

CHAPTER 5

HAEMODIALYSIS

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STOCK AND FLOW

AUSTRALIA

The annual stock and flow of haemodialysis patients during the period 1999-2003 is shown in Figures 5.1 and 5.2.

There were 5,851 patients (294 per million) receiving treatment at 31st December 2003, an increase of 7%; 38% were hospital based (37% in 2002), 51% were in satellite centres (limited or self-care) (49% in 2002) and 13% at home (14% in 2002). The proportion of patients receiving satellite haemodialysis increased by 11% (10% in 2002).

The proportion of all dialysis patients who were using home haemodialysis in each State was 19% for New South Wales, 12% for the ACT and less than 8% for the other States (fig 4.1).

A total of 1,667 patients received haemodialysis for the first time during the year, a 6% increase from last year; after a 2% decrease in 2002. The modal age group was 65-74 years (24%).

Of the 5,851 patients dialysing, 44% were 65 years or older and 8% less than 35 years old. There was an increase in the number of new patients commencing haemodialysis, 26% in the 15-24 year group, 7% in the 25-34 year group, 15% in the 35-44 year group and 29% in the 75-84 year group (fig 5.3).

Figure 5.1

Stock and Flow of Haemodialysis Patients 1999 - 2003

	1999	2000	2001	2002	2003
Australia					
Patients new to HD	1526	1519	1607	1572	1667
First Dialysis Treatment	1303	1286	1380	1345	1411
Previous Dialysis (PD)	188	207	198	200	226
Failed Transplant	35	26	29	27	30
Transplanted	329	362	383	393	372
Deaths	644	684	771	713	832
Never Transplanted	575	619	707	652	757
Previous Transplant	69	65	64	61	75
Permanent Transfers Out (>12 months)	221	254	269	235	312
Temporary Transfers (<12 months)	153	156	128	116	76
Patients Dialysing at 31 December	4343	4674	5043	5480	5851
Patients Dialysing at Home 31 December	706	742	773	777	772
% of all Home Dialysis Patients	30%	30%	30%	31%	30%
New Zealand					
Patients new to HD	259	356	336	336	352
First Dialysis Treatment	189	264	277	288	286
Previous Dialysis (PD)	62	81	53	41	61
Failed Transplant	8	11	6	7	5
Transplanted	62	50	60	61	64
Deaths	93	106	127	109	132
Never Transplanted	85	95	114	99	115
Previous Transplant	8	11	13	10	17
Permanent Transfers Out (>12 months)	79	116	91	119	122
Temporary Transfers (<12 months)	32	37	18	30	15
Patients Dialysing at 31 December	562	655	754	827	930
Patients Dialysing at Home 31 December	179	188	200	228	234
% of all Home Dialysis Patients	21%	22%	22%	23%	23%

The proportion of all dialysis patients in each age group who were using haemodialysis is shown in Figure 5.6.

For more detail regarding age and mode of haemodialysis in each State see Appendix II at the Website (www.anzdata.org.au/ANZDATA/AnzdataReport/download.htm).

There were 372 transplant operations, a 5% decrease from 2002; representing 6% of all patients dialysing and 10% of those patients <65 years. Thirty two patients aged ≥65 years were transplanted.

There were 832 deaths, representing 14.7 deaths per 100 patient years (11.2% of patients at risk) (fig 3.8).

For more detail of cause of death see Appendix II at the Website (www.anzdata.org.au/ANZDATA/AnzdataReport/download.htm).

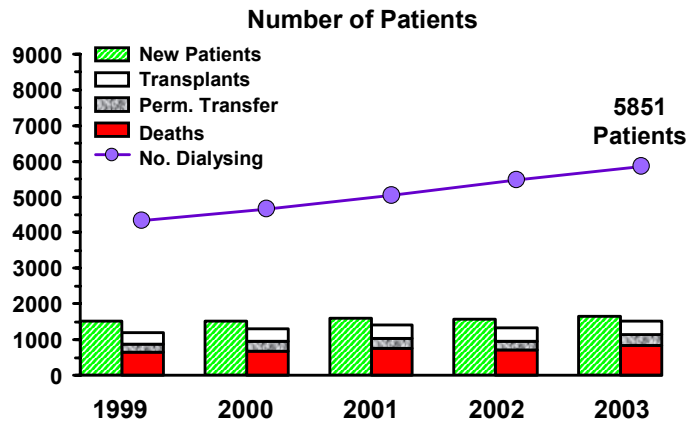
NEW ZEALAND

The annual stock and flow of haemodialysis patients during the period 1999-2003 is shown in Figure 5.4 and 5.5.

There were 930 patients (232 per million) receiving treatment at 31st December 2003, a 12% increase compared to 2002. Hospital based haemodialysis increased from last year to 46% (45% in 2002), satellite haemodialysis remained the same at 28% and home haemodialysis decreased from 28% in 2002 to 25% this year.

There was a 5% increase in the number of new haemodialysis patients in the survey period. In 2001 and 2002 the number had remained the same.

Modal age group for new patients was 65-74 years (26%); 36% were ≥65 years and 10% <35 years (fig 5.5).

Figure 5.2
**Stock and Flow of Haemodialysis Patients
Australia 1999 - 2003**

Figure 5.3
Australia
**Stock and Flow of Haemodialysis 1999 - 2003
Number (%)**

Age Groups	1999	2000	2001	2002	2003
New Patients *					
00-14 years	10 (<1%)	5 (<1%)	13 (<1%)	11 (<1%)	9 (<1%)
15-24 years	47 (3%)	56 (4%)	43 (3%)	38 (3%)	48 (3%)
25-34 years	102 (7%)	107 (7%)	106 (7%)	85 (5%)	91 (5%)
35-44 years	173 (11%)	151 (10%)	178 (11%)	136 (9%)	156 (9%)
45-54 years	268 (17%)	254 (17%)	274 (17%)	270 (17%)	277 (17%)
55-64 years	306 (20%)	295 (19%)	318 (20%)	320 (20%)	315 (19%)
65-74 years	419 (28%)	406 (27%)	416 (26%)	421 (27%)	407 (24%)
75-84 years	193 (13%)	237 (16%)	249 (15%)	270 (17%)	347 (21%)
>=85 years	8 (<1%)	8 (<1%)	10 (<1%)	20 (1%)	17 (1%)
Total	1526 (100%)	1519 (100%)	1607 (100%)	1572 (100%)	1667 (100%)
Patients Dialysing					
00-14 years	10 (<1%)	7 (<1%)	13 (<1%)	11 (<1%)	3 (<1%)
15-24 years	98 (2%)	93 (2%)	94 (2%)	102 (2%)	101 (2%)
25-34 years	346 (8%)	354 (8%)	356 (7%)	348 (6%)	340 (6%)
35-44 years	562 (13%)	595 (13%)	605 (12%)	568 (10%)	603 (10%)
45-54 years	784 (18%)	815 (17%)	893 (18%)	949 (17%)	999 (17%)
55-64 years	895 (21%)	949 (20%)	1018 (20%)	1160 (21%)	1220 (21%)
65-74 years	1106 (26%)	1186 (25%)	1298 (26%)	1401 (26%)	1455 (25%)
75-84 years	523 (12%)	646 (14%)	737 (15%)	883 (16%)	1057 (18%)
>=85 years	19 (<1%)	29 (<1%)	29 (<1%)	58 (1%)	73 (1%)
Total	4343 (100%)	4674 (100%)	5043 (100%)	5480 (100%)	5851 (100%)
Primary Renal Disease *					
Glomerulonephritis	475 (32%)	483 (32%)	458 (28%)	420 (27%)	446 (27%)
Analgesic Nephropathy	82 (5%)	63 (4%)	86 (5%)	64 (4%)	67 (4%)
Hypertension	167 (11%)	199 (13%)	217 (13%)	244 (16%)	263 (16%)
Polycystic Disease	106 (7%)	99 (6%)	100 (6%)	87 (6%)	81 (5%)
Reflux Nephropathy	68 (4%)	69 (5%)	60 (4%)	57 (3%)	61 (3%)
Diabetic Nephropathy	357 (23%)	330 (22%)	383 (24%)	427 (27%)	432 (26%)
Miscellaneous	158 (10%)	179 (12%)	179 (11%)	181 (11%)	202 (12%)
Uncertain	113 (8%)	97 (6%)	124 (8%)	92 (6%)	115 (7%)
Total	1526 (100%)	1519 (100%)	1607 (100%)	1572 (100%)	1667 (100%)

* New patients receiving first haemodialysis treatment



Figure 5.4

**Stock and Flow of Haemodialysis Patients
New Zealand 1999 - 2003**

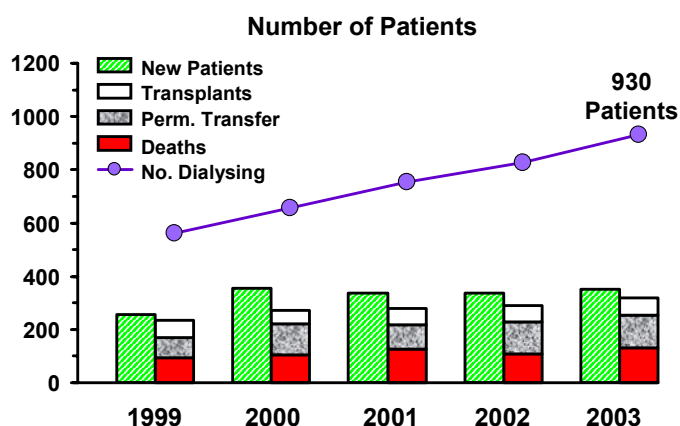


Figure 5.5		New Zealand				
Stock and Flow of Haemodialysis		1999 - 2003				
Number (%)						
Age Groups	1999	2000	2001	2002	2003	
New Patients *						
00-14 years	2 (<1%)	2 (<1%)	5 (1%)	1 (<1%)	0 (0%)	
15-24 years	8 (3%)	21 (6%)	9 (3%)	13 (4%)	20 (5%)	
25-34 years	22 (8%)	29 (8%)	19 (6%)	19 (6%)	14 (4%)	
35-44 years	25 (10%)	36 (10%)	43 (13%)	32 (10%)	35 (10%)	
45-54 years	58 (22%)	78 (22%)	78 (23%)	75 (22%)	67 (19%)	
55-64 years	75 (29%)	107 (30%)	84 (25%)	113 (34%)	88 (25%)	
65-74 years	42 (16%)	57 (16%)	75 (22%)	65 (19%)	90 (26%)	
75-84 years	26 (10%)	26 (7%)	22 (7%)	16 (5%)	38 (11%)	
>=85 years	1 (<1%)	0 (0%)	1 (<1%)	2 (<1%)	0 (0%)	
Total	259 (100%)	356 (100%)	336 (100%)	336 (100%)	352 (100%)	
Patients Dialysing						
00-14 years	4 (<1%)	2 (<1%)	3 (<1%)	2 (<1%)	0 (0%)	
15-24 years	22 (4%)	36 (6%)	30 (4%)	29 (3%)	32 (3%)	
25-34 years	52 (9%)	64 (9%)	59 (8%)	64 (8%)	64 (7%)	
35-44 years	100 (18%)	96 (15%)	124 (16%)	114 (14%)	114 (12%)	
45-54 years	126 (22%)	145 (22%)	184 (24%)	188 (23%)	210 (23%)	
55-64 years	137 (24%)	179 (27%)	192 (26%)	230 (28%)	257 (28%)	
65-74 years	95 (17%)	95 (15%)	126 (17%)	160 (19%)	192 (21%)	
75-84 years	26 (5%)	38 (6%)	36 (5%)	40 (5%)	61 (6%)	
>=85 years	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	
Total	562 (100%)	655 (100%)	754 (100%)	827 (100%)	930 (100%)	
Primary Renal Disease *						
Glomerulonephritis	74 (29%)	103 (29%)	97 (29%)	77 (23%)	87 (25%)	
Analgesic Nephropathy	2 (<1%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	
Hypertension	25 (11%)	52 (15%)	37 (11%)	32 (10%)	39 (11%)	
Polycystic Disease	14 (5%)	11 (3%)	24 (7%)	12 (4%)	13 (4%)	
Reflux Nephropathy	6 (2%)	19 (5%)	7 (2%)	11 (3%)	3 (1%)	
Diabetic Nephropathy	103 (39%)	124 (35%)	123 (37%)	155 (46%)	146 (41%)	
Miscellaneous	21 (8%)	30 (8%)	31 (9%)	38 (11%)	39 (11%)	
Uncertain	14 (5%)	17 (5%)	17 (5%)	11 (3%)	25 (7%)	
Total	259 (100%)	356 (100%)	336 (100%)	336 (100%)	352 (100%)	

* New patients receiving first haemodialysis treatment

Figure 5.6

Proportion (%) of Patients aged ≥ 65 years Treated with Home Haemodialysis 1999 - 2003

State	1999	2000	2001	2002	2003
Queensland	1%	2%	1%	2%	2%
New South Wales	7%	7%	6%	6%	7%
Aust.Capital Territory	6%	7%	8%	7%	7%
Victoria	3%	2%	3%	2%	2%
Tasmania	0%	0%	0%	0%	0%
South Australia	2%	<1%	2%	2%	<1%
Northern Territory	0%	0%	0%	0%	0%
Western Australia	<1%	<1%	<1%	<1%	<1%
Australia	4%	3%	4%	4%	4%
New Zealand	7%	5%	5%	5%	5%

Figure 5.7

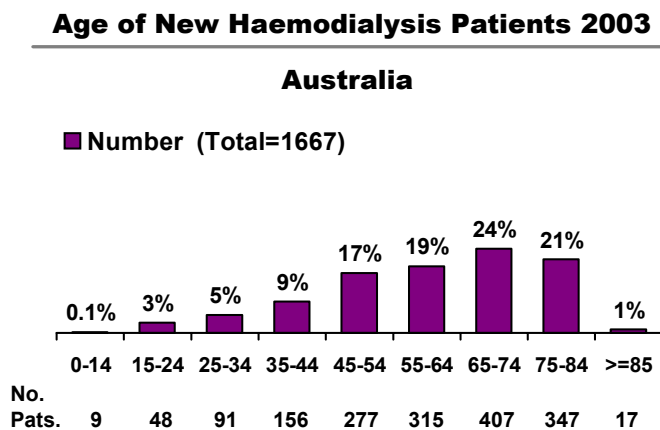
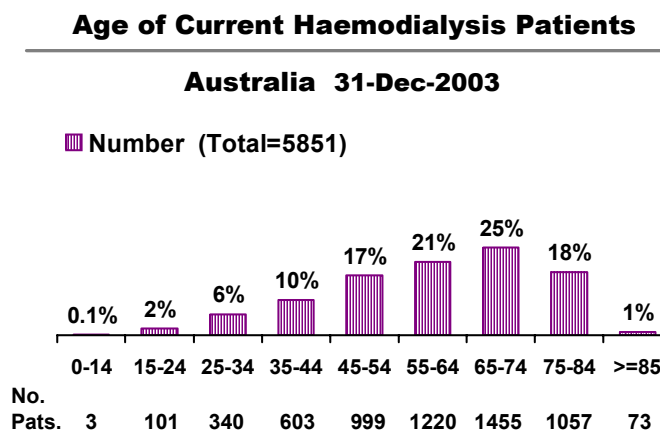


Figure 5.8





NEW ZEALAND (continued)

There were 352 patients who received haemodialysis for the first time, a 5% increase from 2002, 81% having their initial dialysis treatment. The modal age group was 45-74 years (70%), 10% were <35 years and 37% >=65 years (fig 5.5 and 5.9, and Appendix III at the Website (www.anzdata.org.au/ANZDATA/AnzdataReport/download.htm)).

Sixty-four haemodialysis patients received transplants in 2003 (61 in 2002), representing 7% of all patients dialysing and 9% of those patients <65 years.

There were 132 deaths, at a rate of 15.0 deaths per 100 patient years of treatment, (10.5% of patients at risk) (fig 3.10).

Figure 5.9

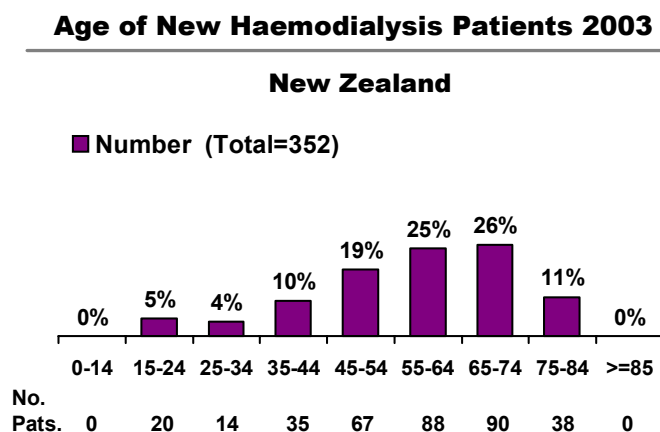
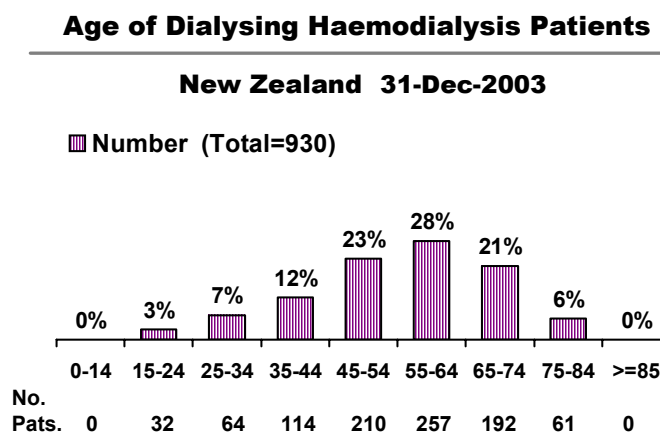


Figure 5.10



BLOOD FLOW RATES

AUSTRALIA

The previous trend towards a prescribed blood flow rate of 300 mls/minute or higher has flattened: this group remained the same as last year at 76% of all patients. In March 1997 it was 47%. Only 6% were now prescribed less than 250 mls/minute.

Blood flow rates are lower in patients dialysing using central venous catheters than in those using fistulae or grafts (fig 5.12).

NEW ZEALAND

In March 2004, 71% of patients were prescribed 300 mls/minute or higher compared to 67% in 2003, 55% in 2002 and 21% in 1997. There were 8% still using <250 mls/minute, many of these receiving long session duration dialysis.

Figure 5.11

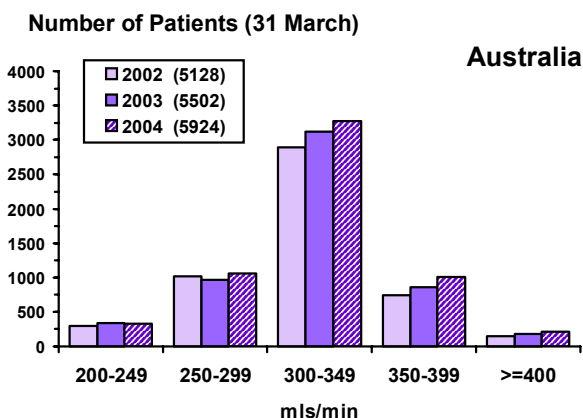
Blood Flow Rates (mls/minute) 1997 - 2004								
Country	No. Pts	Mls/Minute						
		<200	200-249	250-299	300-349	350-399	>400	
Aust	March 2004	5924	<1%	6%	18%	55%	17%	4%
	March 2003	5502	<1%	6%	18%	57%	16%	3%
	March 2002	5128	<1%	6%	20%	56%	15%	3%
	March 2001	4717	<1%	7%	23%	55%	11%	3%
	March 2000	4374	1%	8%	26%	54%	9%	2%
	March 1999	4029	1%	10%	29%	51%	8%	1%
	March 1998	3590	1%	10%	33%	49%	6%	1%
	March 1997	3342	<1%	15%	37%	43%	4%	<1%
NZ	March 2004	938	<1%	8%	21%	45%	23%	3%
	March 2003	826	<1%	10%	23%	43%	23%	1%
	March 2002	761	<1%	15%	30%	37%	17%	1%
	March 2001	679	1%	13%	34%	36%	15%	1%
	March 2000	575	1%	19%	37%	35%	8%	<1%
	March 1999	501	1%	25%	40%	26%	8%	0%
	March 1998	441	1%	25%	44%	28%	2%	0%
	March 1997	390	1%	30%	47%	21%	<1%	0%

Figure 5.12

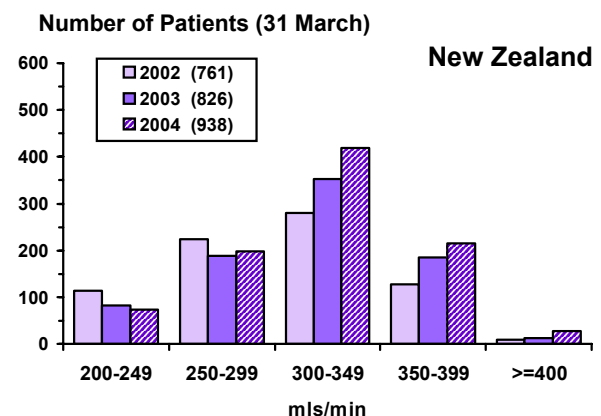
Blood Flow Rate and Type of Access March 2004						
Blood Flow Rate	Australia			New Zealand		
	Native	Grafts	Catheters	Native	Grafts	Catheters
<200	23 (<1%)	1 (<1%)	11 (2%)	2 (<1%)	-	3 (1%)
200-249	181 (4%)	38 (4%)	115 (20%)	51 (8%)	1 (1%)	21 (9%)
250-299	637 (14%)	187 (20%)	242 (41%)	100 (16%)	22 (24%)	76 (33%)
300-349	2509 (57%)	576 (62%)	190 (32%)	247 (40%)	51 (54%)	121 (53%)
350-399	861 (20%)	118 (13%)	26 (4%)	186 (30%)	20 (21%)	9 (4%)
>=400	196 (4%)	12 (1%)	1 (<1%)	28 (5%)	-	-
Total	4407 (100%)	932 (100%)	585 (100%)	614 (100%)	94 (100%)	230 (100%)

Figure 5.13

Distribution of Blood Flow Rates



Distribution of Blood Flow Rates





FREQUENCY AND HOURS OF DIALYSIS

Figure 5.14

Duration and Number of Treatments Per Week 31-Mar-2004

Sessions per week	Hours of Each Treatment										Total
	<2.5	2.5-2.9	3-3.4	3.5-3.9	4-4.4	4.5-4.9	5-5.4	5.5-5.9	6-6.4	> 6.5	
Australia											
1	0	0	1	0	3	0	0	0	0	0	4
2	1	2	17	8	41	3	14	1	0	1	88
2.5	0	0	0	0	2	0	0	0	0	0	2
3	2	4	143	233	2490	998	1416	111	88	34	5519
3.5	0	0	1	2	21	11	26	7	15	35	118
4	0	1	21	11	21	16	7	0	6	8	91
5	0	3	18	3	8	2	2	0	0	5	41
6	10	20	11	1	0	1	0	0	0	16	59
7	0	2	0	0	0	0	0	0	0	0	2
Total	13	32	212	258	2586	1031	1465	119	109	99	5924
New Zealand											
2	0	0	1	0	5	1	4	0	0	0	11
3	0	0	14	12	341	180	277	21	29	22	896
3.5	0	1	0	0	0	3	0	1	2	3	10
4	0	0	0	0	2	1	6	1	0	0	10
5	0	0	2	0	1	0	0	0	0	1	4
6	0	0	5	0	0	0	1	0	0	0	6
7	0	0	0	1	0	0	0	0	0	0	1
Total	0	1	22	13	349	185	288	23	31	26	938

AUSTRALIA

Figures 5.14-5.18.

Of the 5,924 patients, there were still 88 receiving dialysis twice a week (1.5%); the great majority (93%) dialysed three times per week.

Of the patients dialysing three times per week 30% were dialysing for five hours or longer, the same as in 2003; only 7% (7% 2003) received less than four hours. Forty five percent of patients dialysed for 4-4.4 hours.

The median weekly dialysis treatment period for all haemodialysis patients was 12 hours; range 3-50 hours.

The number of people dialysing five or more days per week continues to rise. The trends in more frequent dialysis are illustrated in Figure 5.16.

Sixty five percent of patients dialysing for longer than 5.5 hours and 66% of patients dialysing more than three times a week were dialysing at home.

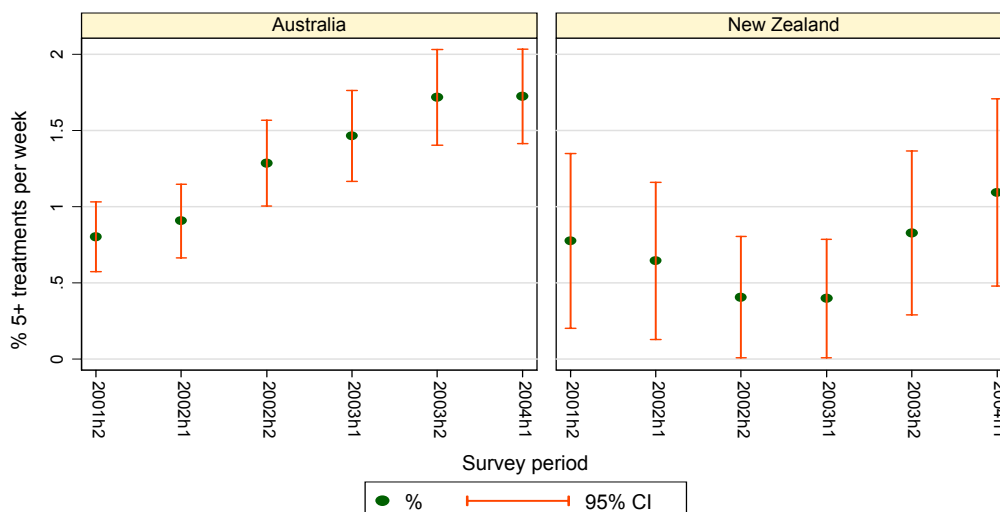
Figure 5.15

Duration of Haemodialysis Per Week 31-Mar-2004

Country	No. Pts	Hours of Haemodialysis Per Week							
		<9	9-11	12-14	15-17	18-20	21-23	24-26	>27
Aust	5664	1%	7%	61%	27%	2%	<1%	<1%	<1%
NZ	927	1%	3%	56%	33%	4%	<1%	2%	<1%

Excludes patients on haemofiltration and haemodiafiltration
Frequency between 2 and 4 sessions weekly

Figure 5.16



NEW ZEALAND

Figures 5.14-5.18.

There were 896 patients (96%) dialysing three times per week. The proportion on frequent ≥ 5 times a week dialysis is steady.

The majority (89%) dialysed between four and less than five and a half hours, three times a week. Only 26 patients (3%) dialysed for less than four hours.

The remainder dialysed for five and a half or more hours, three times a week.

Median weekly treatment for all haemodialysis patients was 13 hours, range 6-40 hours per week.

Seventy four percent of patients were dialysing at home for longer than 5.5 hours and more than three times a week.

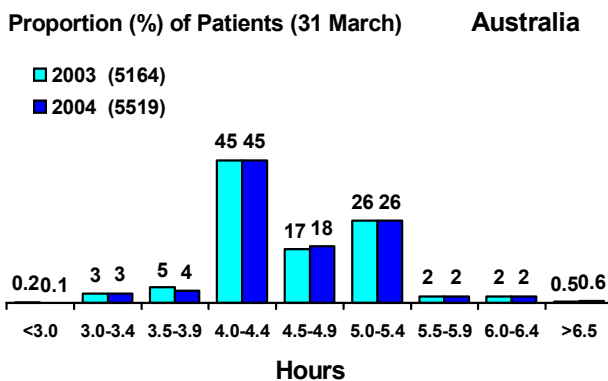
Figure 5.17

**Number of Sessions Per Week
(At 31-Mar) 1999 - 2004**

Sessions per week	1999	2000	2001	2002	2003	2004
Australia						
1	3	7	8	5	5	4
2	78	80	83	76	73	88
2.5	-	-	-	1	-	2
3	3906	4213	4523	4827	5164	5519
3.5	15	14	-	85	101	118
4	20	50	82	84	83	91
5	2	2	8	17	28	41
6	5	8	12	29	45	59
7	-	-	1	4	3	2
Total	4029	4374	4717	5128	5502	5924
New Zealand						
1	-	1	1	-	2	-
2	10	11	12	16	13	11
3	488	555	660	728	794	896
3.5	-	-	-	2	4	10
4	3	8	6	10	10	10
5	-	-	-	2	-	4
6	-	-	-	3	3	6
7	-	-	-	-	-	1
Total	501	575	679	761	826	938

Figure 5.18

**Duration of Dialysis Treatment
Three Sessions Per Week**



**Duration of Dialysis Treatment
Three Sessions Per Week**

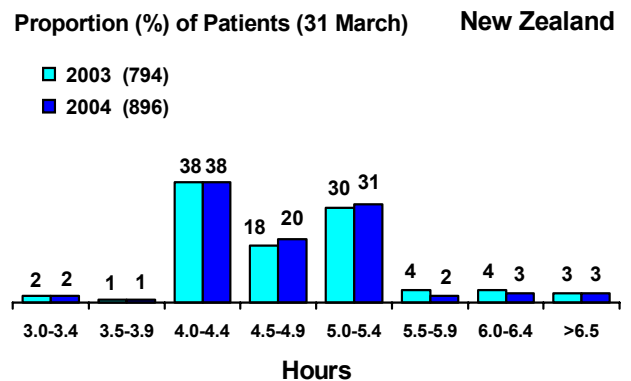




Figure 5.19

Haemodialyser Membrane Types by Surface Area Patients Alive on Haemodialysis at 31-Mar-2004

Dialyser Membrane Type	Flux	Square Metres					Total
		<1.0	1.0-1.4	1.5-1.7	1.8-1.9	>1.9	
Australia							
Cellulose Acetate	Low	0	3	7	0	3	13
Cellulose Triacetate	High	0	1	5	248	0	254
Cuprophane	Mid	0	0	0	3	15	18
Diacetate	Low	0	1	28	0	1	30
Exebrane	High	0	0	21	97	9	127
Exebrane	Mid	0	0	12	10	0	22
Haemophan	Low	0	19	136	11	322	488
Polyamide Haemodiafiltration	High	0	67	42	0	47	156
Polyamix	High	0	7	32	0	15	54
Polyamix	Low	0	216	756	0	0	972
Polysulphone	High	1	129	0	1107	244	1481
Polysulphone	Low	20	137	165	1031	579	1932
Polysulphone-Helixone	High	0	0	0	37	0	37
Polysynthane	Low	0	38	182	0	120	340
Total		21	618	1386	2544	1355	5924
New Zealand							
Cuprophane	Low	0	0	1	0	0	1
Haemophan	Low	0	3	24	0	252	279
Polyamide Hemodiafiltration	High	0	9	7	0	21	37
Polyamix	High	0	0	1	0	1	2
Polyamix	Low	0	20	103	0	0	123
Polycarbonate/Poly/Copolymer	Low	0	0	0	1	0	1
Polysulphone	High	0	6	0	48	0	54
Polysulphone	Low	0	20	1	396	24	441
Total		0	58	137	445	298	938

MEMBRANE TYPE AND SURFACE AREAS

AUSTRALIA

Figures 5.19-5.20.

Usage of low flux polysulfone dialysers decreased to 32% in March 2004 (36% in March 2003 and 42% in March 2002), while use of high flux polysulphone increased to 25% (18% in March 2003 and 13% in March 2002).

Thirty six percent of patients received dialysis with high flux dialysers (27% in March 2003, 24% in March 2002) and <1% of patients received mid flux dialysis. Use of haemophan continues to decrease from 22% in 2002 to 13% in March 2003 and 8% in March 2004.

The trend to larger surface area dialysers continues.

NEW ZEALAND

Figures 5.19-5.20.

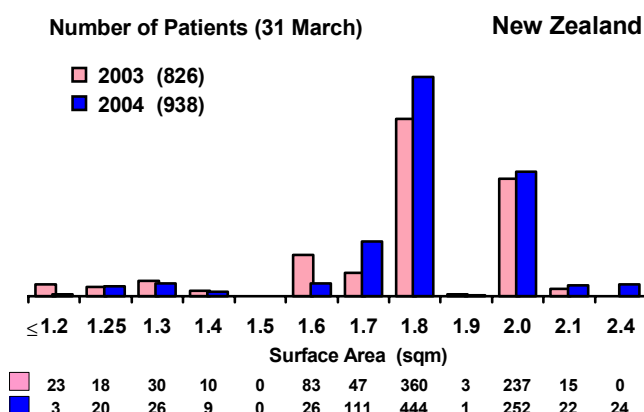
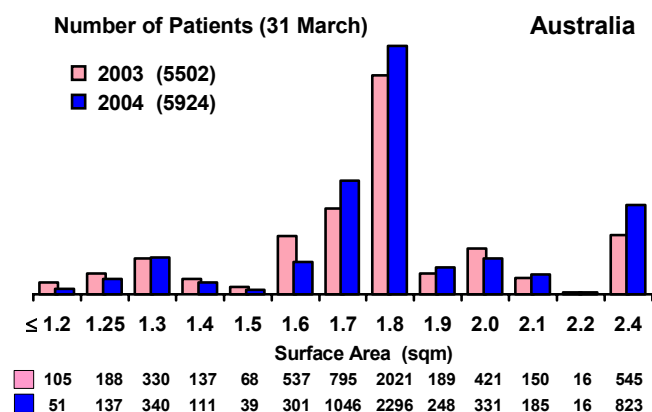
Haemophan decreased from 37% in March 2003 to 30% in March 2004, while low flux polysulphone remained similar to last year (47% in 2004 and 46% in March 2003).

There were 10% (93 patients) reported as receiving high flux dialysis in 2004, an increase from 7% in March 2003.

Figure 5.20

Haemodialysis Surface Area

Haemodialysis Surface Area



CALCIUM AND PHOSPHATE

The March 2004 survey was the first occasion when calcium and phosphate data were collected. Completion rates for this aspect were excellent, particularly for phosphate reporting.

The calcium and phosphate levels reported are tabled in Figures 5.21 and 5.22 and the calcium phosphate products are tabulated in Figure 5.23. They include all patients and dialysis modalities.

In coming surveys, this data will allow examination of associations between calcium/phosphate control and various outcomes.

Figure 5.21

Calcium			
Calcium (mmol/l)	Modality		TOTAL
	HD	PD	
Australia			
<2.0	311 (5%)	111 (6%)	422 (5%)
2.0-2.1	891 (14%)	355 (18%)	1246 (15%)
2.2-2.3	2315 (35%)	686 (34%)	3001 (35%)
2.4-2.5	2045 (31%)	546 (27%)	2591 (30%)
>=2.6	809 (12%)	224 (11%)	1033 (12%)
Missing	176 (3%)	78 (4%)	254 (3%)
Total	6547 (100%)	2000 (100%)	8547 (100%)
New Zealand			
<2.0	32 (3%)	41 (5%)	73 (4%)
2.0-2.1	95 (9%)	157 (18%)	252 (13%)
2.2-2.3	282 (27%)	265 (31%)	547 (29%)
2.4-2.5	443 (43%)	288 (34%)	731 (39%)
>=2.6	161 (16%)	90 (11%)	251 (13%)
Missing	20 (2%)	13 (2%)	33 (2%)
Total	1033 (100%)	854 (100%)	1887 (100%)

Figure 5.22

Phosphate			
Phosphate (mmol/l)	Modality		TOTAL
	HD	PD	
Australia			
<1.4	2311 (35%)	706 (35%)	3017 (35%)
1.4-1.6	821 (13%)	280 (14%)	1101 (13%)
1.6-1.7	1050 (16%)	310 (16%)	1360 (16%)
>=1.8	2258 (34%)	636 (32%)	2894 (34%)
Missing	107 (2%)	68 (3%)	175 (2%)
Total	6547 (100%)	2000 (100%)	8547 (100%)
New Zealand			
<1.4	239 (2%)	274 (32%)	513 (27%)
1.4-1.6	118 (11%)	87 (10%)	205 (11%)
1.6-1.7	154 (15%)	144 (17%)	298 (16%)
>=1.8	500 (48%)	336 (39%)	836 (44%)
Missing	22 (2%)	13 (2%)	35 (2%)
Total	1033 (100%)	854 (100%)	1887 (100%)

Figure 5.23

Calcium / Phosphate			
Calcium Phosphate Product	Modality		TOTAL
	HD	PD	
Australia			
<3.5	2633 (40%)	824 (41%)	3457 (40%)
3.5-3.9	961 (15%)	349 (17%)	1310 (15%)
4.0-4.4	813 (12%)	216 (11%)	1029 (12%)
4.5-4.9	649 (10%)	206 (10%)	855 (10%)
>=5.0	1308 (20%)	323 (16%)	1631 (19%)
Missing	183 (3%)	82 (4%)	265 (3%)
Total	6547 (100%)	2000 (100%)	8547 (100%)
New Zealand			
<3.5	276 (27%)	312 (37%)	588 (31%)
3.5-3.9	130 (13%)	127 (15%)	257 (14%)
4.0-4.4	136 (13)	111 (13%)	247 (13%)
4.5-4.9	114 (11%)	92 (11%)	206 (11%)
>=5.0	357 (35%)	199 (23%)	556 (29%)
Missing	20 (2%)	13 (2%)	33 (2%)
Total	1033 (100%)	854 (100%)	1887 (100%)



Figure 5.24

**Duration of Treatments and Serum Phosphate Levels
Haemodialysis - Three Sessions Per Week
March 2004**

Hours per Session	Australia			New Zealand		
	<1.8 mmol/L	1.8-2.2 mmol/L	>2.2 mmol/L	<1.8 mmol/L	1.8-2.2 mmol/L	>2.2 mmol/L
<3.5	89 (3%)	36 (3%)	24 (2%)	10 (2%)	1 (<1%)	3 (1%)
3.5 - 3.9	163 (5%)	37 (3%)	33 (4%)	4 (1%)	8 (3%)	-
4.0 - 4.4	1599 (46%)	513 (43%)	374 (43%)	171 (41%)	82 (34%)	87 (38%)
4.5 - 4.9	614 (18%)	207 (18%)	173 (20%)	93 (22%)	48 (20%)	39 (17%)
>=5	979 (28%)	392 (33%)	269 (31%)	140 (33%)	105 (43%)	103 (44%)
Total	3444 (100%)	1185 (100%)	873(100%)	418 (100%)	244 (100%)	232 (100%)

In Figure 5.25, the calcium, phosphate and CaP product is tabulated according to the standards suggested by the CARI guidelines (<http://www.kidney.org.au/cari/drafts/cbiochem.html>). For each parameter, the frequencies differ significantly between Australia and New Zealand ($p<0.001$).

Figure 5.25

**Percentage of Patients in Each CARI Guideline Category
Dialysing Three Times a Week
1-Oct-2003 to 31-Mar-2004**

		Australia	New Zealand	TOTAL
Calcium [mmol/l] CARI	0 - 2.1	1136 (19%)	122 (12%)	1258 (18%)
	2.2 - 2.5	4051 (66%)	686 (70%)	4737 (67%)
	>=2.6	744 (12%)	153 (16%)	897 (13%)
	Missing	164 (3%)	18 (2%)	182 (2%)
	Total	6095 (100%)	979 (100%)	7074 (100%)
		Pearson chi2 (3) = 29.9022 Pr = 0.000		
Phosphate [mmol/l] (%) CARI	0 - 1.7	3885 (64%)	482 (49%)	4367 (62%)
	1.8 - 2.1	1104 (18%)	231 (24%)	1335 (19%)
	>= 2.2	1021 (17%)	248 (25%)	1269 (18%)
	Missing	85 (1%)	18 (2%)	103 (1%)
	Total	6095 (100%)	979 (100%)	7074 (100%)
		Pearson chi2 (3) = 77.9512 Pr = 0.000		
Calcium x Phosphate Product (%)	0 - 4.1	3681 (60%)	437 (45%)	4118 (58%)
	4.2 - 5.7	1638 (27%)	354 (36%)	1992 (28%)
	>= 5.8	605 (10%)	170 (17%)	775 (11%)
	Missing	171 (3%)	18 (2%)	189 (3%)
	Total	6095 (100%)	979 (100%)	7074 (100%)
		Pearson chi2 (3) = 107.3506 Pr = 0.000		

UREA REDUCTION RATIO

The data return in this section is one of the poorest in the Registry. Overall, data has not been reported on 11% of Australian patients and 20% of New Zealand patients at 31st March 2004.

commensurate with that recommended by the CARI guidelines (URR \geq 65%) at 31-Mar-04.

URR is lower in patients dialysing using catheters than in those using fistulae or grafts (fig 5.27).

Figure 5.26 shows that 88% in Australia and 65% of patients in New Zealand receive a dialysis dose

Figure 5.26

Urea Reduction Ratio (URR) of Patients Alive on Haemodialysis At 30-Sep-2002 and 31-Mar-2004								
Reported URR	Australia				New Zealand			
	30-Sep-02	31-Mar-03	30-Sep-03	31-Mar-04	30-Sep-02	31-Mar-03	30-Sep-03	31-Mar-04
00-39%	<1%	<1%	<1%	<1%	<1%	<1%	1%	<1%
40-49%	<1%	<1%	1%	1%	3%	3%	4%	2%
50-59%	4%	4%	4%	4%	19%	15%	18%	15%
60-64%	9%	9%	8%	8%	18%	22%	19%	18%
65-69%	19%	19%	20%	18%	24%	22%	18%	23%
70-74%	27%	27%	29%	29%	18%	18%	21%	20%
75-79%	22%	23%	22%	23%	10%	11%	12%	12%
80-100%	18%	17%	16%	17%	8%	8%	7%	10%
Total Pts	4309	4512	4626	4924	589	597	666	714
Median	73	73	72	73	67	68	67	68
25th Percentile	68	68	68	68	61	61	60	62
75th Percentile	78	77	77	77	73	73	73	74

Figure 5.27

Urea Reduction Ratio and Type of Access Haemodialysis - Three Sessions Per Week March 2004								
URR	Australia				New Zealand			
	Native	Grafts	Catheters	Total	Native	Grafts	Catheters	Total
<60	152 (4%)	16 (1%)	61 (11%)	229 (4%)	71 (12%)	7 (7%)	46 (20%)	124 (14%)
60-64	283 (7%)	40 (4%)	61 (11%)	384 (7%)	87 (15%)	11 (12%)	32 (14%)	130 (15%)
65-69	709 (17%)	104 (12%)	83 (15%)	896 (16%)	98 (17%)	23 (26%)	43 (19%)	164 (18%)
70-74	1142 (28%)	193 (22%)	98 (18%)	1433 (26%)	101 (17%)	13 (15%)	28 (12%)	142 (16%)
\geq 75	1415 (35%)	431 (49%)	136 (25%)	1982 (36%)	94 (16%)	21 (23%)	39 (17%)	154 (17%)
Unknown	376 (9%)	104 (12%)	115 (21%)	595 (11%)	130 (22%)	14 (16%)	38 (17%)	182 (20%)
Total	4077 (100%)	888 (100%)	544 (100%)	5519 (100%)	581 (100%)	89 (100%)	226 (100%)	896 (100%)

ACCESS AT FIRST TREATMENT

Data collection for access used at first haemodialysis commenced from 1st October 2003.

As well as patients having their first treatment on haemodialysis, data collected also includes patients previously having peritoneal dialysis and changing to haemodialysis, and patients returning to dialysis after graft failure where haemodialysis was given for the first time.

Here, we have only presented data for those whose first treatment was haemodialysis.

The use of catheters is similar between Australia and New Zealand for incident patients (fig 5.28), although lower in Australia for prevalent dialysis.

Access type for both incident and prevalent dialysis patients is variable among Australian States (fig 5.29).

Figure 5.28

**First Access
Haemodialysis as Initial Modality
1-Oct-03 to 31-Mar-2004**

First Access	Country		TOTAL
	Australia	New Zealand	
Native	256 (39%)	42 (35%)	298 (38%)
Synthetic	18 (3%)	2 (2%)	20 (3%)
Tunnel CV	247 (37%)	31 (26%)	278 (36%)
Non Tunnel CV	140 (21%)	44 (38%)	184 (24%)
Total	661 (100%)	119 (100%)	780 (100%)

Figure 5.29 **Australian States**

**First Access
Haemodialysis as Initial Modality
1-Oct-03 to 31-Mar-2004**

First Access	QLD	NSW	ACT	VIC	TAS	SA	NT	WA	TOTAL
Native	47 (38%)	56 (28%)	1 (10%)	85 (49%)	-	35 (56%)	12 (48%)	20 (3%)	256 (39%)
Synthetic	7 (6%)	8 (4%)	1 (10%)	1 (<1%)	-	1 (2%)	-	-	18 (3%)
Tunnel CV	49 (40%)	70 (35%)	8 (80%)	64 (37%)	3 (75%)	14 (23%)	11 (44%)	28 (45%)	247 (37%)
Non Tunnel CV	21 (17%)	66 (33%)	-	24 (13%)	1 (25%)	12 (20%)	2 (8%)	14 (23%)	140 (21%)
Total	124 (100%)	200 (100%)	10 (100%)	174 (100%)	4 (100%)	62 (100%)	25 (100%)	62 (100%)	661 (100%)

A graph of this Table is also available to download from the PowerPoint slides at www.anzdata.org.au

Access in use at first dialysis did not vary with age among diabetics in Australia or New Zealand.

In Australia (but not New Zealand), there was significant variation with higher rates of native fistulae seen among those aged 25-75 years at dialysis start ($p=0.04$).

Figure 5.30

**Age at First Treatment
Access in use where first Treatment was Haemodialysis
1-Oct-2003 to 31-Mar-2004**

Related to Disease	Age Groups						Total
	00-24	25-54	55-64	65-74	75-84	>=85	
Australia							
Diabetic Patients							
Native	-	25	21	17	5	-	68
Synthetic	-	1	3	2	-	-	6
Tunnel CV Catheter	-	27	15	17	6	-	65
Non Tunnel CV Catheter	-	11	12	11	3	-	37
Sub TOTAL	-	64	51	47	14	-	176
Non Diabetic Patients							
Native	3	64	35	47	36	3	188
Synthetic	-	7	2	1	2	-	12
Tunnel CV Catheter	9	46	34	36	50	7	182
Non Tunnel CV Catheter	7	25	13	34	22	2	103
Sub TOTAL	19	142	84	118	110	12	485
TOTAL	19	206	135	165	124	12	661
($p=0.04$)							
New Zealand							
Diabetic Patients							
Native	-	5	6	2	1	-	14
Synthetic	-	-	-	1	-	-	1
Tunnel CV Catheter	-	6	1	3	1	-	11
Non Tunnel CV Catheter	-	5	5	6	-	-	16
Sub TOTAL	-	16	12	12	2	-	42
Non Diabetic Patients							
Native	1	12	10	3	2	-	28
Synthetic	-	-	-	-	1	-	1
Tunnel CV Catheter	-	9	3	5	3	-	20
Non Tunnel CV Catheter	2	9	5	6	6	-	28
Sub TOTAL	3	30	18	14	12	-	77
TOTAL	3	46	30	26	14	-	119



ACCESS IN USE AT 31ST MARCH 2004

Figure 5.31

Percentage Synthetic Fistulae/Grafts March 2004 Number of Patients (% Patients)			
	No. of Pts.	Diabetic	Non Diabetic
Queensland	1002	232 (14%)	770 (13%)
New South Wales	1839	292 (26%)	1547 (24%)
Aust. Capital Territory	130	19 (37%)	111 (46%)
Victoria	1615	324 (10%)	1291 (10%)
Tasmania	118	25 (8%)	93 (5%)
South Australia	409	79 (11%)	330 (12%)
Northern Territory	215	105 (3%)	110 (2%)
Western Australia	596	168 (7%)	428 (13%)
Australia	5924	1244 (14%)	4680 (16%)
<i>March 2003</i>	<i>(5502)</i>	<i>1092 (15%)</i>	<i>4410 (17%)</i>
New Zealand	938	356 (10%)	582 (10%)
<i>March 2003</i>	<i>(826)</i>	<i>277 (14%)</i>	<i>549 (13%)</i>

Figures 5.31 to 5.34 describe the data about prevalent haemodialysis access (i.e. access in use at 31st March 2004). These patterns are similar to previous: overall native fistulas predominate. The proportion with central catheters are substantially higher in New Zealand.

Figure 5.33

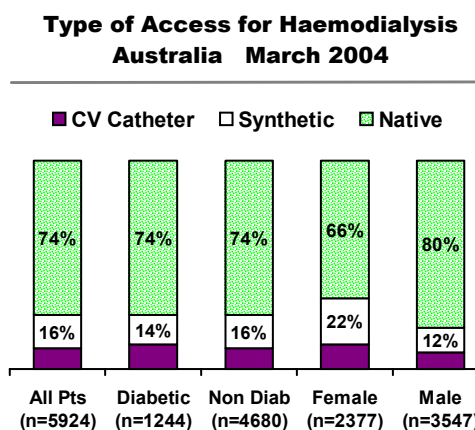


Figure 5.32

Percentage of Non Native Access March 2004 n = Number of Patients				
	Australia (n=5924)		New Zealand (n=938)	
	Grafts	Catheters	Grafts	Catheters
Total HD Population	16%	10%	10%	25%
Diabetics	14%	12%	10%	30%
Female	22%	12%	15%	30%

**Type of Access for Haemodialysis
New Zealand March 2004**

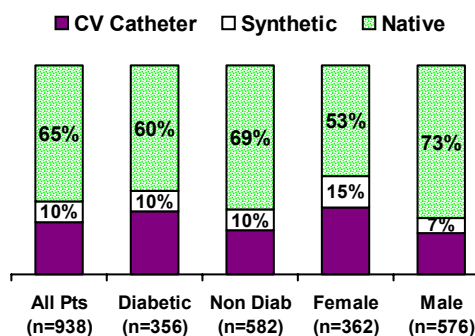


Figure 5.34

Access Intervention in Previous Six Months March 2004 n = Number of Patients							
	n	Revision of Access			Declotting of Access		
		Native	Grafts	Catheters	Native	Grafts	Catheters
Australia	n=5924	8%	25%	18%	4%	20%	21%
Diabetics	n=1244	10%	31%	18%	5%	20%	18%
Female	n=2377	10%	23%	21%	4%	18%	21%
New Zealand	n=938	10%	30%	7%	4%	16%	10%

PATIENT BODY MASS INDEX

There has been considerable interest in BMI in recent years and the Registry has received several requests for information.

There has been a gradual increase in the BMI of those commencing dialysis, shown in Figure 5.36.

The graph in Figure 5.35 illustrates similar information in a box plot, showing 25th, 50th and 75th centiles together with the “adjacent values” (which approximate 95th centiles).

Figure 5.35

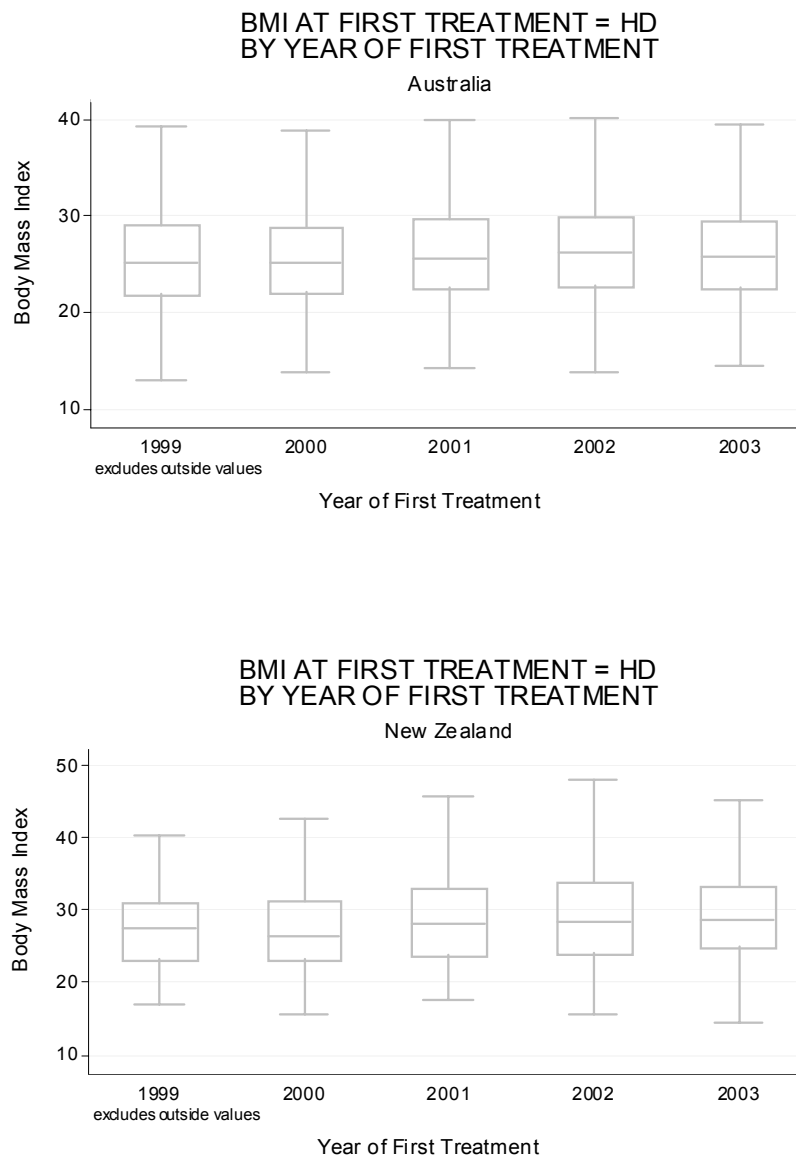




Figure 5.36

Patient Body Mass Index at First Treatment 1999 - 2003						
Year	BMI	Age Groups				Total
		20-34	35-54	55-74	>=75	
Australia						
1999	<20	25 (21%)	36 (10%)	63 (10%)	25 (15%)	149 (12%)
	20-24.9	62 (51%)	128 (34%)	225 (36%)	71 (43%)	486 (38%)
	25-29.9	24 (20%)	126 (33%)	193 (31%)	53 (32%)	396 (31%)
	>=30	9 (7%)	87 (23%)	137 (22%)	15 (9%)	248 (19%)
	Total	120 (100%)	377 (100%)	618 (100%)	164 (100%)	1279 (100%)
2000	<20	11 (9%)	43 (12%)	62 (11%)	26 (12%)	142 (11%)
	20-24.9	68 (57%)	113 (32%)	191 (33%)	91 (43%)	463 (37%)
	25-29.9	29 (24%)	100 (29%)	207 (35%)	66 (31%)	402 (32%)
	>=30	11 (9%)	91 (26%)	125 (21%)	26 (12%)	253 (20%)
	Total	199 (100%)	347 (100%)	585 (100%)	209 (100%)	1260 (100%)
2001	<20	15 (13%)	36 (9%)	55 (9%)	32 (14%)	138 (10%)
	20-24.9	47 (42%)	132 (34%)	213 (34%)	93 (40%)	485 (36%)
	25-29.9	28 (25%)	119 (31%)	196 (31%)	70 (30%)	413 (30%)
	>=30	22 (20%)	97 (25%)	164 (26%)	36 (16%)	319 (24%)
	Total	112 (100%)	384 (100%)	628 (100%)	231 (100%)	1355 (100%)
2002	<20	13 (13%)	34 (10%)	36 (6%)	38 (15%)	121 (9%)
	20-24.9	46 (46%)	103 (29%)	171 (28%)	94 (37%)	414 (31%)
	25-29.9	22 (22%)	125 (35%)	231 (38%)	92 (36%)	470 (35%)
	>=30	18 (18%)	94 (26%)	176 (29%)	31 (12%)	319 (24%)
	Total	99 (100%)	356 (100%)	614 (100%)	255 (100%)	1324 (100%)
2003	<20	17 (17%)	38 (10%)	50 (8%)	27 (9%)	132 (10%)
	20-24.9	38 (38%)	118 (31%)	193 (31%)	132 (44%)	481 (35%)
	25-29.9	24 (24%)	118 (31%)	213 (35%)	105 (35%)	460 (33%)
	>=30	19 (19%)	103 (27%)	158 (26%)	37 (12%)	317 (23%)
	Total	98 (100%)	377 (100%)	614 (100%)	301 (100%)	1390 (100%)
New Zealand						
1999	<20	7 (32%)	3 (5%)	5 (6%)	3 (15%)	18 (10%)
	20-24.9	6 (27%)	14 (23%)	20 (24%)	8 (40%)	48 (26%)
	25-29.9	6 (27%)	24 (39%)	24 (29%)	5 (25%)	59 (32%)
	>=30	3 (14%)	19 (31%)	32 (39%)	3 (15%)	57 (31%)
	Total	22 (100%)	60 (100%)	81 (100%)	19 (100%)	182 (100%)
2000	<20	2 (6%)	5 (6%)	10 (8%)	3 (18%)	20 (8%)
	20-24.9	21 (60%)	25 (29%)	34 (27%)	4 (24%)	84 (32%)
	25-29.9	5 (14%)	23 (27%)	38 (30%)	10 (59%)	76 (29%)
	>=30	7 (20%)	32 (37%)	41 (33%)	0 (0%)	80 (30%)
	Total	35 (100%)	85 (100%)	123 (100%)	17 (100%)	260 (100%)
2001	<20	2 (10%)	5 (5%)	5 (4%)	3 (16%)	15 (6%)
	20-24.9	9 (45%)	16 (16%)	47 (35)	10 (53%)	82 (30%)
	25-29.9	3 (15%)	28 (28%)	30 (22%)	3 (16%)	64 (24%)
	>=30	6 (30%)	48 (49%)	51 (38%)	3 (16%)	108 (40%)
	Total	20 (100%)	97 (100%)	133 (100%)	19 (100%)	269 (100%)
2002	<20	2 (19%)	4 (4%)	10 (7%)	2 (13%)	18 (6%)
	20-24.9	7 (41%)	23 (24%)	35 (23%)	9 (60%)	74 (26%)
	25-29.9	3 (18%)	27 (28%)	44 (29%)	1 (7%)	75 (27%)
	>=30	5 (29%)	41 (43%)	64 (42%)	3 (20%)	113 (40%)
	Total	17 (100%)	95 (100%)	153 (100%)	15 (100%)	280 (100%)
2003	<20	2 (9%)	2 (2%)	6 (4%)	4 (14%)	14 (5%)
	20-24.9	7 (32%)	17 (21%)	29 (20%)	7 (24%)	60 (22%)
	25-29.9	7 (32%)	35 (42%)	45 (31%)	8 (28%)	95 (34%)
	>=30	6 (27%)	29 (35%)	65 (45%)	10 (35%)	110 (39%)
	Total	22 (100%)	83 (100%)	145 (100%)	29 (100%)	279 (100%)