 [78, 90]
1995-1996	186	93 [88, 96]	91 [86, 94]	90 [84, 93]	85 [79, 89]
1997-1998	284	98 [96, 99]	97 [94, 98]	96 [93, 98]	87 [83, 91]
1999-2000	320	97 [94, 98]	95 [92, 97]	94 [91, 96]	86 [82, 90]
2001-2002	410	98 [96, 99]	96 [94, 98]	96 [93, 97]	88 [84, 91]
2003-2004	419	99 [97,100]	98 [96, 99]	97 [95, 98]	-
2005-2006	463	98 [97, 99]	98 [96, 99]	97 [95, 98]	-
2007	240	99 [97, 100]	98 [94, 99]		

<b>Figure 8.33</b>		<b>New Zealand</b>			
<b>Year of Transplant</b>	<b>No. of Patients</b>	<b>% [95% Confidence Interval]</b>			
		<b>Survival</b>			
		<b>1 month</b>	<b>6 months</b>	<b>1 year</b>	<b>5 years</b>
<b>Recipient Survival</b>					
1991-1992	27	100 [-, -]	96 [76, 99]	96 [76, 99]	96 [76, 99]
1993-1994	35	100 [-, -]	100 [-, -]	97 [81,100]	88 [72, 95]
1995-1996	46	100 [-, -]	100 [-, -]	100 [-, -]	91 [78, 97]
1997-1998	57	100 [-, -]	100 [-, -]	100 [-, -]	89 [78, 95]
1999-2000	66	100 [-, -]	100 [-, -]	100 [-, -]	95 [86, 98]
2001-2002	83	100 [-, -]	99 [92,100]	99 [92,100]	93 [84, 97]
2003-2004	88	99 [92,100]	99 [92,100]	98 [91, 99]	-
2005-2006	88	100 [-, -]	98 [91, 99]	97 [90, 99]	-
2007	54	100 [-, -]	100 [-, -]		
<b>Graft Survival</b>					
1991-1992	27	96 [76, 99]	93 [74, 98]	93 [74, 98]	81 [61, 92]
1993-1994	35	91 [76, 97]	89 [72, 96]	89 [72, 96]	74 [56, 86]
1995-1996	46	98 [86,100]	98 [86,100]	98 [86,100]	76 [61, 86]
1997-1998	57	96 [87, 99]	96 [87, 99]	95 [85, 98]	72 [58, 82]
1999-2000	66	95 [87, 99]	94 [85, 98]	94 [85, 98]	82 [70, 89]
2001-2002	83	100 [-, -]	99 [92,100]	99 [92,100]	86 [76, 93]
2003-2004	88	97 [90, 99]	95 [88, 98]	95 [88, 98]	-
2005-2006	88	99 [92,100]	97 [90, 99]	95 [88, 98]	-
2007	54	100 [-, -]	97 [79, 100]		



Figure 8.34

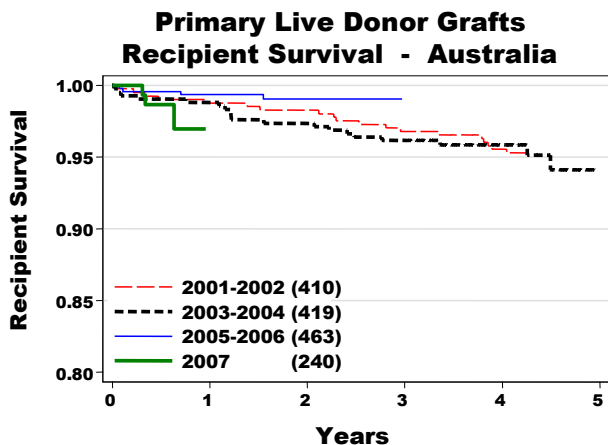


Figure 8.35

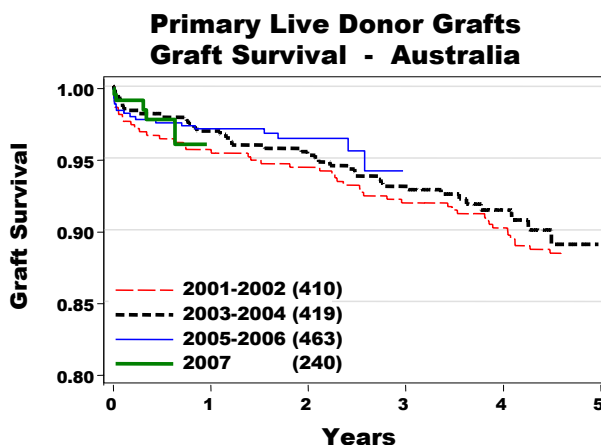


Figure 8.36

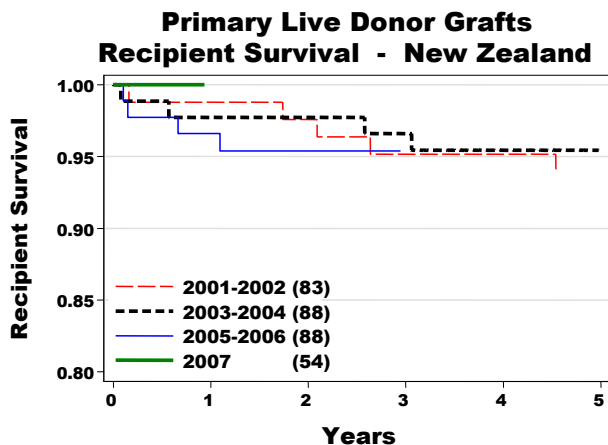
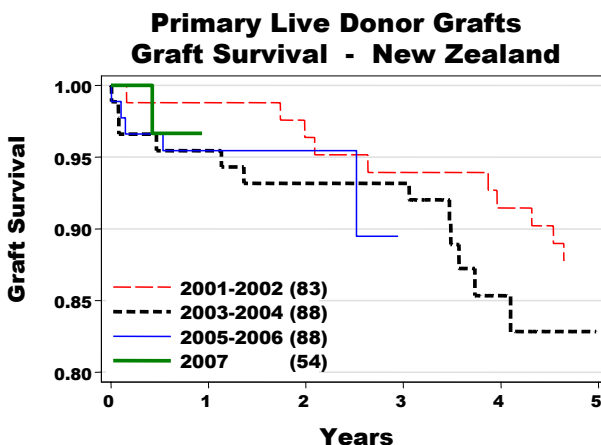


Figure 8.37



## FUNCTIONING TRANSPLANTS AT 31<sup>ST</sup> DECEMBER 2007

### TRANSPLANT OPERATIONS 1963 - 2007

#### AUSTRALIA

There have been 16,602 transplant operations performed on 14,231 patients since 1963. Of these, 7,109 grafts were functioning at 31<sup>st</sup> December 2007 (338 per million population). Fourteen percent of operations and 12% of functioning grafts were regrafts. Live donor transplants accounted for 21% of operations and 35% of functioning grafts (Figure 8.38). The number of operations performed by each hospital during this period is shown in Appendix I at the end of this Report.

The number of functioning grafts at the end of 2007 represents a 4% increase over the previous year. The annual rate of increase has remained steady (Figure 8.40 and 8.41). Eighty eight percent of the functioning grafts were primary and 65% were from deceased donors. The number of functioning grafts from live donors increased by 9% from 2006 to 2007, similar to the 10% increases each year over the past years.

The prevalence of functioning grafts in each State is shown in Figures 8.40 and 8.41. South Australia/Northern Territory has the highest prevalence of functioning renal transplants (491 per million). The lowest prevalence was in Queensland (315 per million). Patients with functioning grafts numbered in excess of those dialysis dependent in South Australia only (Appendix I).

The age relationship of functioning transplants as a proportion of patients on renal replacement therapy is shown in Figure 8.46. The proportion depending on live donor grafts is greater in the younger age groups (Figures 8.43 and 8.44).

The modal age group for transplant dependent patients was 45-54 years and the mean and median ages were 50.2 and 51.4 years respectively (Figures 8.45 and 8.46). The modal age group for live donor recipients was 45-54 years and 49% of recipients dependent on live donor grafts were less than 45 years of age.

#### NEW ZEALAND

There have been 3,272 operations performed on 2,747 patients since 1965 with 1,289 grafts (305 per million) still functioning at 31<sup>st</sup> December 2007 (Figure 8.39). Sixteen percent of operations and 11% of functioning grafts were regrafts. Kidneys from live donors accounted for 24% of operations and 38% of functioning grafts.

The number of operations performed by individual hospitals is shown in Appendix I at the end of this Report.

The age relationship and donor source are shown in Figure 8.45. The majority were male (58%) and the racial distribution was Caucasoid 78%, Maori 9%, Pacific People 6% and Asian 7% (Figure 8.48).

The majority (71%) of functioning grafts were in the 35-64 year age group and the mean and median ages were 49.4 and 50.8 years respectively. The modal age group for live donors was 35-44 years (Figure 8.45).

The 1,289 grafts functioning at the end of 2007 represent 39% of all kidneys transplanted since 1965. The longest surviving graft has reached 37 years and 5 months as at 31<sup>st</sup> December 2007. There have been 111 grafts functioning for 20 or more years and fifteen for 30 or more years (Figure 8.50).

**Figure 8.38**

<b>Summary of Renal Transplantation Australia 1963 - 2007</b>			
		Performed	Functioning*
<b>Deceased Donor</b>	First	11,097	4,040
	Second	1,716	514
	Third	273	81
	Fourth	41	15
	Fifth	4	2
	<b>Total</b>	<b>13,131</b>	<b>4,652</b>
<b>Live Donor</b>	First	3,134	2,226
	Second	287	194
	Third	42	31
	Fourth	7	6
	Fifth	1	-
	<b>Total</b>	<b>3,471</b>	<b>2,457</b>
<b>Total</b>		<b>16,602</b>	<b>7,109</b>
* Lost to follow up not included			

The majority of recipients with functioning grafts were male (60%). The ethnic origin of recipients was Caucasoid 89%, Asian 7%, Aboriginal and Torres Strait Islanders 2% and Others 2% (Figure 8.48).

The 7,109 grafts functioning at the end of 2007 represent 43% of all kidneys transplanted since 1963. Thirty four percent of grafts were functioning ten or more years and 9% for 20 or more years. There are 108 recipients with grafts functioning 30 years or longer. The longest graft had functioned for 40 years at 31<sup>st</sup> December, 2007.

**Figure 8.39**

<b>Summary of Renal Transplantation New Zealand 1965 - 2007</b>			
		Performed	Functioning*
<b>Deceased Donor</b>	First	2,034	702
	Second	379	81
	Third	73	17
	Fourth	7	-
	<b>Total</b>	<b>2,493</b>	<b>800</b>
<b>Live Donor</b>	First	713	451
	Second	60	34
	Third	6	4
	<b>Total</b>	<b>779</b>	<b>489</b>
<b>Total</b>		<b>3,272</b>	<b>1,289</b>
* Lost to follow up not included			



**Figure 8.40**

**Functioning Transplants 1996 - 2007**  
**Transplanting Region, Australia and New Zealand 1996 - 2007**  
**(Number Per Million Population)**

Year	QLD	NSW/ACT *	VIC/Tas *	SA/NT *	WA	Australia	NZ
1996	848 (254)	1555 (235)	1162 (231)	515 (311)	363 (206)	4443 (243)	824 (221)
1997	901 (265)	1644 (250)	1228 (242)	540 (324)	377 (210)	4690 (253)	882 (233)
1998	943 (274)	1689 (254)	1296 (254)	583 (347)	396 (217)	4907 (262)	936 (245)
1999	957 (273)	1729 (257)	1338 (259)	623 (369)	432 (234)	5079 (268)	983 (256)
2000	1004 (282)	1780 (262)	1388 (266)	643 (378)	468 (250)	5283 (276)	1023 (265)
2001	1063 (293)	1812 (263)	1456 (276)	669 (391)	496 (261)	5496 (283)	1063 (274)
2002	1108 (299)	1889 (272)	1538 (289)	701 (408)	528 (274)	5764 (293)	1116 (283)
2003	1148 (302)	1989 (284)	1580 (293)	735 (426)	530 (271)	5982 (301)	1168 (290)
2004	1182 (304)	2085 (296)	1650 (302)	789 (455)	561 (283)	6267 (312)	1221 (299)
2005	1220 (308)	2153 (303)	1723 (313)	811 (465)	616 (306)	6523 (321)	1239 (300)
2006	1257 (307)	2248 (314)	1831 (326)	846 (476)	655 (318)	6837 (330)	1248 (298)
2007	1317 (315)	2304 (319)	1930 (339)	883 (491)	675 (321)	7109 (338)	1289 (305)

\* For calculation of population related totals, the population of these States were combined  
 Patients lost to follow up are not included

Figure 8.41

**Functioning Transplants by Region Australia 2002 - 2007**

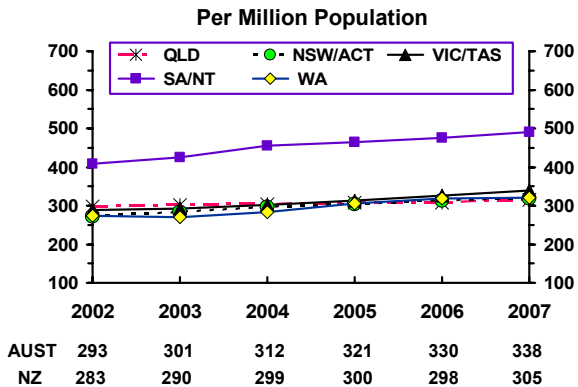


Figure 8.42

**Prevalence of Functioning Transplants (Per Million Population) 31-Dec-2007**

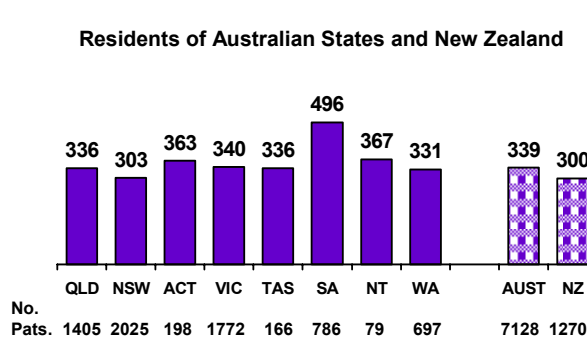


Figure 8.43

**Prevalence of Functioning Transplants As Mode of RRT by Age Group Australia 2007**

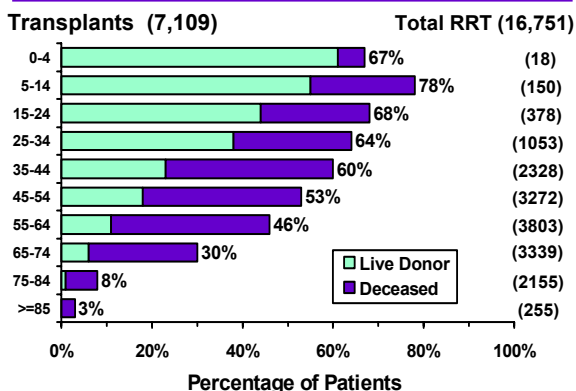
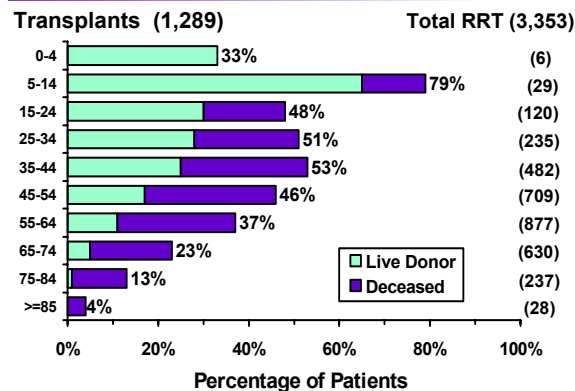


Figure 8.44

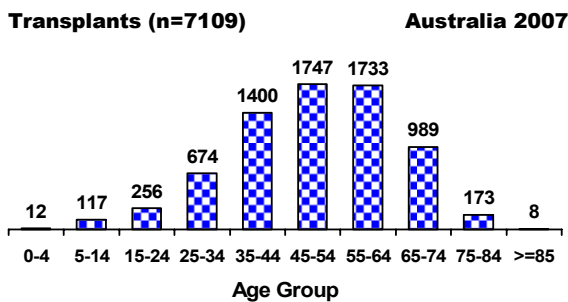
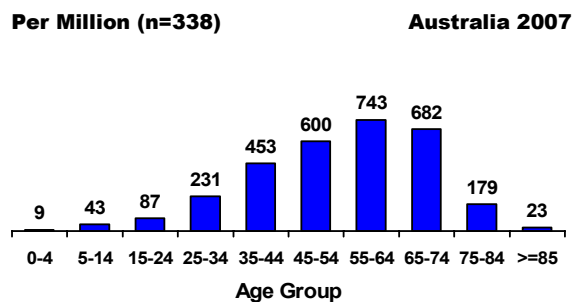
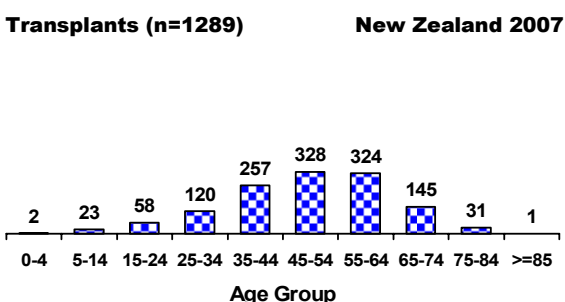
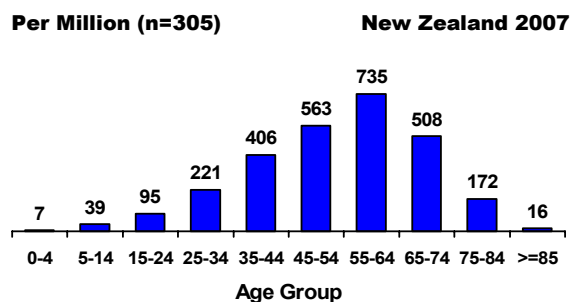
**Prevalence of Functioning Transplants As Mode of RRT by Age Group New Zealand 2007**



**Figure 8.45**

**Age of All Functioning Transplant Patients  
Resident Country at Transplant 31-Dec-2007**

Donor Source	Graft No.	Age Groups										Total
		00-04	05-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	85-94	
<b>Australia</b>		<b>12</b>	<b>117</b>	<b>256</b>	<b>674</b>	<b>1400</b>	<b>1747</b>	<b>1733</b>	<b>989</b>	<b>173</b>	<b>8</b>	<b>7109</b>
Deceased Donor	1	1	29	82	221	705	973	1155	734	132	4	4040
	2	-	4	5	49	126	134	135	47	14	-	514
	3	-	1	3	7	25	24	17	4	-	-	81
	4	-	-	-	1	6	6	1	1	-	-	13
	5	-	-	-	-	1	1	-	-	-	-	2
<b>Total</b>		<b>1</b>	<b>34</b>	<b>90</b>	<b>278</b>	<b>863</b>	<b>1138</b>	<b>1308</b>	<b>786</b>	<b>146</b>	<b>8</b>	<b>4652</b>
Live Donor	1	11	80	154	363	477	534	386	196	25	-	2226
	2	-	3	11	31	48	60	32	7	2	-	194
	3	-	-	1	1	10	12	7	-	-	-	31
	4	-	-	-	1	2	3	-	-	-	-	6
<b>Total</b>		<b>11</b>	<b>83</b>	<b>166</b>	<b>396</b>	<b>537</b>	<b>609</b>	<b>425</b>	<b>203</b>	<b>27</b>	<b>-</b>	<b>2457</b>
<b>New Zealand</b>		<b>2</b>	<b>23</b>	<b>58</b>	<b>120</b>	<b>257</b>	<b>328</b>	<b>324</b>	<b>145</b>	<b>31</b>	<b>1</b>	<b>1289</b>
Deceased Donor	1	-	4	19	47	109	176	207	110	29	1	702
	2	-	-	3	8	22	25	21	2	-	-	81
	3	-	-	-	-	6	8	1	2	-	-	17
<b>Total</b>		<b>-</b>	<b>4</b>	<b>22</b>	<b>55</b>	<b>137</b>	<b>209</b>	<b>229</b>	<b>114</b>	<b>29</b>	<b>1</b>	<b>800</b>
Live Donor	1	2	19	35	61	100	108	93	31	2	-	451
	2	-	-	1	4	18	9	2	-	-	-	34
	3	-	-	-	-	2	2	-	-	-	-	4
<b>Total</b>		<b>2</b>	<b>19</b>	<b>36</b>	<b>65</b>	<b>120</b>	<b>119</b>	<b>95</b>	<b>31</b>	<b>2</b>	<b>-</b>	<b>489</b>

**Figure 8.46**
**Age Distribution of Functioning Transplants Resident Country at Transplant**

**Age Distribution of Functioning Transplants Resident Country at Transplant**

**Figure 8.47**
**Age Distribution of Functioning Transplants Resident Country at Transplant**

**Age Distribution of Functioning Transplants Resident Country at Transplant**




**Figure 8.48**

**Functioning Transplant Patients - Resident Country at Transplant  
Related to Ethnicity and Age Group 31-Dec-2007**

Gender	Racial Origin	Prevalent Age Groups										Total
		00-04	05-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	85-94	
<b>Australia</b>		<b>12</b>	<b>117</b>	<b>256</b>	<b>674</b>	<b>1400</b>	<b>1747</b>	<b>1733</b>	<b>989</b>	<b>173</b>	<b>8</b>	<b>7109</b>
<b>Female</b>	Caucasoid	3	36	91	237	475	578	538	394	93	3	<b>2448</b>
	Aboriginal/TSI	-	-	5	4	21	24	10	3	-	-	<b>67</b>
	Asian	-	5	8	22	39	74	63	22	3	-	<b>236</b>
	Other	1	1	7	8	16	14	11	7	1	-	<b>66</b>
	<b>Total</b>	<b>4</b>	<b>42</b>	<b>111</b>	<b>271</b>	<b>551</b>	<b>690</b>	<b>622</b>	<b>426</b>	<b>97</b>	<b>3</b>	<b>2817</b>
<b>Male</b>	Caucasoid	8	69	129	360	768	926	1002	516	74	5	<b>3847</b>
	Aboriginal/TSI	-	3	1	4	18	25	22	8	-	-	<b>81</b>
	Asian	-	3	10	29	47	84	69	31	1	-	<b>274</b>
	Other	-	-	5	10	16	22	18	8	1	-	<b>80</b>
	<b>Total</b>	<b>8</b>	<b>75</b>	<b>145</b>	<b>403</b>	<b>849</b>	<b>1057</b>	<b>1111</b>	<b>563</b>	<b>76</b>	<b>5</b>	<b>4292</b>
<b>New Zealand</b>		<b>2</b>	<b>23</b>	<b>58</b>	<b>120</b>	<b>257</b>	<b>328</b>	<b>324</b>	<b>145</b>	<b>31</b>	<b>1</b>	<b>1289</b>
<b>Female</b>	Caucasoid	1	9	22	33	71	105	107	53	15	1	<b>417</b>
	Maori	-	-	4	8	10	11	7	6	2	-	<b>48</b>
	Pacific People	-	1	4	9	10	10	3	2	-	-	<b>39</b>
	Asian	-	1	2	3	7	14	6	1	-	-	<b>34</b>
	<b>Total</b>	<b>1</b>	<b>11</b>	<b>32</b>	<b>53</b>	<b>98</b>	<b>140</b>	<b>123</b>	<b>62</b>	<b>17</b>	<b>1</b>	<b>538</b>
<b>Male</b>	Caucasoid	1	9	21	49	142	144	155	55	13	-	<b>589</b>
	Maori	-	1	2	5	6	19	19	12	1	-	<b>65</b>
	Pacific People	-	2	-	8	4	11	9	5	-	-	<b>39</b>
	Asian	-	-	3	6	4	13	17	8	-	-	<b>51</b>
	Other	-	-	-	-	3	1	2	-	-	-	<b>6</b>
	<b>Total</b>	<b>1</b>	<b>12</b>	<b>26</b>	<b>67</b>	<b>159</b>	<b>188</b>	<b>201</b>	<b>83</b>	<b>14</b>	<b>-</b>	<b>751</b>

Figure 8.49

**Number and Duration of Functioning Grafts  
Australia 31-Dec-2007**

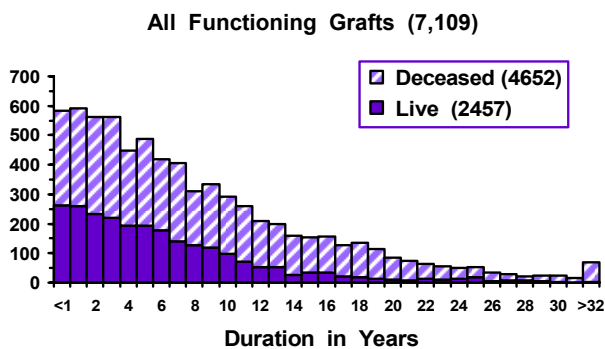
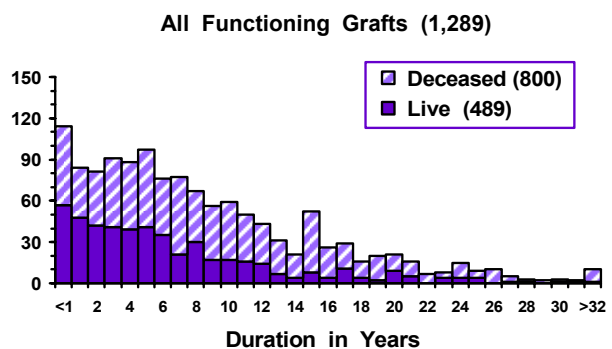


Figure 8.50

**Number and Duration of Functioning Grafts  
New Zealand 31-Dec-2007**





## RATES OF GRAFT LOSS

The rates of graft failure and death in Australia in 2007 remained the same as last year, 2.5% and 1.9% respectively; 4.4% of those at risk. These rates are continuing to decrease from previous years (Figure 8.51).

The rates of graft failure in New Zealand decreased from 3.5% to 2.9% in 2007. Death increased slightly from 2.5% to 2.9% (Figure 8.51).

The cause of graft failure from 1997 to 2007 is shown in Figure 8.52.

Chronic allograft nephropathy and death with function remain the key impediments to long term graft survival.

The importance of chronic allograft nephropathy, recurrence of primary disease and death with function as causes of graft loss after one year is evident in Figure 8.53.

Among the causes of death with functioning graft, malignancy was the most common cause.

**Figure 8.51**

Graft Loss Rate 2001 - 2007							
	2001	2002	2003	2004	2005	2006	2007
<b>Australia</b>	(5824)	(6100)	(6307)	(6632)	(6890)	(7164)	(7452)
Death with Function	2.6%	2.2%	2.2%	2.1%	2.3%	1.9%	1.9%
Graft Failure	2.7%	2.9%	2.7%	3.1%	2.7%	2.5%	2.5%
All Losses	5.3%	5.1%	4.9%	5.2%	5.0%	4.4%	4.4%
<b>New Zealand</b>	(1134)	(1180)	(1227)	(1273)	(1314)	(1329)	(1371)
Death with Function	2.2%	2.7%	2.2%	2.1%	2.3%	2.5%	2.9%
Graft Failure	3.7%	2.7%	2.5%	1.8%	3.3%	3.5%	2.9%
All Losses	5.9%	5.4%	4.7%	4.0%	5.6%	6.0%	5.9%

**Figure 8.52**

Year of Graft Loss Due to Death or Failure 1997 - 2007													
Loss	Cause of Failure	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	Total
<b>Australia</b>													
	Death with Function	109	123	117	167	152	137	141	143	158	139	144	<b>1530</b>
<b>Failed</b>	Rejection - Acute	8	11	7	9	7	8	3	5	3	7	11	<b>79</b>
	Rejection - Chronic Allograft Nephropathy	79	105	107	91	111	108	113	143	131	105	124	<b>1217</b>
	Rejection - Hyperacute	1	-	2	1	-	-	-	-	-	1	-	<b>5</b>
	Vascular	15	9	16	7	12	16	15	18	13	14	8	<b>143</b>
	Technical Problems	3	-	3	4	2	3	3	2	4	5	2	<b>31</b>
	Recurrence Primary Disease	19	10	10	15	8	15	12	13	16	23	16	<b>157</b>
	Non Compliance	7	6	5	7	7	11	10	8	6	3	7	<b>77</b>
Other	13	15	14	18	15	16	13	19	15	19	19	<b>176</b>	
<b>Total</b>		<b>254</b>	<b>279</b>	<b>281</b>	<b>319</b>	<b>314</b>	<b>314</b>	<b>310</b>	<b>351</b>	<b>346</b>	<b>316</b>	<b>331</b>	<b>3415</b>
<b>New Zealand</b>													
	Death with Function	27	25	23	28	25	32	27	28	30	34	41	<b>320</b>
<b>Failed</b>	Rejection - Acute	1	1	4	-	1	1	1	-	2	2	1	<b>14</b>
	Rejection - Chronic Allograft Nephropathy	15	19	24	20	31	22	16	15	24	31	21	<b>238</b>
	Rejection - Hyperacute	-	-	-	-	-	-	-	1	-	-	-	<b>1</b>
	Vascular	5	-	6	8	1	1	1	-	4	-	3	<b>29</b>
	Technical Problems	2	-	2	-	2	1	2	-	2	3	1	<b>15</b>
	Recurrence Primary Disease	-	3	4	3	2	1	4	2	3	6	4	<b>32</b>
	Non Compliance	-	3	-	5	2	3	3	1	1	1	6	<b>25</b>
Other	2	3	1	2	4	3	4	4	8	3	5	<b>39</b>	
<b>Total</b>		<b>52</b>	<b>54</b>	<b>64</b>	<b>66</b>	<b>68</b>	<b>64</b>	<b>58</b>	<b>51</b>	<b>74</b>	<b>80</b>	<b>82</b>	<b>713</b>



**Figure 8.53**

<b>Graft Failures 2003 - 2007</b>						
<b>Cause of Failure</b>	<b>Australia</b>			<b>New Zealand</b>		
	<b>Graft Function</b>			<b>Graft Function</b>		
	<b>&lt;1 year</b>	<b>&gt;= 1 year</b>	<b>Anytime</b>	<b>&lt;1 year</b>	<b>&gt;= 1 year</b>	<b>Anytime</b>
<b>Death with functioning Graft</b>						
Cardiac	22 (34.4%)	193 (29.2%)	215 (29.7%)	1 (8.3%)	39 (26.4%)	40 (25.0%)
Vascular	5 (7.8%)	67 (10.1%)	72 (9.9%)	2 (16.7%)	14 (9.5%)	16 (10.0%)
Infection	25 (39.1%)	90 (13.6%)	115 (15.9%)	4 (33.3%)	20 (13.5%)	24 (15.0%)
Social	1 (1.6%)	18 (2.7%)	19 (2.6%)	1 (8.3%)	5 (3.4%)	6 (3.8%)
Malignancy	6 (9.4%)	225 (34.0%)	231 (31.9%)	2 (16.7%)	63 (42.6%)	65 (40.6%)
Miscellaneous	5 (7.8%)	68 (10.3%)	73 (10.1%)	2 (16.7%)	7 (4.7%)	9 (5.6%)
<b>Total</b>	<b>64 (100%)</b>	<b>661 (100%)</b>	<b>725 (100%)</b>	<b>12 (100%)</b>	<b>148 (100%)</b>	<b>160 (100%)</b>
<b>Graft Failure</b>						
Rejection - Acute	23 (16.0%)	6 (0.8%)	29 (3.1%)	3 (10.0%)	3 (1.9%)	6 (3.2%)
Rejection - Chronic Allograft	9 (6.2%)	607 (77.3%)	616 (66.3%)	-	107 (69.0%)	107 (57.8%)
Rejection - Hyperacute	1 (0.7%)	-	1 (0.1%)	1 (3.3%)	-	1 (0.05%)
Vascular Rejection	58 (40.3%)	10 (1.3%)	68 (7.3%)	7 (23.3%)	1 (0.06%)	8 (4.3%)
Technical Problems	15 (10.4%)	1 (0.1%)	16 (1.7%)	8 (26.7%)	-	8 (4.3%)
Recurrence of Primary Disease	6 (4.2%)	74 (9.4%)	80 (8.6%)	-	19 (12.3%)	19 (10.3%)
Non Compliance	-	34 (4.3%)	34 (3.7%)	-	12 (7.7%)	12 (6.5%)
Other	32 (22.2%)	53 (6.8%)	85 (9.1%)	11 (36.7%)	13 (8.4%)	24 (13.0%)
<b>Total</b>	<b>144 (100%)</b>	<b>785 (100%)</b>	<b>929 (100%)</b>	<b>30 (100%)</b>	<b>155 (100%)</b>	<b>185 (100%)</b>

## IMMUNOSUPPRESSION

### AUSTRALIA

In Australia in 2007 Cyclosporine was used initially in 48% of patients and Tacrolimus in 49%. The proportion of patients initially using Tacrolimus has increased since 2003, so that the two agents are now used initially in similar numbers of transplants, as shown in Figure 8.54.

The number of patients still taking prednisolone two years after transplantation has increased since 2000 and is now 84%, for patients transplanted in 2005. Although only 5% of patients transplanted in 2005 commenced on TOR-inhibitors, by two years later 16% of these patients were taking TOR-inhibitors.

Caution is necessary in the interpretation of small changes in clinical practice with immunosuppressive therapy. A number of large research trials are undertaken in Australia. The drug protocol used in those studies can potentially skew the number of patients taking specific drugs in any given year.

<b>Figure 8.54</b>		<b>Australia</b>								
<b>Immunosuppressive Therapy - Primary Deceased Donor Graft 2001 - 2007</b>										
	<b>Year</b>	<b>Aza</b>	<b>CyA</b>	<b>Tacrol</b>	<b>MMF</b>	<b>Sirol</b>	<b>Everolimus</b>	<b>Pred</b>	<b>MPA</b>	<b>Number of Deceased Donor Grafts</b>
<b>Initial treatment</b>	2001	16 (6%)	215 (74%)	65 (22%)	221 (76%)	33 (11%)	1 (<1%)	277 (96%)	0 (0%)	289
	2002	9 (3%)	239 (73%)	81 (25%)	272 (83%)	7 (2%)	23 (7%)	318 (98%)	15 (5%)	326
	2003	8 (3%)	187 (68%)	77 (28%)	190 (69%)	10 (4%)	0 (0%)	258 (94%)	52 (19%)	274
	2004	5 (1%)	213 (59%)	137 (38%)	309 (85%)	10 (3%)	0 (0%)	360 (99%)	25 (7%)	362
	2005	9 (3%)	131 (41%)	175 (55%)	299 (94%)	17 (5%)	0 (0%)	308 (97%)	4 (1%)	319
	2006	0 (0%)	156 (51%)	141 (46%)	260 (85%)	3 (1%)	19 (6%)	296 (97%)	24 (8%)	306
	2007	2 (1%)	139 (48%)	141 (49%)	244 (85%)	0 (0%)	5 (2%)	285 (99%)	36 (13%)	287
<b>Treatment at 12 months</b>	2001	23 (9%)	150 (57%)	102 (39%)	205 (78%)	26 (10%)	1 (<1%)	225 (86%)	1 (<1%)	262
	2002	24 (8%)	160 (52%)	124 (41%)	240 (79%)	14 (5%)	19 (6%)	279 (91%)	11 (4%)	305
	2003	22 (9%)	124 (50%)	104 (42%)	162 (65%)	15 (6%)	0 (0%)	222 (89%)	45 (18%)	250
	2004	23 (7%)	129 (39%)	162 (49%)	236 (72%)	30 (9%)	0 (0%)	304 (93%)	46 (14%)	328
	2005	23 (8%)	84 (29%)	172 (59%)	229 (79%)	29 (10%)	3 (1%)	262 (90%)	21 (7%)	291
	2006	12 (4%)	95 (34%)	144 (52%)	215 (77%)	21 (8%)	20 (7%)	258 (93%)	26 (9%)	278
<b>Treatment at 24 months</b>	2001	31 (12%)	143 (56%)	99 (39%)	190 (74%)	23 (9%)	1 (<1%)	205 (80%)	1 (0%)	257
	2002	22 (7%)	150 (51%)	119 (40%)	232 (79%)	20 (7%)	19 (6%)	250 (85%)	14 (5%)	295
	2003	19 (8%)	104 (43%)	103 (43%)	165 (69%)	19 (8%)	0 (0%)	205 (85%)	40 (17%)	240
	2004	30 (9%)	116 (36%)	155 (48%)	219 (68%)	41 (13%)	4 (1%)	282 (88%)	45 (14%)	320
	2005	24 (9%)	76 (27%)	156 (56%)	217 (77%)	44 (16%)	5 (2%)	235 (84%)	23 (8%)	281

Aza = Azathioprine  
 CyA = Cyclosporine  
 Tacrol = Tacrolimus  
 MMF = Mycophenolate Mofetil  
 Sirol = Sirolimus  
 Pred = Prednisolone  
 MPA = Mycophenolic Acid (Enteric Coated)



## IMMUNOSUPPRESSION

### NEW ZEALAND

In New Zealand in 2007, 74% of new transplant patients received Cyclosporine and 26% received Tacrolimus. As shown in Figure 8.55, this constitutes a steady increase in the use of Tacrolimus since 2002. No transplants commenced Azathioprine at time of transplantation.

There are very few patients in New Zealand receiving TOR-inhibitors. There has been a dramatic increase in the use of Mycophenolate preparations two years after transplantation. Whereas only 7% of the 2003 cohort remained on Mycophenolate two years post transplant, 83% of the 2005 cohort were still taking Mycophenolate preparations two years later.

Caution is necessary in the interpretation of differences in practice between Australia and New Zealand. The funding of different pharmaceutical agents is quite different in the two countries.

<b>Figure 8.55</b>		<b>New Zealand</b>								
<b>Immunosuppressive Therapy - Primary Deceased Donor Graft 2001 - 2007</b>										
	<b>Year</b>	<b>Aza</b>	<b>CyA</b>	<b>Tacrol</b>	<b>MMF</b>	<b>Sirol</b>	<b>Everolimus</b>	<b>Pred</b>	<b>MPA</b>	<b>Number of Deceased Donor Grafts</b>
<b>Initial treatment</b>	2001	0 (0%)	59 (95%)	3 (5%)	62 (100%)	0 (0%)	0 (0%)	62 (100%)	0 (0%)	62
	2002	0 (0%)	57 (97%)	2 (3%)	59 (100%)	0 (0%)	0 (0%)	59 (100%)	0 (0%)	59
	2003	0 (0%)	47 (87%)	7 (13%)	46 (85%)	0 (0%)	0 (0%)	52 (96%)	3 (6%)	54
	2004	0 (0%)	47 (94%)	3 (6%)	49 (91%)	0 (0%)	0 (0%)	50 (100%)	0 (0%)	50
	2005	0 (0%)	32 (76%)	8 (19%)	41 (98%)	0 (0%)	0 (0%)	41 (98%)	0 (0%)	42
	2006	0 (0%)	26 (70%)	11 (30%)	34 (92%)	0 (0%)	3 (8%)	37 (100%)	0 (0%)	37
	2007	0 (0%)	43 (74%)	15 (26%)	57 (98%)	0 (0%)	1 (2%)	58 (100%)	0 (0%)	58
<b>Treatment at 12 months</b>	2001	27 (47%)	45 (79%)	12 (21%)	27 (47%)	0 (0%)	0 (0%)	56 (98%)	0 (0%)	57
	2002	18 (33%)	41 (76%)	13 (24%)	31 (57%)	0 (0%)	0 (0%)	53 (98%)	0 (0%)	54
	2003	15 (33%)	24 (53%)	21 (47%)	22 (49%)	1 (2%)	0 (0%)	42 (93%)	3 (7%)	45
	2004	9 (19%)	30 (64%)	17 (36%)	37 (79%)	0 (0%)	0 (0%)	45 (96%)	0 (0%)	47
	2005	2 (5%)	21 (55%)	16 (42%)	33 (87%)	2 (5%)	1 (3%)	35 (92%)	1 (3%)	38
	2006	0 (0%)	18 (55%)	15 (45%)	29 (88%)	0 (0%)	3 (9%)	32 (97%)	0 (0%)	33
<b>Treatment at 24 months</b>	2001	48 (87%)	39 (71%)	16 (29%)	3 (5%)	0 (0%)	0 (0%)	53 (96%)	0 (0%)	55
	2002	49 (92%)	39 (74%)	14 (26%)	1 (2%)	0 (0%)	0 (0%)	48 (91%)	0 (0%)	53
	2003	34 (79%)	22 (51%)	21 (49%)	3 (7%)	1 (2%)	0 (0%)	40 (93%)	2 (5%)	43
	2004	12 (27%)	27 (60%)	18 (40%)	30 (67%)	0 (0%)	0 (0%)	41 (91%)	0 (0%)	45
	2005	1 (3%)	18 (50%)	17 (47%)	30 (83%)	2 (6%)	1 (3%)	29 (81%)	1 (3%)	36

Aza = Azathioprine  
 CyA = Cyclosporine  
 Tacrol = Tacrolimus  
 MMF = Mycophenolate Mofetil  
 Sirol = Sirolimus  
 Pred = Prednisolone  
 MPA = Mycophenolic Acid (Enteric Coated)

## LONG TERM GRAFT AND PATIENT SURVIVAL AUSTRALIA AND NEW ZEALAND

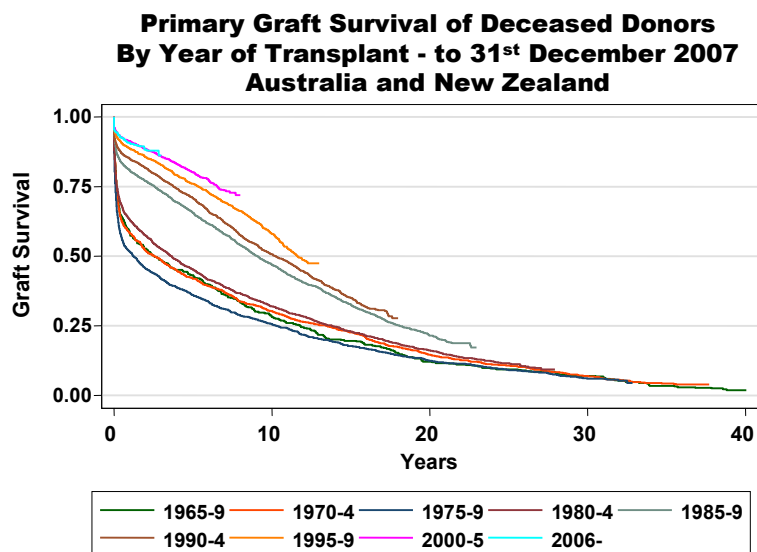
The aim of this section is to summarise the longer term outcomes of kidney transplants in a survival metric rather than as rates - that is, to describe the proportion of grafts surviving at particular time points.

As can be seen from the tables and figures, the graft survival advantage of living over deceased donor recipients and first over subsequent grafts is consistent over time. The considerable jump in survival from the 1980-84 cohort to 1985-89 coincides with the introduction of cyclosporine into routine clinical practice in Australia. Since that time there have been lesser but consistent improvements in graft survival.

**Figure 8.56**

<b>Graft and Patient Survival of Primary Grafts Deceased Donors - Australia and New Zealand</b>										
Time Period	Graft Survival					Patient Survival				
	1 yr	5 yrs	10 yrs	15 yrs	20 yrs	1 yr	5 yrs	10 yrs	15 yrs	20 yrs
1970-1974	58.2%	41.9%	30.3%	22.7%	14.6%	77.2%	57.6%	44.6%	34.3%	25.2%
1975-1979	51.6%	36.0%	25.6%	17.7%	12.5%	81.0%	63.7%	49.4%	35.5%	26.2%
1980-1984	63.2%	45.4%	32.0%	23.0%	16.2%	91.6%	75.2%	59.6%	45.9%	34.8%
1985-1989	80.9%	65.6%	47.0%	32.7%	21.6%	92.2%	80.4%	64.7%	51.4%	40.2%
1990-1994	85.0%	70.8%	50.7%	35.0%	-	93.6%	84.0%	68.0%	54.2%	-
1995-1999	88.7%	76.0%	58.1%	-	-	94.8%	86.1%	72.4%	-	-
2000-2004	91.4%	80.2%	-	-	-	95.9%	88.9%	-	-	-
2005-2007	90.5%	-	-	-	-	95.5%	-	-	-	-

**Figure 8.57**





**Figure 8.58**

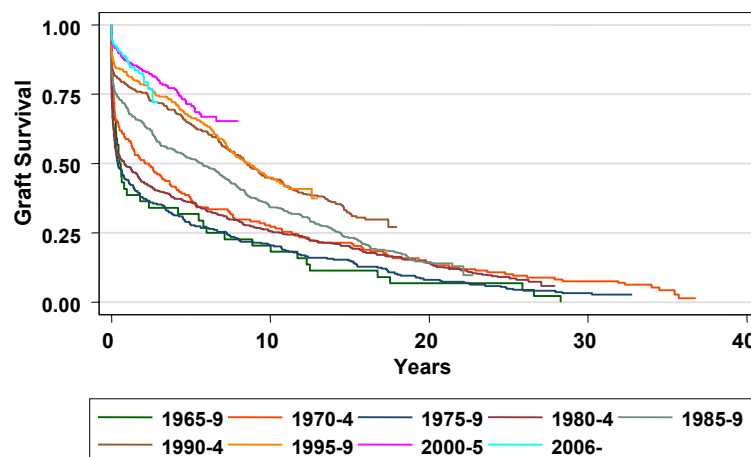
**Graft and Patient Survival of Second and Subsequent Grafts Deceased Donors - Australia and New Zealand**

Time Period	Graft Survival					Patient Survival				
	1 yr	5 yrs	10 yrs	15 yrs	20 yrs	1 yr	5 yrs	10 yrs	15 yrs	20 yrs
1970-1974	58.9%	37.3%	27.2%	21.5%	14.6%	79.6%	56.0%	42.7%	33.8%	26.8%
1975-1979	44.0%	28.2%	20.4%	15.0%	8.1%	78.2%	57.4%	44.7%	31.3%	20.0%
1980-1984	48.9%	36.0%	25.5%	20.2%	14.1%	90.7%	74.9%	58.7%	46.5%	36.9%
1985-1989	70.0%	51.7%	34.4%	23.2%	14.4%	93.7%	79.2%	62.8%	47.2%	35.3%
1990-1994	78.3%	64.2%	44.7%	31.9%	-	93.1%	82.8%	68.2%	55.3%	-
1995-1999	82.0%	66.7%	45.0%	-	-	96.0%	86.2%	73.6%	-	-
2000-2004	86.8%	71.4%	-	-	-	93.7%	88.0%	-	-	-
2005-2007	87.3%	-	-	-	-	95.7%	-	-	-	-

Note: These survival figures are calculated using the Kaplan-Meier method rather than actuarial methods or simply a proportion of transplants performed.

**Figure 8.59**

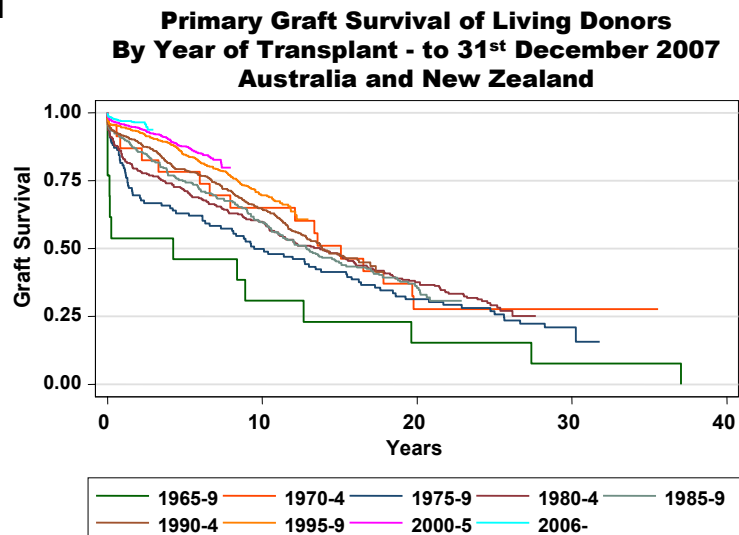
**Second and Subsequent Graft Survival of Deceased Donors By Year of Transplant - to 31<sup>st</sup> December 2007 Australia and New Zealand**



**Figure 8.60**

Graft and Patient Survival of Primary Grafts Living Donors - Australia and New Zealand										
Time Period	Graft Survival					Patient Survival				
	1 yr	5 yrs	10 yrs	15 yrs	20 yrs	1 yr	5 yrs	10 yrs	15 yrs	20 yrs
1970-1974	87.0%	78.3%	64.9%	51.0%	27.8%	91.3%	82.6%	65.2%	56.5%	47.8%
1975-1979	80.6%	63.0%	49.9%	41.4%	31.4%	90.8%	78.0%	70.6%	61.5%	52.1%
1980-1984	83.2%	71.4%	59.8%	47.6%	37.8%	96.4%	85.8%	75.6%	65.6%	56.9%
1985-1989	91.0%	75.4%	60.0%	45.0%	36.0%	95.3%	88.1%	79.9%	70.3%	62.5%
1990-1994	91.7%	79.2%	64.5%	47.3%	-	97.3%	89.1%	83.4%	74.4%	-
1995-1999	94.6%	84.5%	69.6%	-	-	98.6%	94.8%	87.2%	-	-
2000-2004	95.8%	87.6%	-	-	-	98.5%	94.3%	-	-	-
2005-2007	97.0%	-	-	-	-	98.8%	-	-	-	-

Note: These survival figures are calculated using the Kaplan-Meier method rather than actuarial methods or simply a proportion of transplants performed.

**Figure 8.61**

**Figure 8.62**

Graft and Patient Survival of Second and Subsequent Grafts Living Donors - Australia and New Zealand										
Time Period	Graft Survival					Patient Survival				
	1 yr	5 yrs	10 yrs	15 yrs	20 yrs	1 yr	5 yrs	10 yrs	15 yrs	20 yrs
1970-1974	100.0%	100.0%	-	-	-	100.0%	100.0%	-	-	-
1975-1979	72.7%	45.4%	36.4%	36.4%	-	100.0%	100.0%	81.8%	72.7%	63.6%
1980-1984	78.6%	64.3%	59.5%	50.0%	27.3%	97.6%	81.0%	78.6%	71.4%	51.9%
1985-1989	87.1%	74.2%	58.1%	45.2%	40.5%	96.8%	83.9%	71.0%	64.5%	47.3%
1990-1994	97.6%	85.4%	42.7%	37.1%	29.0%	97.6%	92.7%	75.2%	70.1%	-
1995-1999	93.3%	82.5%	70.7%	-	-	98.7%	98.7%	91.4%	-	-
2000-2004	93.6%	86.7%	-	-	-	98.2%	95.3%	-	-	-
2005-2007	97.8%	-	-	-	-	100.0%	-	-	-	-