CHAPTER 6

PERITONEAL DIALYSIS

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STOCK AND FLOW

AUSTRALIA

In 2004, continuous ambulatory peritoneal dialysis was used to treat 13% of all dialysis patients (14% in 2003), and automated peritoneal dialysis 9%, the same as 2003. Together, these accounted for 69% of all home dialysis, a figure which has been stable for the past number of years (fig 6.1). Of the 18,217 patients, 4% had experienced at least five years of continuous peritoneal dialysis (fig 6.2).

The proportion of all home dialysis patients on peritoneal dialysis in each State ranged from 59% (New South Wales), to 87% (South Australia and Northern Territory) (fig 6.1).

The prevalence of automated peritoneal dialysis increased only 2% in 2004 (746 patients) after a 19% increase in 2003 (733 patients from 617 patients in 2002).

In relation to age, the proportion of all dialysis patients (65-74 years and 75-84 years) using peritoneal dialysis was 26% and 21% (27% and 23% respectively in 2003); range 13% (>= 85 years) to 80% (0-14 years) (fig 6.9).

The annual stock and flow of patients during the period 2000-2004 is shown in Figures 6.3 and 6.4.

There were 734 new peritoneal dialysis patients in the calendar year 2004, a decrease of 9% from 2003, compared to an increase of 3% from 2002 to 2003. There were 434 (59%) who started RRT with peritoneal dialysis, (23% of all new dialysis patients in 2004) and 300 (41%) who previously had haemodialysis or a failed transplant (fig 6.3).

New patients over the age of 65 years decreased 13%, from 357 to 310 in 2004. There were also decreases in 2003 of 2% and 2002 of 3% in this age group.

There was a 35% decrease in the 25-34 year age group, after a very large increase in 2003. There were decreases in most age groups, 0-14 years (25%), 15-24 years (10%), 35-44 years (13%), 55-64 years (3%), 65-74 years (7%) and 75-84 years (26%). There were increases in only two groups, 45-54 years (12%) and >=85 year group (60% from five to eight patients).

There were 287 deaths (289 in 2003), (16.0 deaths per 100 patient years (fig 3.8). For more detail see Appendix II at Website (www.anzdata.org.au/ANZDATA/AnzdataReport/download.htm).

One hundred and fifty one patients received a transplant in 2004 compared to 112 in 2003; 8% of all patients treated, 15% of patients <65 years treated during the year (fig 6.3). Eight patients >=65 years were transplanted.

Permanent transfer (>12 months) to haemodialysis was 391 (22%) and 357 (19%) in 2003. Most transfers to haemodialysis were permanent (391/494) (fig 6.3).

The primary renal disease of new patients to peritoneal dialysis saw an 11% increase in 2004 of those diagnosed with diabetic nephropathy; this group comprised 31% of all new peritoneal dialysis patients compared to 26% in 2003. There was a 14% decrease in glomerulonephritis from 2003 (233 to 201 patients, 27% of all new peritoneal dialysis patients (fig 6.8)).

Figure 6.1

Proportion (%) Peritoneal Dialysis of all Home Patients 2000 - 2004

State	2000	2001	2002	2003	2004
Queensland	84%	84%	82%	80%	77%
New South Wales	58%	59%	59%	60%	59%
ACT	75%	67%	74%	71%	76%
Victoria	72%	73%	73%	72%	71%
Tasmania	88%	80%	79%	87%	79%
South Australia	83%	83%	80%	90%	87%
Northern Territory	100%	96%	97%	97%	87%
Western Australia	90%	88%	87%	87%	86%
Australia	**70%**	**70%**	**69%**	**70%**	**69%**
New Zealand	**78%**	**78%**	**77%**	**76%**	**75%**

Figure 6.2

Continuous Period of Peritoneal Dialysis 2004

	Months													
	0-6	7-12	13-18	19-24	25-30	31-36	37-42	43-48	49-60	61-72	73-84	85-96	97-108	>=109
Australia														
1st Treatment 14,848 Pts	4155	2837	2026	1537	1195	805	626	453	578	333	152	79	41	31
All Treatments 18,217 Pts	5415	3507	2444	1851	1394	946	731	527	664	387	170	90	47	44
New Zealand														
1st Treatment 4,223 Pts	838	657	557	489	396	328	272	170	253	118	52	46	21	26
All Treatments 4,986 Pts	1049	802	668	558	460	371	308	188	280	132	64	49	23	34

Figure 6.3

Stock and Flow of Peritoneal Dialysis Patients
2000 - 2004

State	2000	2001	2002	2003	2004
Australia					
Patients new to PD	785	829	785	808	734
First Dialysis Treatment	426	483	494	492	434
Previous Dialysis (HD)	339	335	275	293	285
Failed Transplant	20	11	16	23	15
Transplanted	122	110	141	112	151
Deaths	289	312	334	289	287
Never Transplanted	280	301	325	278	273
Previous Transplant	9	11	9	11	14
Permanent Transfers Out (>12 months)	350	358	356	357	391
Temporary Transfers (12 months)	124	125	90	87	103
Patients Dialysing (PD) at 31 December	1737	1807	1790	1840	1778
Patients Dialysing (PD) at Home 31 December	1703	1766	1749	1812	1757
% of all Home Dialysis Patients	70%	70%	69%	70%	69%
New Zealand					
Patients new to PD	263	281	292	260	273
First Dialysis Treatment	142	180	162	153	169
Previous Dialysis (HD)	114	94	124	102	99
Failed Transplant	7	7	6	5	5
Transplanted	41	37	43	37	39
Deaths	139	135	123	131	152
Never Transplanted	138	132	115	125	146
Previous Transplant	1	3	8	6	6
Permanent Transfers Out (>12 months)	86	77	68	100	121
Temporary Transfers (<12 months)	65	35	32	33	29
Patients Dialysing (PD) at 31 December	681	715	770	768	742
Patients Dialysing (PD) at Home 31 December	677	707	764	765	739
% of all Home Dialysis Patients	78%	78%	77%	76%	75%

Figure 6.4

Stock and Flow of Peritoneal Dialysis Patients
Australia 2000 - 2004

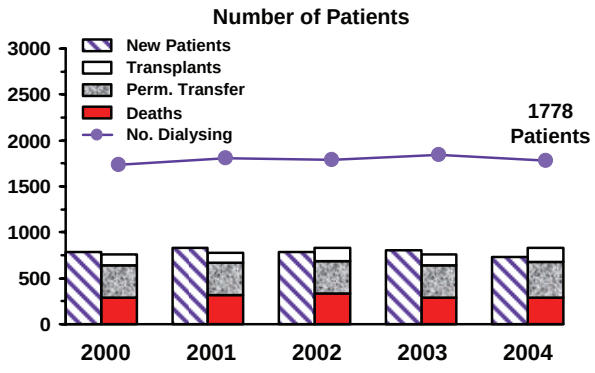


Figure 6.5

Stock and Flow of Peritoneal Dialysis Patients
New Zealand 2000 - 2004

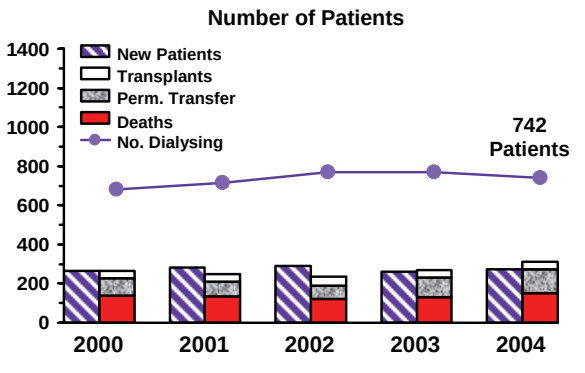
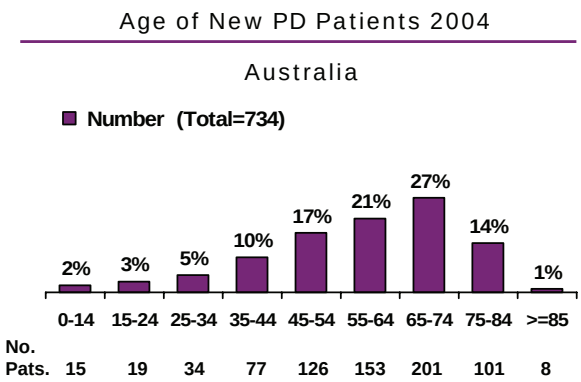


Figure 6.6



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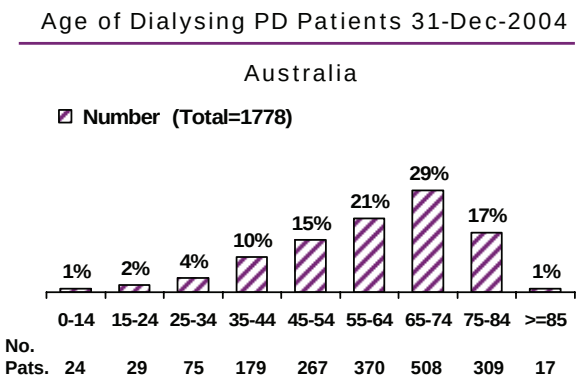


Figure 6.8 AUSTRALIA

Stock and Flow of Peritoneal Dialysis by Age Groups 2000 - 2004

Age Groups	2000	2001	2002	2003	2004
New Patients *					
00-14 years	15 (2%)	13 (2%)	17 (2%)	20 (2%)	15 (2%)
15-24 years	26 (3%)	18 (2%)	18 (2%)	21 (3%)	19 (3%)
25-34 years	60 (8%)	43 (5%)	24 (3%)	52 (6%)	34 (5%)
35-44 years	67 (8%)	81 (10%)	81 (10%)	88 (11%)	77 (10%)
45-54 years	121 (15%)	116 (14%)	127 (16%)	113 (14%)	126 (17%)
55-64 years	177 (23%)	183 (22%)	153 (20%)	157 (19%)	153 (21%)
65-74 years	210 (27%)	234 (28%)	232 (30%)	216 (27%)	201 (27%)
75-84 years	103 (13%)	136 (17%)	127 (16%)	136 (17%)	101 (14%)
>=85 years	6 (1%)	5 (<1%)	6 (1%)	5 (1%)	8 (1%)
Total	**785 (100%)**	**829 (100%)**	**785 (100%)**	**808 (100%)**	**734 (100%)**
Patients Dialysing					
00-14 years	25 (1%)	22 (1%)	23 (1%)	25 (1%)	24 (1%)
15-24 years	51 (3%)	42 (2%)	43 (3%)	36 (2%)	29 (2%)
25-34 years	114 (7%)	106 (6%)	82 (5%)	93 (5%)	75 (4%)
35-44 years	150 (9%)	182 (10%)	182 (10%)	186 (10%)	179 (10%)
45-54 years	283 (16%)	257 (14%)	260 (14%)	270 (15%)	267 (15%)
55-64 years	355 (20%)	383 (21%)	363 (20%)	370 (20%)	370 (21%)
65-74 years	511 (30%)	521 (29%)	529 (30%)	528 (29%)	508 (29%)
75-84 years	236 (14%)	282 (16%)	290 (16%)	318 (17%)	309 (17%)
>=85 years	12 (<1%)	12 (<1%)	18 (1%)	14 (<1%)	17 (1%)
Total	**1737 (100%)**	**1807 (100%)**	**1790 (100%)**	**1840 (100%)**	**1778 (100%)**
Primary Renal Disease *					
Glomerulonephritis	219 (28%)	212 (26%)	228 (29%)	233 (29%)	201 (27%)
Analgesic Nephropathy	54 (7%)	50 (6%)	36 (5%)	34 (4%)	18 (3%)
Hypertension	103 (13%)	123 (15%)	120 (15%)	126 (16%)	107 (15%)
Polycystic Disease	42 (5%)	26 (3%)	44 (6%)	42 (5%)	45 (6%)
Reflux Nephropathy	40 (5%)	26 (3%)	24 (3%)	30 (4%)	18 (3%)
Diabetic Nephropathy	205 (26%)	242 (29%)	208 (26%)	208 (26%)	230 (31%)
Miscellaneous	69 (9%)	89 (11%)	72 (9%)	78 (9%)	77 (10%)
Uncertain	53 (7%)	61 (7%)	53 (7%)	57 (7%)	38 (5%)
Total	**785 (100%)**	**829 (100%)**	**785 (100%)**	**808 (100%)**	**734 (100%)**

* New patients receiving first peritoneal dialysis treatment

Figure 6.9

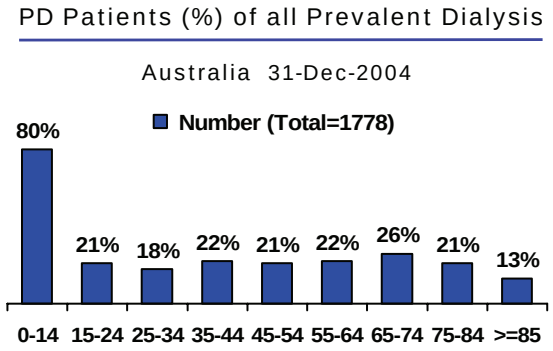
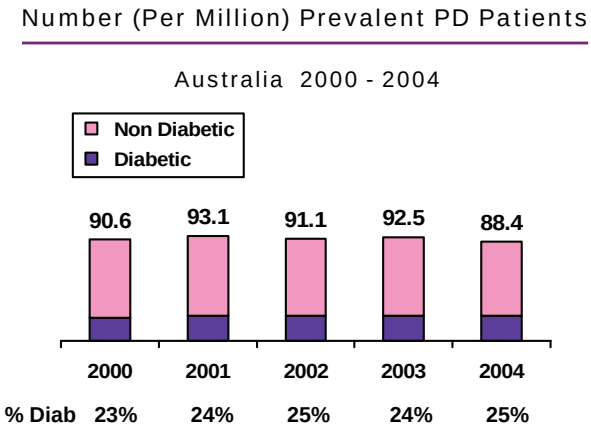


Figure 6.10



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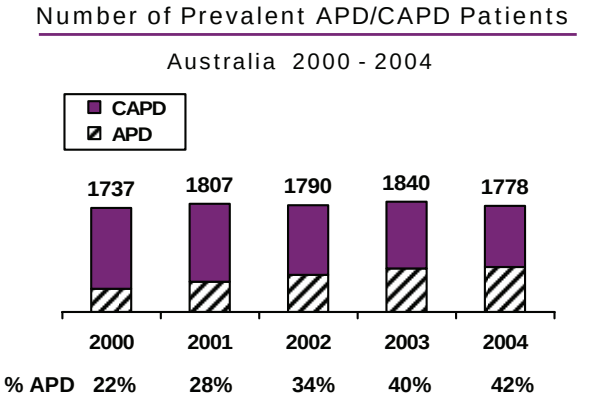

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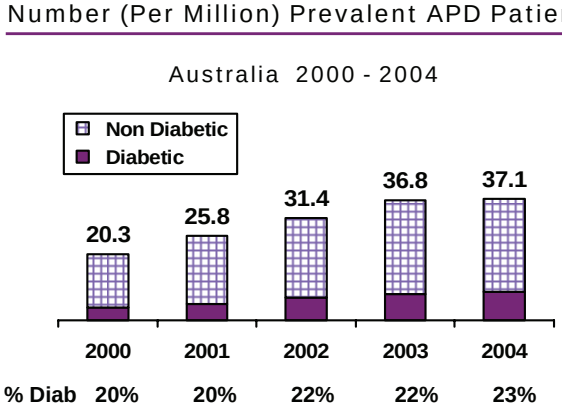

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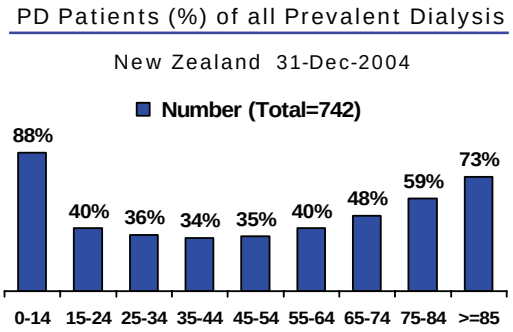

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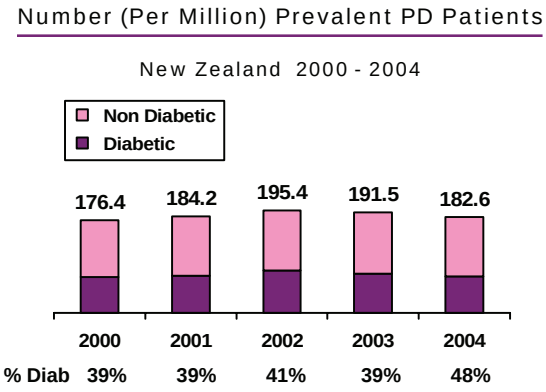

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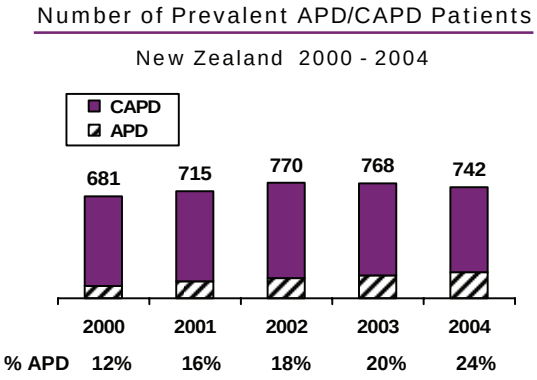

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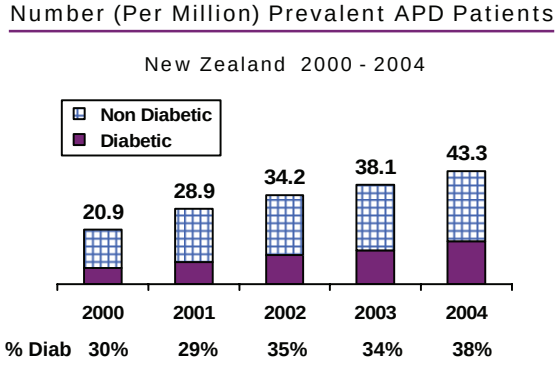


NEW ZEALAND

The annual stock and flow of patients during the period 2000 to 2004 is shown in Figures 6.3 and 6.5. Of the 4,986 patients treated since 1978, 792 (15%) were alive at 31st December 2004, 302 (6%) had more than five years continuous treatment (fig 6.1).

Peritoneal dialysis accounted for 42% of all dialysis patients, and 75% of all patients dialysing at home. Twenty four percent of all peritoneal dialysis in 2004 was automated compared with 20% in 2003, and 18% in 2002.

The age distribution of prevalent peritoneal dialysis patients is shown in Figures 6.18 and 6.19.

There were 273 new peritoneal dialysis patients in the calendar year 2004, an increase of 5% from 2003 (260 patients). For 62%, peritoneal dialysis was the initial dialysis treatment (fig 6.17 and 6.19). For more detail see Appendix III at Website (www.anzdata.org.au/ANZDATA/AnzdataReport/download.htm).

There were 152 deaths amongst prevalent peritoneal dialysis patients in 2004 (131 in 2003) 20.0 deaths per 100 patient years, (14.3% of patients at risk; 3.9% 25-44 years, 11.1% 45-64 years, 17.6% 65-84 years) (fig 3.10). For more detail see Appendix III at Website (www.anzdata.org.au/ANZDATA/AnzdataReport/download.htm).

Thirty nine patients were transplanted in 2004 (37 in 2003), 5% of patients dialysed, 8% of patients <65 years treated during the year (fig 6.2). Three patients >=65 years were transplanted.

The most common primary renal disease of new patients to peritoneal dialysis was diabetic nephropathy (38%) followed by glomerulonephritis (20%). Hypertension accounted for 19% of all new patients, a rise of 77% (53 patients from 30 patients in 2003).

The proportion of patients in each group treated with peritoneal dialysis ranged from 34% (35-44 years), 35% (45-54 years) to 73% (>=85 years) and 88% (0-14 years) (fig 6.13).

Figure 6.17

Age of New PD Patients 2004

New Zealand

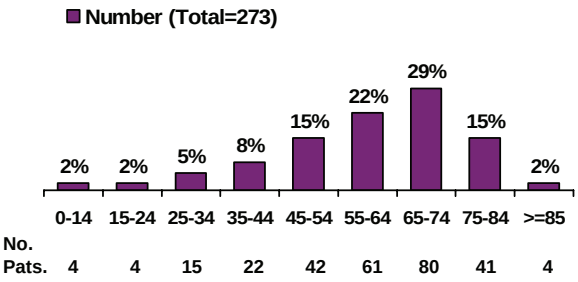


Figure 6.18

Age of Dialysing PD Patients

New Zealand 31-Dec-2004

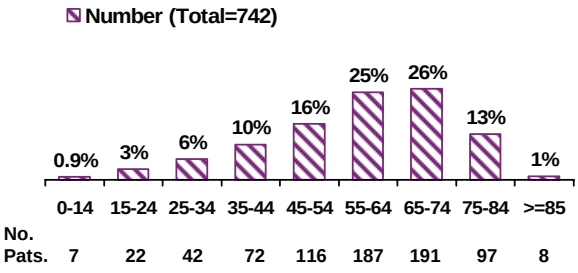


Figure 6.19 NEW ZEALAND

Stock and Flow of Peritoneal Dialysis by Age Groups 2000 - 2004

Age Groups	2000	2001	2002	2003	2004
New Patients *					
00-14 years	6 (2%)	6 (2%)	9 (3%)	7 (3%)	4 (2%)
15-24 years	4 (1%)	12 (4%)	5 (2%)	11 (4%)	4 (2%)
25-34 years	13 (15%)	16 (5%)	23 (8%)	10 (4%)	15 (5%)
35-44 years	24 (9%)	30 (10%)	26 (9%)	26 (10%)	22 (8%)
45-54 years	49 (19%)	49 (17%)	61 (21%)	45 (17%)	42 (15%)
55-64 years	81 (31%)	72 (26%)	76 (26%)	68 (26%)	61 (22%)
65-74 years	56 (22%)	70 (26%)	69 (24%)	67 (26%)	80 (29%)
75-84 years	29 (11%)	24 (9%)	21 (7%)	23 (9%)	41 (15%)
>=85 years	1 (<1%)	2 (1%)	2 (<1%)	3 (1%)	4 (2%)
Total	**263 (100%)**	**281 (100%)**	**292 (100%)**	**260 (100%)**	**273 (100%)**
Patients Dialysing					
00-14 years	6 (1%)	10 (2%)	12 (2%)	7 (1%)	7 (<1%)
15-24 years	18 (2%)	25 (3%)	25 (3%)	29 (4%)	22 (3%)
25-34 years	38 (6%)	42 (6%)	50 (6%)	46 (6%)	42 (6%)
35-44 years	66 (10%)	66 (9%)	74 (10%)	70 (9%)	72 (10%)
45-54 years	135 (20%)	131 (18%)	130 (17%)	133 (17%)	116 (16%)
55-64 years	203 (30%)	200 (28%)	221 (29%)	208 (27%)	187 (25%)
65-74 years	155 (23%)	169 (24%)	178 (23%)	185 (24%)	191 (26%)
75-84 years	56 (8%)	65 (9%)	71 (9%)	83 (11%)	97 (13%)
>=85 years	4 (<1%)	7 (1%)	9 (1%)	7 (1%)	8 (1%)
Total	**681 (100%)**	**715 (100%)**	**770 (100%)**	**768 (100%)**	**742 (100%)**
Primary Renal Disease *					
Glomerulonephritis	60 (23%)	74 (26%)	72 (25%)	64 (25%)	55 (20%)
Analgesic Nephropathy	-	-	2 (<1%)	0 (0%)	1 (<1%)
Hypertension	39 (15%)	39 (14%)	19 (7%)	30 (12%)	53 (19%)
Polycystic Disease	5 (2%)	14 (5%)	10 (3%)	9 (3%)	11 (4%)
Reflux Nephropathy	12 (4.5%)	9 (3%)	10 (3%)	11 (4%)	7 (3%)
Diabetic Nephropathy	105 (40%)	112 (40%)	138 (47%)	97 (37%)	104 (38%)
Miscellaneous	29 (11%)	21 (8%)	25 (9%)	27 (10%)	29 (11%)
Uncertain	13 (4.5%)	12 (4%)	16 (5%)	22 (9%)	13 (5%)
Total	**263 (100%)**	**281 (100%)**	**292 (100%)**	**260 (100%)**	**273 (100%)**

* New patients receiving first peritoneal dialysis treatment

PERITONITIS

Australian median time to first peritonitis has increased to 19.3 months overall, with 31% of patients completely free of peritonitis at three years. In New Zealand the time was 16.2 months (24% of patients free of peritonitis at three years) (fig 6.20). As noted in previous reports there is a strong association between ethnicity and peritonitis free survival (fig 6.23).

The median peritonitis-free survival for home automated peritoneal dialysis patients was 21.7 months in Australia, and 19.8 months in New Zealand.

Previous work from the Registry has shown the independent predictors of time to first peritonitis episode were higher BMI, diabetes mellitus, age, indigenous race, cigarette smoking, presence of coronary artery disease, presence of chronic lung disease and earlier year of commencement of peritoneal dialysis. (McDonald SP, Collins JF, Rumpsfeld M, Johnson DW. Perit Dial Int. 2004: 24;340-346.)

Figure 6.20

First PD Treatment to First Episode of Peritonitis
Related to Age at Entry 2000 to 31-Dec-2004

Survival	Age Groups 00-14	15-34	35-54	55-64	65-74	>=75	All
Australia	**n=80**	**n=316**	**n=1001**	**n=824**	**n=1096**	**n=633**	**n=3950**
3 months	76 ± 5.0 (49)	90 ± 1.7 (255)	86 ± 1.1 (761)	88 ± 1.2 (634)	86 ± 1.1 (815)	84 ± 1.5 (445)	86 ± 0.6 (2959)
6 months	66 ± 5.8 (36)	82 ± 2.3 (196)	77 ± 1.4 (587)	77 ±1.6 (503)	76 ± 1.4 (640)	73 ± 1.9 (346)	76 ± 0.7 (2308)
9 months	57 ± 6.3 (24)	75 ± 2.7 (151)	68 ± 1.6 (464)	71 ± 1.7 (401)	68 ± 1.6 (517)	67 ± 2.1 (282)	69 ± 0.8 (1839)
1 year	52 ± 6.8 (16)	69 ± 3.1 (111)	62 ± 1.8 (357)	63 ± 1.9 (316)	60 ± 1.7 (410)	61 ± 2.2 (230)	62 ± 0.9 (1440)
2 years	42 ± 8.4 (13)	48 ± 4.0 (37)	42 ± 2.1 (135)	44 ± 2.2 (118)	41 ± 1.9 (150)	42 ± 2.6 (82)	42 ± 1.0 (525)
3 years	-	35 ± 5.0 (11)	30 ± 2.4 (47)	32 ± 2.6 (43)	28 ± 2.2 (53)	32 ± 3.0 (26)	31 ± 1.2 (181)
New Zealand	**n=33**	**n=113**	**n=376**	**n=359**	**n=342**	**n=150**	**n=1373**
3 months	75 ± 7.6 (24)	90 ± 2.9 (90)	85 ± 1.9 (294)	83 ± 2.0 (274)	84 ± 2.0 (251)	87 ± 2.8 (111)	85 ± 1.0 (1044)
6 months	62 ± 8.6 (18)	75 ± 4.3 (71)	72 ± 2.4 (223)	72 ± 2.5 (217)	71 ± 2.6 (199)	78 ± 3.6 (80)	73 ± 1.3 (808)
9 months	55 ± 9.1 (13)	71 ± 4.6 (61)	67 ± 2.6 (193)	63 ± 2.7 (174)	63 ± 2.8 (157)	71 ± 4.3 (59)	65 ± 1.4 (657)
1 year	55 ± 9.1 (11)	63 ± 5.0 (47)	59 ± 2.8 (160)	55 ± 2.9 (139)	55 ± 3.0 (114)	60 ± 5.0 (45)	57 ± 1.5 (516)
2 years	-	40 ± 5.8 (18)	38 ± 3.0 (65)	34 ± 3.0 (56)	36 ± 3.4 (38)	38 ± 5.7 (14)	37 ± 1.6 (194)
3 years	-	-	26 ± 3.2 (22)	22 ± 3.0 (23)	22 ± 3.7 (13)	-	24 ± 1.7 (71)

% Survival ± S.E. and Numbers at risk

Figure 6.21

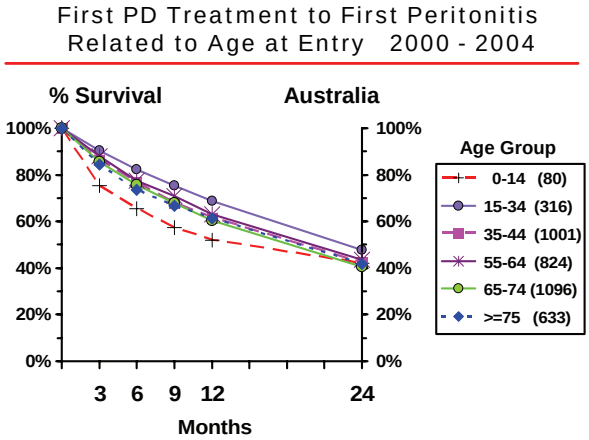


Figure 6.22

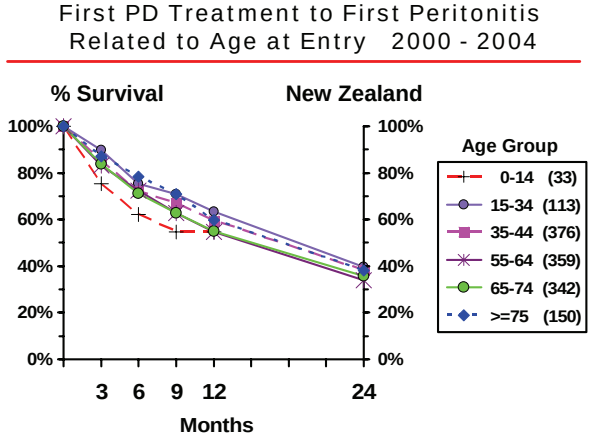
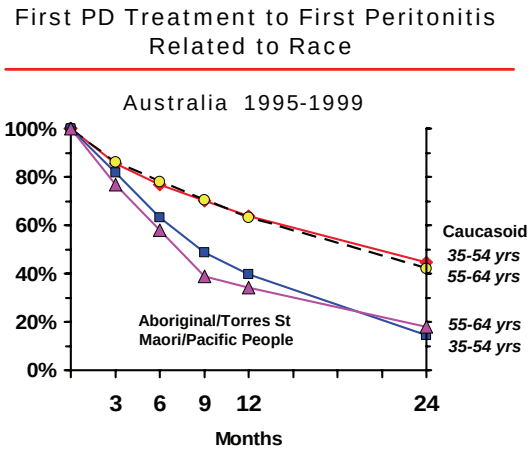


Figure 6.23



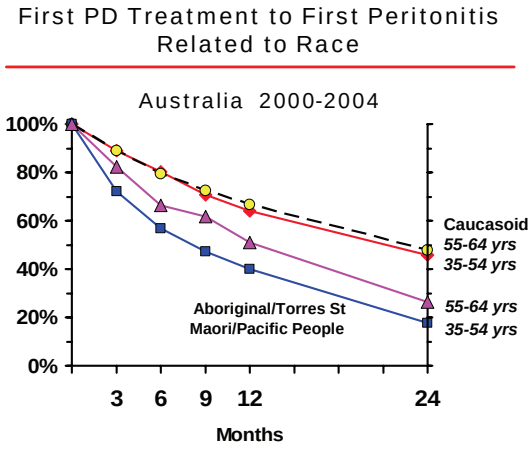
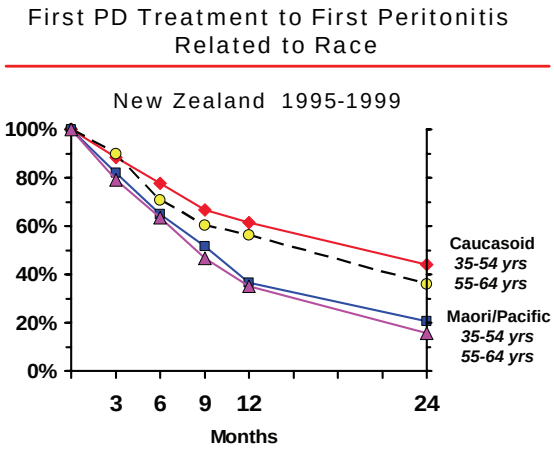


Figure 6.24



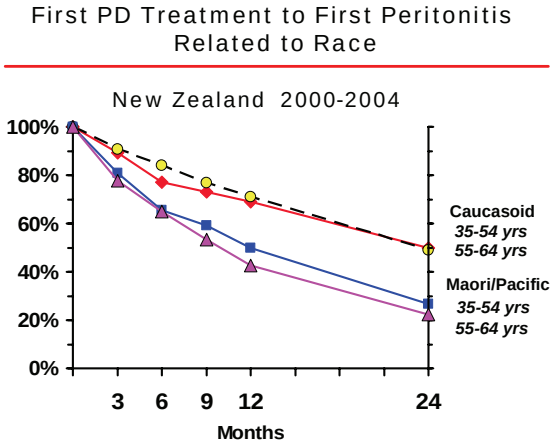


Figure 6.25

First Home APD Treatment to First Episode of Peritonitis
Related to Age at Entry 2000 to 31-Dec-2004

Survival	Age Groups						All
	00-14	15-34	35-54	55-64	65-74	>=75	
Australia	**n=55**	**n=163**	**n=430**	**n=303**	**n=360**	**n=197**	**n=1508**
1 month	87 ± 4.5 (47)	98 ± 1.2 (154)	94 ± 1.2 (387)	97 ± 1.0 (281)	97 ± 1.0 (338)	97 ± 1.2 (182)	96 ± 0.3 (1389)
3 months	77 ± 5.8 (37)	89 ± 2.6 (126)	86 ± 1.7 (319)	91 ± 1.7 (234)	90 ± 1.6 (289)	90 ± 2.3 (150)	88 ± 0.8 (1155)
6 months	64 ± 6.9 (26)	76 ± 3.6 (88)	76 ± 2.2 (244)	84 ± 2.3 (180)	82 ± 2.1 (232)	83 ± 2.9 (122)	80 ± 1.1 (892)
9 months	58 ± 7.3 (19)	71 ± 4.0 (66)	67 ± 2.5 (179)	75 ± 2.8 (137)	74 ± 2.6 (186)	76 ± 3.4 (98)	72 ± 1.3 (685)
1 year	55 ± 7.7 (13)	65 ± 4.5 (46)	61 ± 2.8 (136)	68 ± 3.2 (105)	69 ± 2.7 (146)	70 ± 3.8 (78)	66 ± 1.4 (524)
2 years	-	45 ± 5.8 (16)	41 ± 3.3 (44)	50 ± 4.1 (39)	49 ± 3.6 (45)	48 ± 4.9 (24)	46 ± 1.8 (169)
N. Zealand	**n=28**	**n=30**	**n=91**	**n=62**	**n=45**	**n=23**	**n=279**
1 month	86 ± 6.6 (24)	87 ± 6.2 (26)	97 ± 1.9 (83)	93 ± 3.2 (55)	93 ± 3.8 (39)	95 ± 4.4 (20)	93 ± 1.5 (247)
3 months	82 ± 7.3 (21)	80 ± 7.4 (22)	85 ± 3.9 (69)	92 ± 3.6 (49)	83 ± 5.9 (31)	71 ± 10.0 (14)	84 ± 2.3 (206)
6 months	66 ± 9.2 (17)	72 ± 8.5 (16)	76 ± 4.8 (54)	83 ± 5.1 (37)	71 ± 7.4 (21)	71 ± 10.0 (10)	75 ± 2.8 (155)
9 months	58 ± 9.9 (11)	72 ± 8.5 (13)	65 ± 5.5 (43)	67 ± 7.0 (26)	63 ± 8.4 (14)	56 ± 12.3 (7)	64 ± 3.2 (114)
1 year	-	60 ± 10.5 (9)	65 ± 5.5 (37)	58 ± 7.7 (16)	59 ± 8.9 (13)	48 ± 12.9 (6)	60 ± 3.4 (90)

% Survival ± S.E. and Numbers at risk

Figure 6.26

Causes of Technique Failure 1-Apr-1999 to 31-Mar-2002
Excluding Death, Transplantation,
Recovery of Renal Function

Causes of Technique Failure	Australia		New Zealand	
	Primary	Secondary	Primary	Secondary
Recurrent/persistent peritonitis	251	8	88	4
Acute peritonitis	298	8	122	4
Tunnel/exit site infection	68	3	9	1
Total Infective Complications	**617 (28%)**	**19 (17%)**	**219 (36%)**	**9 (30%)**
Inadequate solute clearance	296	12	114	6
Inadequate fluid ultrafiltration	172	12	38	3
Excessive fluid ultrafiltration	1	1	1	-
Total Dialysis Failure	**469 (21%)**	**25 (22%)**	**153 (25%)**	**9 (30%)**
Dialysate leak	153	21	47	8
Hydrothorax	12	-	3	1
Catheter block	34	1	4	-
Catheter fell out	11	-	1	-
Hernia	72	5	6	-
Abdominal pain	8	2	2	-
Abdominal surgery	57	3	14	1
Other surgery	13	-	3	-
Haemoperitoneum	1	-	-	-
Sclerosing Peritonitis	8	1	2	-
Excessive weight gain	3	-	-	-
Miscellaneous	22	2	5	-
Multiple adhesions	-	-	5	-
Total Technical Failure	**394 (18%)**	**35 (30%)**	**92 (15%)**	**10 (33%)**
Unable to manage self care	188	10	30	1
Patient preference	564	26	106	1
Transfer outside Australia/N.Z.	2	-	3	-
Total Social Reasons	**754 (34%)**	**36 (31%)**	**139 (23%)**	**2 (7%)**

Figure 6.27

Causes of Technique Failure 1-Apr-2002 to 31-Dec-2004
Excluding Death, Transplantation,
Recovery of Renal Function

Causes of Technique Failure	Australia		New Zealand	
	Primary	Secondary	Primary	Secondary
Recurrent/persistent peritonitis	224	12	67	2
Acute peritonitis	286	8	93	2
Tunnel/exit site infection	63	3	10	-
Total Infective Complications	**573 (27%)**	**23 (18%)**	**170 (26%)**	**4 (19%)**
Inadequate solute clearance	349	11	139	3
Inadequate fluid ultrafiltration	146	13	88	3
Excessive fluid ultrafiltration	2	-	-	-
Total Dialysis Failure	**497 (23%)**	**24 (19%)**	**227 (34%)**	**6 (29%)**
Dialysate leak	118	10	37	2
Hydrothorax	13	-	1	-
Scrotal oedema	1	-	-	-
Catheter block	34	4	6	-
Catheter fell out	8	-	1	-
Catheter tear	1	-	-	-
Hernia	49	3	16	-
Abdominal pain	10	2	8	-
Abdominal surgery	37	1	9	2
Other surgery	31	1	5	-
Haemoperitoneum	1	-	1	-
Sclerosing Peritonitis	5	1	3	-
Excessive weight gain	2	-	-	-
Miscellaneous	10	2	6	1
Total Technical Failure	**320 (15%)**	**24 (19%)**	**93 (14%)**	**5 (24%)**
Unable to manage self care	163	13	44	-
Patient preference	595	41	108	6
Transfer outside Australia/N.Z.	5	-	16	-
Total Social Reasons	**763 (35%)**	**54 (43%)**	**168 (26%)**	**6 (29%)**

TECHNIQUE FAILURE (CENSORED FOR DEATH OR TRANSPLANTATION)

In Australia, the most common primary cause of technique failure was a social reason (generally patient preference). This accounted for 35% of transfers in the era 2002-2004 (fig 6.27) and was comparable to that observed in the era 1999-2002 (34%; fig 6.26). Infections (primarily peritonitis) were the second commonest cause, followed by inadequate dialysis and mechanical/technical complications. Again, the overall frequencies of the reasons for completion of PD therapy were comparable between era 1999-2002 and 2002-2004.

In New Zealand, the most common primary cause of technique failure was inadequate dialysis, which accounted for 34% of transfers in the era 2002-2004 (fig 6.27). Infective and social reasons each accounted for 26% of technique failures. This represents an appreciable shift in the distribution of technique failure causes compared with the preceding era 1999-2002, during which infective complications were the most common primary reason for haemodialysis transfer (36%) followed by dialysis failure, social reasons and mechanical/technical complications (fig 6.26).

Figure 6.28

Causes of Technique Failure 1-Apr-1999 to 31-Dec-2004

Causes of Technique Failure	Diab.	Non-diab.	Race						Age Group		Total
			Asian	Abor./ Torres S.Isl.	Cauc.	Maori	Pac.Is.	Other	19-54	>=55	
Australia											
Infective	303	884	115	175	855	7	23	12	397	767	**1187**
	30%	27%	29%	50%	25%	29%	32%	36%	27%	28%	**28%**
Reduced Solute Clearance	121	522	59	24	541	1	13	5	255	378	**643**
	12%	16%	15%	7%	16%	4%	18%	15%	17%	14%	**15%**
Inadequate Ultrafiltration	78	239	22	21	267	2	2	3	125	189	**317**
	8%	7%	6%	6%	8%	8%	3%	9%	8%	7%	**7%**
Technical	120	477	30	52	498	5	10	2	190	400	**597**
	12%	15%	8%	15%	15%	21%	14%	6%	13%	15%	**14%**
Social	384	1126	168	80	1219	9	23	11	521	965	**1510**
	38%	35%	43%	23%	36%	38%	32%	33%	35%	36%	**35%**
Total	**1006**	**3248**	**394**	**352**	**3380**	**24**	**71**	**33**	**1488**	**2699**	**4254**
New Zealand											
Infective	162	225	21	-	146	153	66	1	122	262	**387**
	32%	32%	25%	-	28%	33%	45%	33%	26%	37%	**32%**
Reduced Solute Clearance	108	145	14	-	93	121	25	-	117	133	**253**
	21%	20%	17%	-	18%	26%	17%	-	25%	19%	**21%**
Inadequate Ultrafiltration	58	68	9	-	66	44	6	1	53	72	**126**
	12%	10%	11%	-	13%	10%	4%	33%	11%	10%	**10%**
Technical	61	96	15	-	73	53	16	-	62	92	**157**
	12%	14%	18%	-	14%	12%	11%	-	13%	13%	**13%**
Social	114	174	24	-	142	86	35	1	117	151	**288**
	23%	25%	29%	-	27%	19%	24%	33%	25%	21%	**24%**
Total	**503**	**708**	**83**	**-**	**520**	**457**	**148**	**3**	**471**	**710**	**1211**

PERITONEAL TRANSPORT STATUS

Since prospective collection began on 1st April 1999, peritoneal equilibration test (PET) data were supplied for 2969 (72%) patients in Australia and 1150 (28%) patients in New Zealand.

The mean±SD dialysate:plasma creatinine ratio at four hours (D:P Cr 4h) was 0.69 ± 0.13. Overall, the proportions of the different peritoneal transport categories were 16% high, 49% high average, 29% low average and 5% low, similar to what has been reported in other PD patient populations.

Higher peritoneal transport status was associated with significantly worse PD patient survival in Australia (fig. 6.29) and New Zealand (fig. 6.30). This has been explored in greater depth (see Rumpsfeld M, McDonald SP, Johnson DW. J Am Soc Nephrol In Press).

Compared with low and low-average transporters, high and high-average transporters were more likely to be male and had lower mean BMI's (fig 6.31). Racial origin, smoking status and the ratio of Australian to New Zealand residents also varied significantly between each of the peritoneal transport groups. However, other baseline demographic and clinical characteristics were comparable between the different peritoneal transport categories. This has also been explored in greater depth (see Rumpsfeld M, McDonald SP, Purdie DM, Collins JF, Johnson DW. Am J Kidney Dis 2004: 43: 492-501).

Figure 6.29

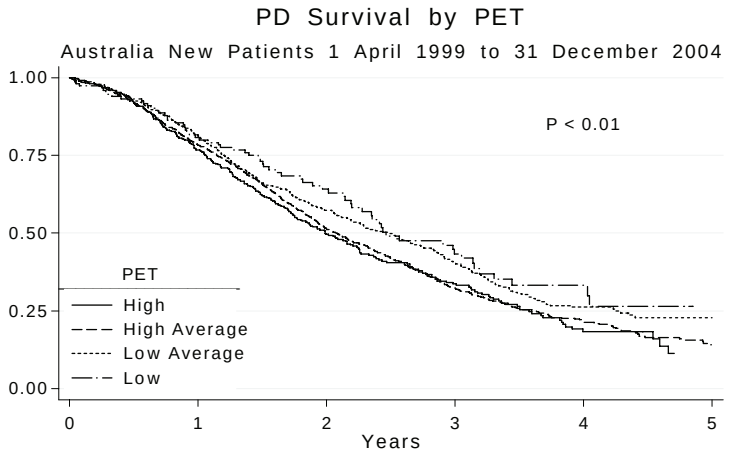


Figure 6.30

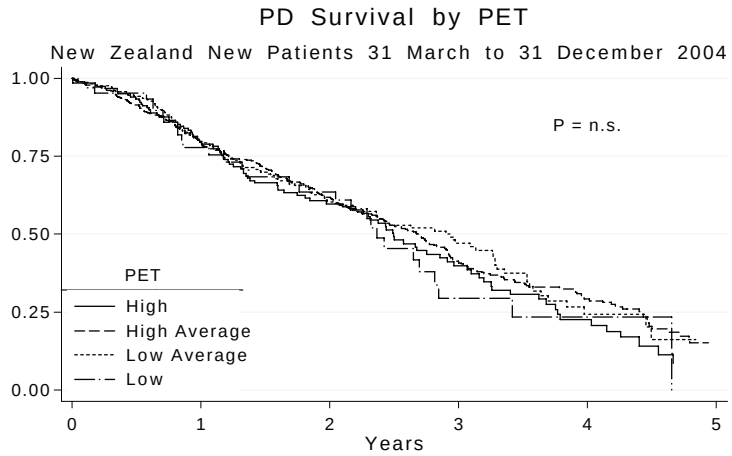


Figure 6.31

Baseline Characteristics of Study Population

Variable		Breakdown by Transport Category				Crude P	Total Population (n=4119)
		High (n=676; 16%)	High Average (n=2020; 49%)	Low Average (n=1208; 29%)	Low (n=215; 5%)		
Australia		**490 (72%)**	**1406 (70%)**	**922 (76%)**	**151 (70%)**	**Pr <0.01**	**2969 (72%)**
New Zealand		**186 (28%)**	**614 (30%)**	**286 (24%)**	**64 (30%)**		**1150 (28%)**
Gender	Female	285 (42%)	874 (43%)	609 (50%)	122 (57%)	Pr <0.001	1890 (46%)
	Male	391 (58%)	1146 (57%)	599 (50%)	93 (43%)		2229 (54%)
Racial Origin	Caucasoid	467 (69%)	1408 (70%)	843 (70%)	149 (69%)	Pr <0.001	2867 (70%)
	Abor./TSI	50 (7%)	88 (4%)	75 (6%)	12 (6%)		225 (5%)
	Asian	34 (5%)	162 (8%)	91 (8%)	13 (6%)		300 (7%)
	Maori/Pac.P.	69 (10%)	198 (10%)	113 (9%)	29 (13%)		409 (10%)
	Indian	12 (2%)	57 (3%)	40 (3%)	10 (5%)		119 (3%)
	Other	44 (7%)	107 (5%)	46 (4%)	2 (<1%)		199 (5%)
Age	Total Pop.	58.89±15.66	59.01±15.52	58.89±15.86	57.78±14.29	p 0.75	58.89±15.58
BMI	Total Pop.	25.82±5.09	26.39±5.18	26.76±5.32	26.95±5.30	p<0.01	26.44±5.22
BMI Category (kg/m)	<18.5	23 (3%)	58 (3%)	31 (3%)	7 (3%)	Pr <0.01	119 (3%)
	18.5-24.9	304 (46%)	828 (42%)	443 (38%)	74 (35%)		1649 (41%)
	25-30	219 (33%)	656 (33%)	442 (37%)	74 (35%)		1391 (34%)
	>30	114 (17%)	446 (22%)	264 (22%)	57 (27%)		881 (22%)
Smoking	Never	298 (44%)	972 (48%)	620 (51%)	107 (50%)	Pr <0.01	1997 (48%)
	Current	111 (16%)	262 (13%)	124 (10%)	32 (15%)		529 (13%)
	Former	267 (40%)	786 (39%)	463 (38%)	76 (35%)		1592 (39%)
Hypertension	No	63 (9%)	197 (10%)	117 (10%)	20 (9%)	Pr = 0.99	397 (10%)
	Yes	613 (91%)	1823 (90%)	1091 (90%)	195 (91%)		3722 (90%)
Chronic Lung Disease	No	582 (86%)	1770 (88%)	1056 (87%)	186 (87%)	Pr = 0.75	3594 (87%)
	Yes	94 (14%)	250 (12%)	152 (13%)	29 (13%)		525 (13%)
Cerebrovascular Disease	No	573 (85%)	1718 (85%)	1056 (87%)	192 (89%)	Pr = 0.10	3539 (86%)
	Yes	103 (15%)	302 (15%)	152 (13%)	23 (11%)		580 (14%)
Peripheral Vascular Disease	No	500 (74%)	1499 (74%)	907 (75%)	168 (78%)	Pr = 0.60	3074 (75%)
	Yes	176 (26%)	521 (26%)	301 (25%)	47 (22%)		1045 (25%)
Coronary Artery Disease	No	403 (60%)	1230 (61%)	764 (63%)	134 (62%)	Pr = 0.40	2531 (61%)
	Yes	273 (40%)	790 (39%)	444 (37%)	81 (38%)		1588 (39%)
Diabetes	No	392 (58%)	1233 (61%)	743 (62%)	138 (64%)	Pr = 0.58	2506 (61%)
	Type 1	31 (5%)	91 (5%)	48 (4%)	11 (5%)		181 (4%)
	Type 2	253 (38%)	696 (34%)	417 (35%)	66 (31%)		1432 (35%)
Previous HD >90 days		70 (10%)	185 (9%)	103 (9%)	24 (11%)	Pr = 0.44	382 (9%)

PERITONITIS REGISTRY
1-OCT-2003 TO 31-DEC-2004

STEPHEN MCDONALD AND KYM BANNISTER

The Australian Peritonitis Registry began to collect data from participating units on 1st October 2003 and data presented here cover the period 1st October 2003 to 31st December 2004. The aim of this Registry was to address the requests from the Australian PD community for more detailed national level data about the causes and treatment of peritonitis. This Registry is restricted to Australia; a more extensive peritonitis registry has been conducted in New Zealand for some years.

Over the period 1/10/03-31/12/04, there were1435 episodes of peritonitis among 909 people in Australia. Over this time, a total of 2829 people received PD treatment over that time in Australia. The number of episodes in each person is shown in Figure 6.32. The overall rate of peritonitis was 0.63 [0.60-0.66] per year, or 1 per 19 person-months. There was considerable variation between states in observed rates (fig. 6.33).

Of the 1426 episodes where organisms reported, 166 were culture negative, 151 (11%) had 2 organisms reported and 9 (0.6%) had 3 organisms reported in the initial culture results. The distribution of organisms is shown in Figure 6.34.

The Registry received 1420 records of treatment from the peritonitis episodes:

- 296 (21%) cases were treated with a single antibiotic
- 954 (67%) cases with 2 antibiotic
- 170 (12%) cases with 3 antibiotics

In 853 episodes, a second antibiotic regimen was reported, a mean of 4.6 [3.7-5.7] days after first regimen. In 210 episodes a third antibiotic regimen was reported, a mean of 6.9 [3.3-10.4] days after second regimen.

Figure 6.32

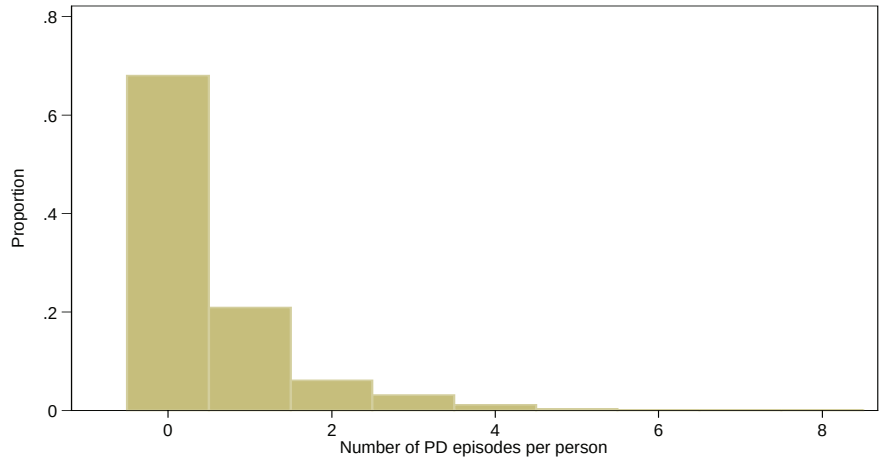


Figure 6.33

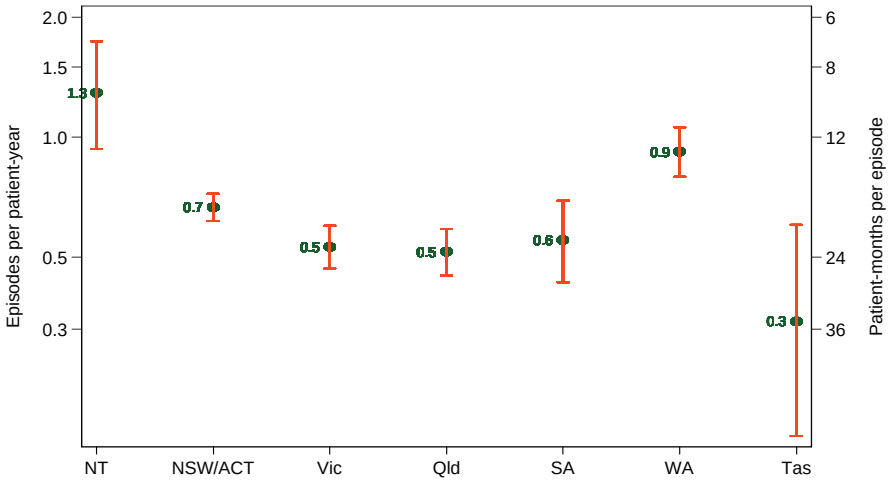


Figure 6.34

Primary Infecting Organism

Primary Infecting Organism	Frequency	Percent
Culture Negative	166	12%
Coag. Neg. Staph	339	24%
MRSA	47	3%
Staph aureus, non MRSA	154	11%
Other Gram Pos	191	13%
Gram Negative Organism	391	27%
Anaerobes	4	<1%
Fungi	50	4%
Mycobacteria	1 <1	<1%
Other	77	5%
No culture taken	6	<1%