

CHAPTER 11

Haemodialysis Practices

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SECTION 11.1: VASCULAR ACCESS AND ITS COMPLICATIONS

There was a progressive decline in the percentage of patients having native vascular access from 98% in 1997 to 93% in 2006. The ratio of brachiocephalic fistula (BCF) to arteriovascular fistula (AVF) has increased. In 2006, 25% of native vascular access was BCF. The proportion of patients with artificial graft and permanent catheter remained at 2% respectively. (Table 11.1.1)

Table 11.1.1: Vascular Access on Haemodialysis, 1997-2006

Access types	1997		1998		1999		2000		2001	
	No.	%	No.	%	No.	%	No.	%	No.	%
Wrist AVF	1427	85	1763	84	2406	81	3561	82	4049	79
BCF*	213	13	273	13	431	14	655	15	897	17
Venous graft	4	0	6	0	8	0	11	0	19	0
Artificial graft	13	1	20	1	34	1	31	1	64	1
Permanent CVC	4	0	8	0	17	1	19	0	25	0
Temporary CVC*	20	1	37	2	77	3	77	2	90	2
Temporary FVC*	0	0	0	0	0	0	0	0	0	0
TOTAL	1681	100	2107	100	2973	100	4354	100	5144	100

Access types	2002		2003		2004		2005		2006	
	No.	%	No.	%	No.	%	No.	%	No.	%
Wrist AVF	4680	78	5249	75	5891	73	6405	69	7704	68
BCF*	1068	18	1359	19	1693	21	2169	23	2793	25
Venous graft	14	0	23	0	41	1	30	0	22	0
Artificial graft	78	1	114	2	150	2	221	2	275	2
Permanent CVC	43	1	62	1	99	1	180	2	229	2
Temporary CVC*	138	2	180	3	233	3	269	3	291	3
Temporary FVC*	0	0	0	0	0	0	7	0	21	0
TOTAL	6021	100	6987	100	8107	100	9281	100	11335	100

* BCF=Brachiocephalic fistula

* CVC= Central venous catheter

* FVC= Femoral venous catheter

Table 11.1.2: Difficulties reported with Vascular Access, 1997-2006

Access difficulty	1997		1998		1999		2000		2001	
	No.	%	No.	%	No.	%	No.	%	No.	%
Difficulty with needle placement	55	47	82	4	133	5	146	4	217	5
Difficulty in obtaining desired blood flow rate	48	41	60	3	112	5	136	4	239	5
Other difficulties	12	10	30	2	55	2	32	1	39	1
No difficulties	1	1	1778	91	2155	88	3402	92	4276	90
TOTAL	116	100	1950	100	2455	100	3716	100	4771	100

Access difficulty	2002		2003		2004		2005		2006	
	No.	%	No.	%	No.	%	No.	%	No.	%
Difficulty with needle placement	215	4	217	3	255	3	319	4	391	3
Difficulty in obtaining desired blood flow rate	235	4	243	4	301	4	354	4	354	3
Other difficulties	57	1	60	1	67	1	58	1	45	0
No difficulties	5073	91	5970	92	6957	92	8339	92	10416	93
TOTAL	5580	100	6490	100	7580	100	9070	100	11206	100

Complication rates have remained similar despite an increase in intake of elderly and diabetic patients on dialysis in recent years. (Table 11.1.3)

Table 11.1.3: Complications reported with Vascular Access, 1997-2006

Complication	1997		1998		1999		2000		2001	
	No.	%	No.	%	No.	%	No.	%	No.	%
Thrombosis	71	19	69	3	129	5	148	4	209	4
Bleed	23	6	37	2	23	1	30	1	62	1
Aneurysmal dilatation	121	33	134	6	159	6	208	5	212	4
Swollen limb	35	9	36	2	51	2	44	1	67	1
Access related infection, local/systemic	29	8	21	1	34	1	52	1	49	1
Distal limb ischaemia	4	1	12	1	9	0	26	1	22	0
Venous outflow obstruction	45	12	50	2	71	3	78	2	123	2
Carpal tunnel	23	6	19	1	35	1	42	1	41	1
Others	18	5	48	2	64	2	37	1	74	1
No complications	0	0	1636	79	2119	79	3237	83	4204	83
TOTAL	369	100	2062	100	2694	100	3902	100	5063	100

Complication	2002		2003		2004		2005		2006	
	No.	%	No.	%	No.	%	No.	%	No.	%
Thrombosis	202	3	220	3	284	4	289	3	313	3
Bleed	66	1	54	1	67	1	73	1	68	1
Aneurysmal dilatation	211	4	199	3	193	2	179	2	244	2
Swollen limb	56	1	55	1	77	1	84	1	88	1
Access related infection, local/systemic	52	1	43	1	70	1	63	1	76	1
Distal limb ischaemia	17	0	13	0	37	0	35	0	30	0
Venous outflow obstruction	101	2	119	2	151	2	170	2	197	2
Carpal tunnel	44	1	63	1	49	1	55	1	48	0
Others	118	2	118	2	133	2	109	1	113	1
No complications	4988	85	5963	87	6896	87	8113	88	9987	89
TOTAL	5855	100	6847	100	7957	100	9170	100	11164	100

SECTION 11.2: HD PRESCRIPTION

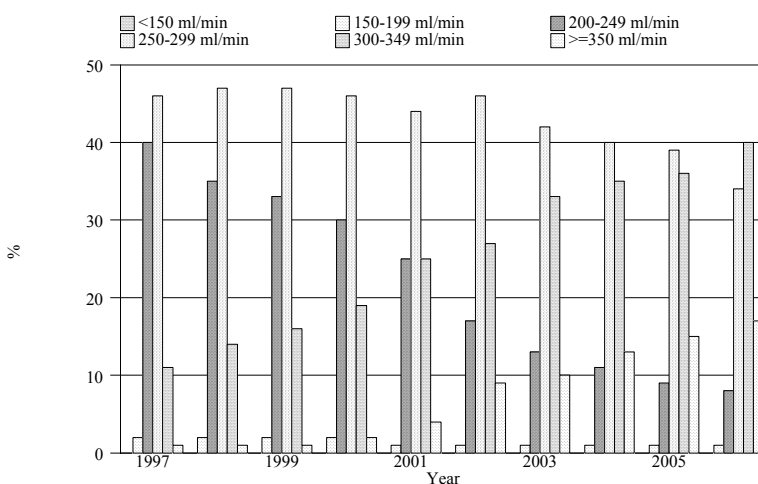
There was an increasing trend towards the use of higher blood flow rates from 1997 to 2006. The proportion of patients with blood flow of 300-349mls/min has increased from 11% to 40% and those with blood flow rates ≥ 350 mls/min from 1% to 17%. Fifty seven percent of patients had blood flow rates of ≥ 300 mls/min in 2006. (Table 11.2.1 and Fig 11.2.1)

Table 11.2.1: Blood Flow Rates in HD centres, 1997– 2006

Blood flow rates	1997		1998		1999		2000		2001	
	No.	%	No.	%	No.	%	No.	%	No.	%
<150 ml/min	2	0	4	0	6	0	9	0	7	0
150-199 ml/min	34	2	36	2	65	2	85	2	69	1
200-249 ml/min	649	40	735	35	962	33	1282	30	1233	25
250-299 ml/min	734	46	968	47	1367	47	1938	46	2229	44
300-349 ml/min	176	11	298	14	455	16	814	19	1276	25
≥ 350 ml/min	18	1	30	1	31	1	94	2	216	4
TOTAL	1613	100	2071	100	2886	100	4222	100	5030	100

Blood flow rates	2002		2003		2004		2005		2006	
	No.	%	No.	%	No.	%	No.	%	No.	%
<150 ml/min	9	0	4	0	11	0	7	0	5	0
150-199 ml/min	69	1	84	1	86	1	94	1	100	1
200-249 ml/min	973	17	882	13	879	11	814	9	904	8
250-299 ml/min	2692	46	2865	42	3112	40	3523	39	3738	34
300-349 ml/min	1590	27	2241	33	2711	35	3226	36	4471	40
≥ 350 ml/min	505	9	690	10	1020	13	1328	15	1900	17
TOTAL	5838	100	6766	100	7819	100	8992	100	11118	100

Figure 11.2.1: Blood Flow Rates in HD centres, 1997–2006



Ninety seven percent of patients were on 3 haemodialysis (HD) sessions / week. The small percentage of patients on 2 HD sessions / week is likely to be patients who were dialyzing in private centres and unable to afford 3 HD sessions / week. (Table 11.2.2)

Table 11.2.2: Number of HD Sessions per week, 1997 – 2006

HD sessions per week	1997		1998		1999		2000		2001	
	No.	%	No.	%	No.	%	No.	%	No.	%
1	1	0	1	0	4	0	8	0	8	0
2	6	0	5	0	153	5	341	8	337	7
3	1664	99	2110	100	2811	95	3982	92	4761	92
4	9	1	2	0	3	0	10	0	50	1
TOTAL	1680	100	2118	100	2971	100	4341	100	5156	100

HD sessions per week	2002		2003		2004		2005		2006	
	No.	%	No.	%	No.	%	No.	%	No.	%
1	10	0	15	0	11	0	7	0	25	0
2	369	6	343	5	281	3	265	3	267	2
3	5603	93	6558	95	7709	96	9010	97	11148	97
4	18	0	9	0	30	0	31	0	33	0
TOTAL	6000	100	6925	100	8031	100	9313	100	11473	100

Majority of patients (99%) were on 4 hours HD session. (Table 11.2.3)

Table 11.2.3: Duration of HD, 1997 – 2006

Duration of HD per session	1997		1998		1999		2000		2001	
	No.	%	No.	%	No.	%	No.	%	No.	%
<=3 hours	7	0	3	0	4	0	8	0	6	0
-3.5 hours	3	0	18	1	9	0	12	0	33	1
-4 hours	1594	95	1993	94	2735	92	4053	93	4956	96
-4.5 hours	69	4	91	4	160	5	189	4	106	2
-5 hours	8	0	8	0	61	2	77	2	59	1
>5 hours	1	0	3	0	0	0	13	0	0	0
TOTAL	1682	100	2116	100	2969	100	4352	100	5160	100

Duration of HD per session	2002		2003		2004		2005		2006	
	No.	%	No.	%	No.	%	No.	%	No.	%
<=3 hours	18	0	11	0	23	0	22	0	28	0
-3.5 hours	15	0	7	0	17	0	17	0	7	0
-4 hours	5845	98	6761	98	7830	97	9152	98	11321	99
-4.5 hours	68	1	76	1	119	1	67	1	68	1
-5 hours	48	1	66	1	47	1	54	1	40	0
>5 hours	0	0	0	0	3	0	0	0	1	0
TOTAL	5994	100	6921	100	8039	100	9312	100	11465	100

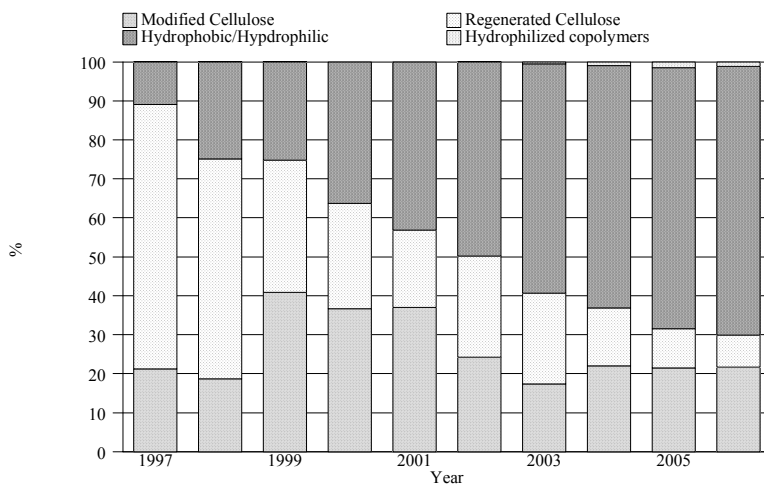
The use of synthetic membrane (hydrophobic/ hydrophilic and hydrophilised copolymer) has increased from 11% in 1997 to 70% in 2006. Regenerated cellulose membrane usage has progressively declined from 67% in 1997 to 8% in 2006. The use of modified cellulose membrane has remained relatively the same. (Table 11.2.4 and Fig. 11.2.4)

Table 11.2.4: Dialyser membrane types in HD centres, 1997 – 2006

Dialyser membrane	1997		1998		1999		2000		2001	
	No.	%	No.	%	No.	%	No.	%	No.	%
Modified Cellulose	360	21	395	19	1224	41	1605	37	1666	37
Regenerated Cellulose	1148	68	1195	56	1012	34	1183	27	890	20
Hydrophobic/Hydrophilic	184	11	524	25	754	25	1589	36	1944	43
Hydrophilized copolymers	1	0	2	0	1	0	0	0	0	0
TOTAL	1693	100	2116	100	2991	100	4377	100	4500	100

Dialyser membrane	2002		2003		2004		2005		2006	
	No.	%	No.	%	No.	%	No.	%	No.	%
Modified Cellulose	1376	24	1115	17	1718	22	1919	21	2333	22
Regenerated Cellulose	1473	26	1502	23	1150	15	901	10	882	8
Hydrophobic/Hydrophilic	2828	50	3782	59	4843	62	5976	67	7432	69
Hydrophilized copolymers	1	0	35	1	74	1	132	1	121	1
TOTAL	5678	100	6434	100	7785	100	8928	100	10768	100

Figure 11.2.4: Dialyser membrane types in HD centres, 1997 – 2006



Reuse of dialysers is a common practice in Malaysia whereby 95% reuse the dialyser. The frequency of reuse depends on the type of dialyser membrane. Five percent of patients did not reuse dialysers. In 2006, 75% of patients reuse their dialysers 10 times or more. (Table 11.2.5)

Table 11.2.5: Dialyser Reuse Frequency in HD centres, 1997- 2006

Dialyser reuse frequency	1997		1998		1999		2000		2001	
	No.	%	No.	%	No.	%	No.	%	No.	%
1*	21	1	16	1	65	2	116	3	152	3
2	9	1	5	0	13	0	17	0	15	0
3	996	63	215	11	191	7	205	5	232	5
4	174	11	113	6	250	9	477	12	416	9
5	194	12	137	7	264	10	312	8	357	7
6	154	10	1072	55	1414	51	1730	43	1413	29
7	2	0	37	2	46	2	69	2	85	2
8	4	0	66	3	122	4	357	9	793	16
9	30	2	109	6	179	6	101	2	132	3
10	0	0	84	4	96	3	246	6	400	8
11	0	0	23	1	6	0	4	0	43	1
12	0	0	64	3	118	4	333	8	470	10
>=13	0	0	0	0	0	0	91	2	331	7
TOTAL	1584	100	1941	100	2764	100	4058	100	4839	100

Dialyser reuse frequency	2002		2003		2004		2005		2006	
	No.	%	No.	%	No.	%	No.	%	No.	%
1*	197	4	251	4	319	4	196	4	392	5
2	41	1	19	0	42	1	1	0	5	0
3	316	6	349	5	194	3	81	2	36	0
4	337	6	339	5	192	3	85	2	75	1
5	318	6	267	4	192	3	137	3	187	3
6	1216	22	915	14	806	11	555	10	589	8
7	124	2	71	1	89	1	44	1	63	1
8	866	16	852	13	809	11	477	9	410	6
9	59	1	87	1	50	1	46	1	115	2
10	538	10	880	14	1160	16	770	15	911	13
11	36	1	25	0	42	1	12	0	100	1
12	879	16	1511	24	1916	26	1353	26	2238	31
>=13	644	12	819	13	1644	22	1548	29	2161	30
TOTAL	5571	100	6385	100	7455	100	5305	100	7282	100

Ninety nine percent of patients were on bicarbonate dialysate buffer in 2006 compared to 67% in 1997. In 2006, 147 patients were still using acetate as a buffer. (Table 11.2.6)

Table 11.2.6: Dialysate Buffer used in HD centres, 1997 – 2006

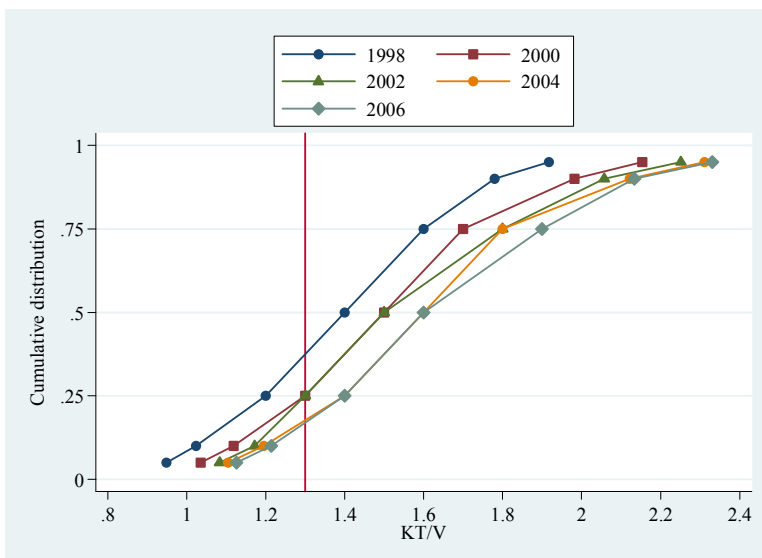
Dialysate buffer	1997		1998		1999		2000		2001	
	No.	%	No.	%	No.	%	No.	%	No.	%
Acetate	551	33	627	30	552	19	393	9	240	5
Bicarbonate	1123	67	1492	70	2429	81	3969	91	4920	95
TOTAL	1674	100	2119	100	2981	100	4362	100	5160	100
Dialysate buffer	2002		2003		2004		2005		2006	
	No.	%	No.	%	No.	%	No.	%	No.	%
Acetate	138	2	76	1	33	0	58	1	147	1
Bicarbonate	5880	98	6815	99	7957	100	9268	99	11457	99
TOTAL	6018	100	6891	100	7990	100	9326	100	11604	100

The median prescribed KT/V was 1.6. The percentage of patients with $KT/V \geq 1.3$ has increased from 60% in 1997 to 84% in 2006. Since 2002, the median KT/V has remained the same. (Table 11.2.7a and Fig. 11.2.7a)

Table 11.2.7a: Distribution of prescribed KT/V, HD patients 1997-2006

Year	No. of subjects	Mean	SD	Median	LQ	UQ	% patients ≤ 1.3
1997	1558	1.4	0.3	1.4	1.2	1.6	59
1998	2022	1.4	0.3	1.4	1.2	1.6	67
1999	2831	1.5	0.3	1.5	1.3	1.7	73
2000	4087	1.5	0.4	1.5	1.3	1.8	75
2001	4908	1.6	0.4	1.5	1.3	1.8	78
2002	5496	1.6	0.4	1.6	1.4	1.8	81
2003	6516	1.6	0.4	1.6	1.4	1.8	82
2004	7453	1.6	0.4	1.6	1.4	1.8	82
2005	8749	1.6	0.4	1.6	1.4	1.9	83
2006	10919	1.7	0.4	1.6	1.4	1.9	84

Figure 11.2.7a: Cumulative distribution of prescribed KT/V, HD patients 1997-2006



In 2006, 142 (37.4%) centres returned data on delivered KT/V. Overall delivered KT/V data were reported in 37.9% of HD patients. The methods of measuring KT/V were urea kinetic modeling (64.1%), online modeling (23.5%) and others (12.4%).

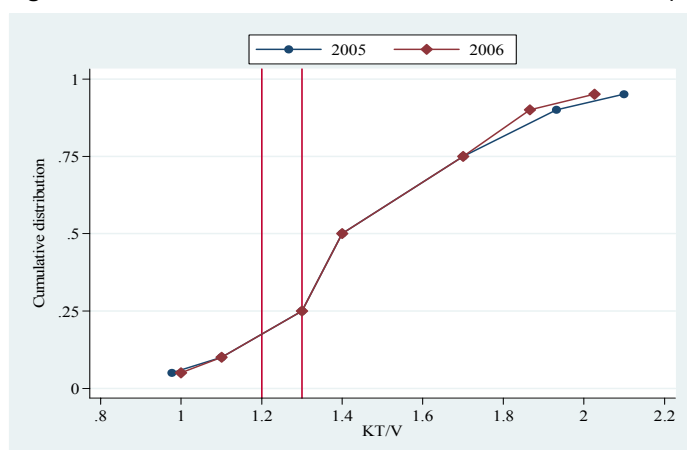
Table 11.2.7b and Fig. 11.2.7b shows that although the prescribed median KT/V was 1.6, the delivered median KT/V was only 1.4. In 2006, the percentage of patients with a delivered KT/V ≥ 1.2 and KT/V ≥ 1.3 was 82% and 66% respectively.

Table 11.2.7b: Distribution of delivered KT/V, HD patients 2005-2006

Year	No. of subjects	Mean	SD	Median	LQ	UQ	% patients ≤ 1.2	% patients ≤ 1.3	Variance*
2005	1760	1.6	2.7	1.4	1.3	1.7	82	65	0
2006	5553	1.5	1.3	1.4	1.3	1.7	82	66	0

* (prescribed KT/V – delivered KT/V)/ prescribed KT/V

Figure 11.2.7b: Cumulative distribution of delivered KT/V, HD patients 2005-2006



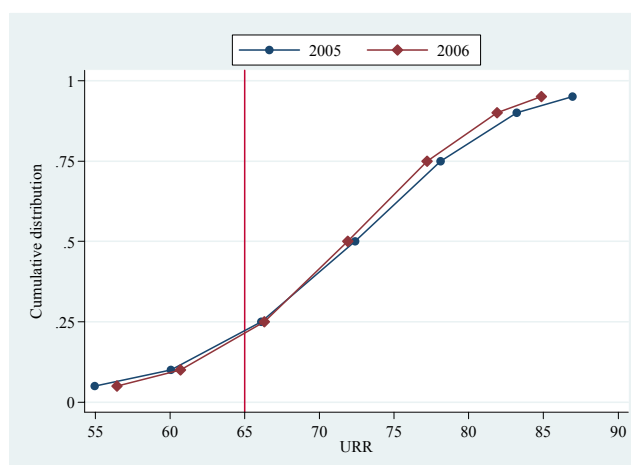
Data returns for Urea Reduction Ratio (URR) were better than that of delivered KT/V. Overall 201 centres (52.9%) representing 55.1% of HD population submitted data on URR. Post dialysis blood sampling methodologies were not requested for and hence not specified.

In 2006, the median URR was 71.9% and the percentage of patients with URR $\geq 65\%$ was 79%. (Table 11.2.7c and Fig. 11.2.7c)

Table 11.2.7c Distribution of URR, HD patients 2005 – 2006

Year	No. of subjects	Mean	SD	Median	LQ	UQ	% patients ≤ 65
2005	2514	71.8	10.3	72.4	66.1	78.1	79
2006	8065	71.4	9.2	71.9	66.3	77.2	79

Figure 11.2.7c Cumulative distribution of URR, HD patients 2005 - 2006



The median blood flow rates among centres had increased from 250 mls/min in 1997 to 300mls/min in 2006. There is still a wide variation in practices among centres. The median blood flow rates among centres ranges from 220mls/min to 400mls/min. (Table 11.2.8(a) and Fig. 11.2.8 (a))

Table 11.2.8: Variation in HD prescription among HD centres 2006

Table 11.2.8(a) Median blood flow rates in HD patients

Year	No. of centres	Min	5 th Centile	LQ	Median	UQ	95 th Centile	Max
1997	45	200	200	220	250	250	280	300
1998	46	200	200	230	250	250	300	300
1999	67	200	200	230	250	250	300	300
2000	100	200	200	240	250	275	300	300
2001	116	200	220	250	252.5	300	300	350
2002	137	200	230	250	280	300	300	350
2003	155	200	240	250	280	300	325	350
2004	184	220	250	257.5	287.5	300	350	400
2005	228	200	250	260	300	300	350	400
2006	279	210	250	270	300	300	350	400

Figure 11.2.8(a): Variation in median blood flow rates in HD patients among HD centres 2006

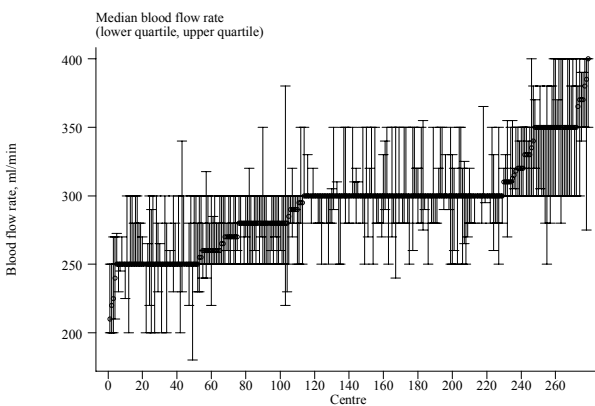
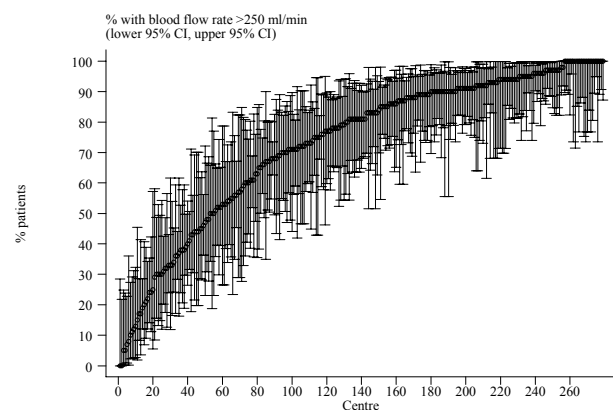


Figure 11.2.8(b): Variation in Proportion of patients with blood flow rates > 250 ml/min among HD centres 2006



There was an increase in the proportion of patients with blood flow rates from > 250mls/min. In 2006, 50% of centres had 81% of their patients with blood flow rates of > 250mls/min compared to only 13% in 1997. (Table 11.2.8(b))

There was still a wide variation in the proportion of patients with blood flow rate > 250mls/min among centres. Two centres that had no patients with blood flow rates of > 250mls/min. (Fig. 11.2.8 (b))

Table 11.2.8(b) Proportion of patients with blood flow rates > 250 ml/min

Year	No. of centres	Min	5 th Centile	LQ	Median	UQ	95 th Centile	Max
1997	45	0	0	4	13	27	60	64
1998	46	0	2	9	20.5	38	79	100
1999	67	0	2	8	28	49	85	100
2000	100	0	0	10.5	31.5	59.5	85.5	91
2001	116	0	0	22.5	49.5	73.5	92	100
2002	137	0	2	36	61	82	95	100
2003	155	0	4	42	70	85	98	100
2004	184	0	17	50	73	86	96	100
2005	228	0	17	54.5	77	90.5	99	100
2006	279	0	19	57	81	92	100	100

The majority of centres had 100% of their patients with 3 HD sessions/ week. There are some centres with significant proportion of their patients with their patients with less than 3 HD session/ week. (Table 11.2.8(c) and Fig. 11.2.8 (c))

Table 11.2.8(c) Proportion of patients with 3 HD sessions per week

Year	No. of centres	Min	5 th Centile	LQ	Median	UQ	95 th Centile	Max
1997	47	80	92	99	100	100	100	100
1998	46	80	98	100	100	100	100	100
1999	69	17	45	97	100	100	100	100
2000	100	25	44.5	90.5	100	100	100	100
2001	118	23	50	92	100	100	100	100
2002	137	28	48	94	99	100	100	100
2003	160	36	55	97	100	100	100	100
2004	188	37	70	98	100	100	100	100
2005	231	40	75	99	100	100	100	100
2006	283	52	83	98	100	100	100	100

Figure 11.2.8(c): Variation in proportion of patients with 3 HD sessions per week among HD centres 2006

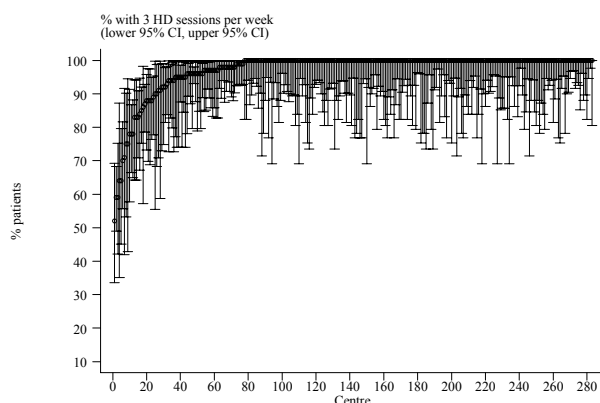
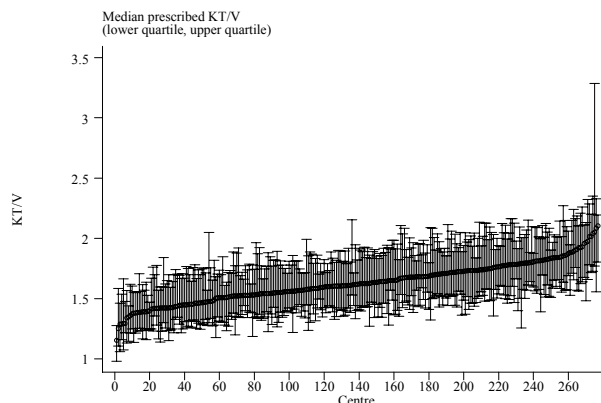


Figure 11.2.8(d): Variation in median prescribed KT/V in HD patients among HD centres 2006



The median prescribed KT/V in HD patients was 1.6 in 2006. The minimum prescribed KT/V was 1.2 and maximum prescribed KT/V was 2.1. (Table 11.2.8(d)) The variation of prescribed KT/V among centres (fig. 11.2.8 (d)) was less marked than the variation in proportion of patients with blood flow rates of > 250 mls/min. (fig. 11.2.8(b)).

Table 11.2.8(d): Median prescribed KT/V in HD patients

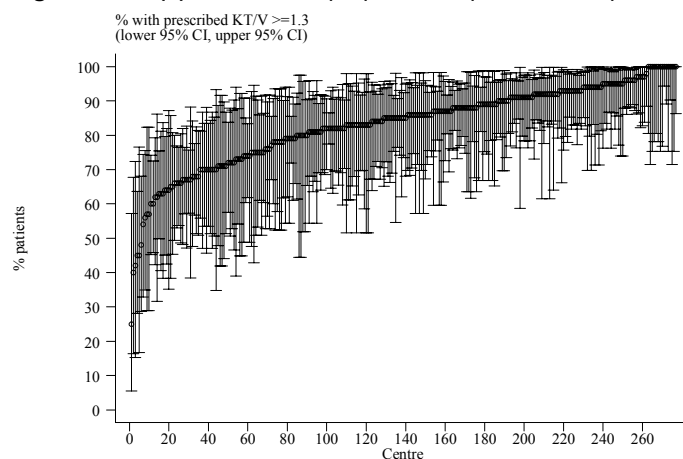
Year	No. of centres	Min	5 th Centile	LQ	Median	UQ	95 th Centile	Max
1997	44	1.2	1.2	1.3	1.4	1.4	1.5	1.8
1998	45	1.1	1.3	1.4	1.4	1.5	1.6	1.7
1999	67	1.2	1.3	1.4	1.5	1.6	1.7	1.8
2000	99	1.2	1.3	1.4	1.5	1.6	1.8	2.8
2001	114	1.2	1.3	1.5	1.5	1.7	1.8	1.9
2002	132	1.2	1.4	1.5	1.6	1.7	1.8	2.1
2003	150	1.2	1.4	1.5	1.6	1.7	1.9	2.1
2004	181	1.2	1.4	1.5	1.6	1.7	1.9	2.2
2005	224	1.3	1.4	1.5	1.6	1.7	1.9	2
2006	277	1.2	1.4	1.5	1.6	1.7	1.9	2.1

In 2006, half the centres had 85% of their patients with a prescribed KT/V ≥ 1.3 . However there was variation in proportion of patients with prescribed KT/V ≥ 1.3 among the HD centres ranging from below 30% in one centre to 100% in a small number of centres. (Fig. 11.2.8 (e))

Table 11.2.8(e): Proportion of patients with prescribed KT/V ≥ 1.3

Year	No. of centres	Min	5 th Centile	LQ	Median	UQ	95 th Centile	Max
1997	44	32	44	51.5	59.5	70	90	100
1998	45	0	46	60	67	74	85	96
1999	67	36	50	67	73	83	94	100
2000	99	26	47	66	79	86	94	100
2001	114	42	52	71	81.5	89	96	100
2002	132	35	58	74.5	82	90	97	100
2003	150	30	57	77	84	91	96	100
2004	181	28	61	74	83	91	100	100
2005	224	47	63	75	85	92	100	100
2006	277	25	62	76	85	92	100	100

Figure 11.2.8(e): Variation in proportion of patients with prescribed KT/V ≥ 1.3 among HD centres 2006

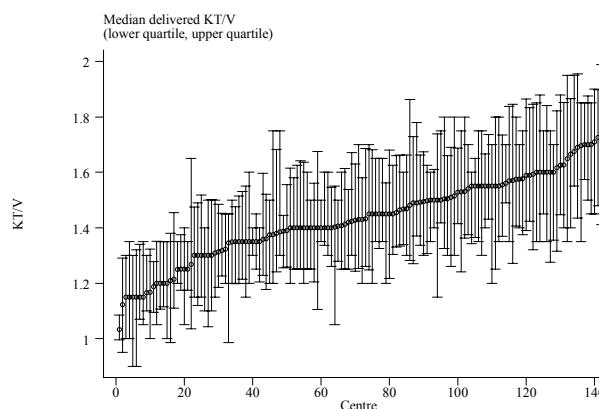


The median delivered KT/V in HD patients was 1.4 in 2006. The minimum delivered KT/V was 1.0 and maximum delivered KT/V was 1.7. There was marked variation of median delivered KT/V among HD centres. (Table 11.2.8 f and fig 11.2.8 f)

Table 11.2.8(f): Median delivered KT/V in HD patients

Year	No. of centres	Min	5 th Centile	LQ	Median	UQ	95 th Centile	Max
2005	52	1.2	1.2	1.3	1.4	1.5	1.7	1.7
2006	142	1	1.2	1.3	1.4	1.5	1.7	1.7

Figure 11.2.8(f): Variation in median delivered KT/V in HD patients among HD centres 2006

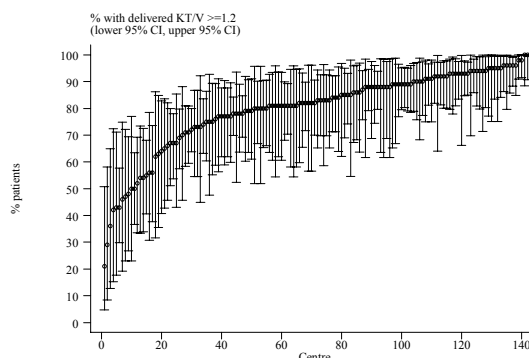


In 2006, 50% of centres had 82.5% of their patients with a delivered $KT/V \geq 1.2$. There was however a wide variation in the proportion of patients with a delivered $KT/V \geq 1.2$ among centres. Eleven centres had $< 50\%$ of their patients with a delivered $KT/V \geq 1.2$. Two centres had 100% of their patients with delivered $KT/V \geq 1.2$. (Table 11.2.8 g and Fig. 11.8.2 g)

Table 11.2.8(g) Proportion of patients with delivered $KT/V \geq 1.2$

Year	No. of centres	Min	5 th Centile	LQ	Median	UQ	95 th Centile	Max
2005	52	40	53	74	84	90.5	100	100
2006	142	21	47	75	82.5	90	96	100

Figure 11.2.8(g): Variation in proportion of patients with delivered $KT/V \geq 1.2$ among HD centres 2006

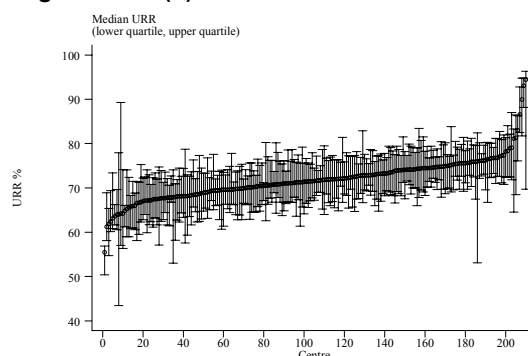


The median URR in HD centres was 71.6% in 2006. The minimum URR was 55.4% and maximum URR was 94.4%. (Table 11.2.8 h) There was variation of median URR among HD centres but the variation was less wide than the variation of delivered KT/V among HD centres as shown by the less steep curve. (fig 11.2.8 h and fig 11.2.8 h)

Table 11.2.8(h) Median URR among HD patients

Year	No. of centres	Min	5 th Centile	LQ	Median	UQ	95 th Centile	Max
2005	73	61.3	66.6	69.8	71.9	74.4	85.9	96.2
2006	210	55.4	64.8	69.1	71.6	74.4	78.2	94.4

Figure 11.2.8(h): Variation in median URR among HD patients, HD centres 2006

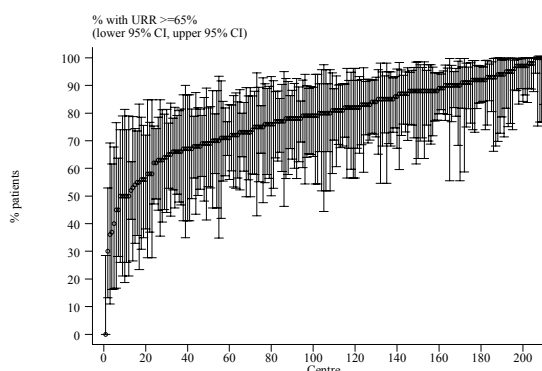


In 2006, 50% of centres had 80% of their patients with $URR \geq 65\%$. There was however a wide variation in the proportion of patients with $URR \geq 65\%$ among centres. Six centres had $< 50\%$ of their patients with a $URR \geq 65\%$. One centre had no patients with $URR \geq 65\%$. Four centres had 100% of their patients with a $URR \geq 65\%$. (Table 11.2.8 j and Fig. 11.8.2 j)

Table 11.2.8 (i) Proportion of HD patients with $URR \geq 65\%$

Year	No. of centres	Min	5 th Centile	LQ	Median	UQ	95 th Centile	Max
2005	73	40	53	70	81	88	100	100
2006	210	0	50	70	80	88	97	100

Figure 11.2.8(i): Variation in proportion of patients with $URR \geq 65\%$ among HD centres 2006



SECTION 11.3: TECHNIQUE SURVIVAL ON DIALYSIS

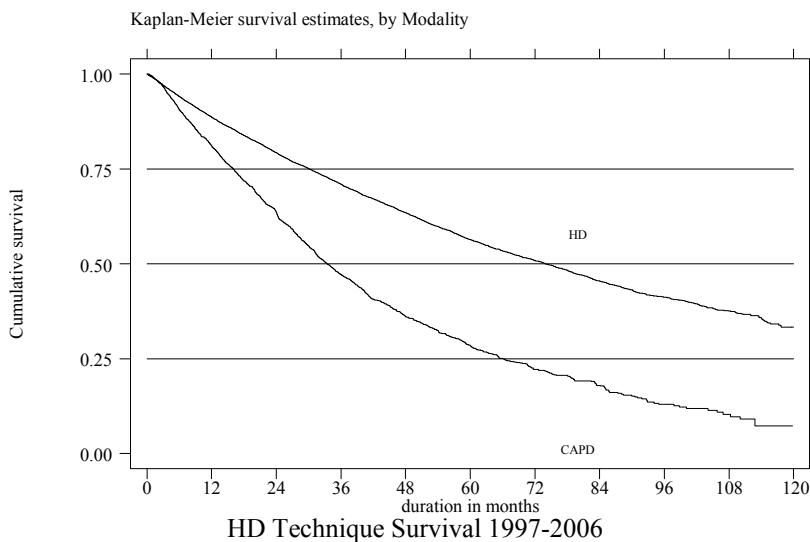
The unadjusted HD technique survival at 1 year, 5 years and 10 years was 89%, 56% and 33% respectively. The CAPD unadjusted technique survival was 81% at 1 year, 29% at 5 years and 7% at 10 years. (Table 11.3.2 and Fig. 11.3.1)

Table 11.3.1: Unadjusted technique survival by Dialysis modality, 1997-2006

Dialysis modality Interval (months)	CAPD			HD			All Dialysis		
	No.	% Survival	SE	No.	% Survival	SE	No.	% Survival	SE
6	2537	91	1	17560	94	0	20097	94	0
12	2087	81	1	14950	89	0	17037	88	0
24	1376	64	1	10955	79	0	12331	77	0
36	847	47	1	7895	71	0	8742	68	0
48	497	36	1	5592	63	0	6089	60	0
60	293	29	1	3809	56	0	4102	53	0
72	160	22	1	2536	51	1	2695	47	0
84	88	18	1	1578	45	1	1666	42	1
96	44	13	1	884	41	1	927	37	1
108	19	10	1	372	38	1	390	34	1
120	3	7	2	27	33	1	29	30	1

* No. = Number at risk SE=standard error

Figure 11.3.1: Unadjusted technique survival by Dialysis modality, 1997-2006



There was no apparent difference in the unadjusted HD technique survival by year of starting dialysis for the years 1997 to 2006. (Table 11.3.2 and fig 11.3.2)

Table 11.3.2: Unadjusted technique survival by year of entry, 1997-2006

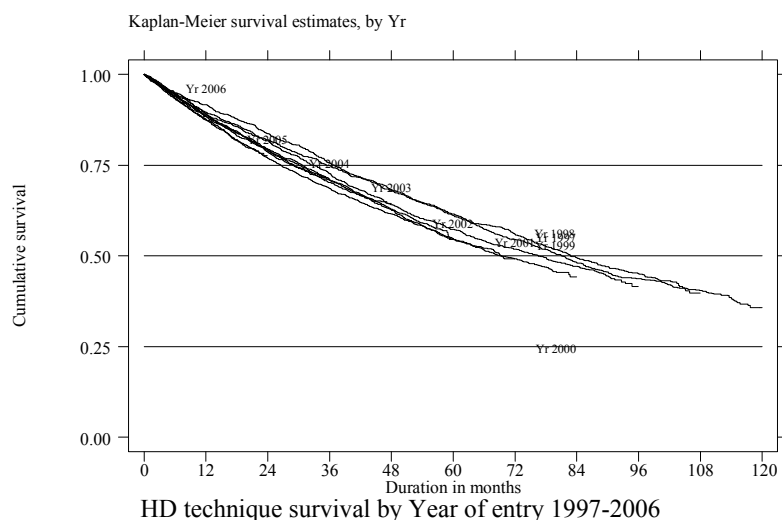
Year Interval (months)	1997			1998			1999		
	No.	% Survival	SE	No.	% Survival	SE	No.	% Survival	SE
6	946	93	1	1101	95	1	1321	95	1
12	891	89	1	1051	92	1	1236	90	1
24	810	82	1	942	84	1	1097	82	1
36	735	75	1	839	76	1	961	73	1
48	660	68	1	744	68	1	839	64	1
60	587	62	2	664	61	1	742	57	1
72	512	55	2	603	56	1	670	52	1
84	450	48	2	528	49	2	602	47	-
96	406	44	2	479	45	2	-	-	-
108	372	40	2	-	-	-	-	-	-
120	27	36	2	-	-	-	-	-	-

Year Interval (months)	2000			2001			2002			2003		
	No.	% Survival	SE	No.	% Survival	SE	No.	% Survival	SE	No.	% Survival	SE
6	1602	94	1	1766	93	1	2009	94	1	2157	94	0
12	1481	89	1	1620	87	1	1883	89	1	1998	88	1
24	1277	79	1	1404	77	1	1616	79	1	1764	79	1
36	1124	71	1	1235	69	1	1435	70	1	1565	71	1
48	982	63	1	1098	62	1	1274	63	1	-	-	-
60	853	55	1	966	55	1	-	-	-	-	-	-
72	756	49	1	-	-	-	-	-	-	-	-	-

Year Interval (months)	2004			2005			2006		
	No.	% Survival	SE	No.	% Survival	SE	No.	% Survival	SE
6	2534	94	0	2648	93	0	1482	94	1
12	2341	88	1	2453	88	1	-	-	-
24	2050	79	1	-	-	-	-	-	-

* No. = Number at risk SE=standard error

Figure 11.3.2: Unadjusted technique survival by year of entry, 1997-2006



The unadjusted HD technique survival was better in the younger age groups than the older age group, ten years unadjusted HD technique survival in the age group of 25-34, 35-44, 44-54, 55-64 and ≥ 65 years old was 71%, 46%, 36%, 20% and 13% respectively. (Table 11.3.3 and fig 11.3.3)

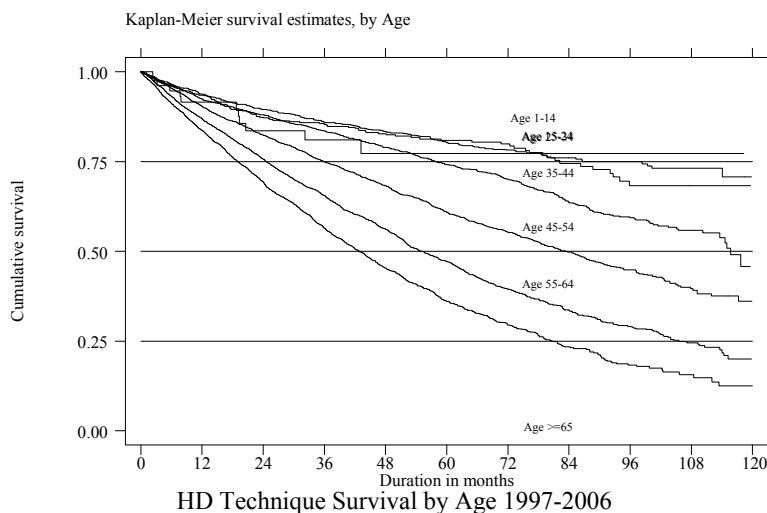
Table 11.3.3: Unadjusted technique survival by age, 1997-2006

Age group (years) Interval (months)	<=14			15-24			25-34			35-44		
	No.	% Survival	SE	No.	% Survival	SE	No.	% Survival	SE	No.	% Survival	SE
6	66	95	0	678	96	1	1412	96	1	2478	96	0
12	55	92	0	584	94	1	1242	94	1	2169	92	1
24	41	84	1	430	87	1	961	89	1	1727	88	1
36	28	81	1	334	85	1	770	86	1	1359	84	1
48	19	77	1	251	83	2	610	83	1	1051	79	1
60	13	77	1	190	81	2	444	80	1	803	74	1
72	11	77	1	141	80	2	347	78	1	575	70	1
84	9	77	1	97	75	3	235	76	2	367	64	1
96	5	77	1	56	68	3	144	75	2	226	59	2
108	3	77	1	31	68	3	65	73	2	98	56	2
120	-	-	-	4	68	3	4	71	3	4	46	4

Age group (years) Interval (months)	45-54			55-64			>=65		
	No.	% Survival	SE	No.	% Survival	SE	No.	% Survival	SE
6	4468	95	0	4888	93	0	3571	91	0
12	3817	90	0	4154	87	0	2931	84	1
24	2881	82	1	2958	76	1	1961	69	1
36	2111	75	1	2068	66	1	1231	56	1
48	1540	68	1	1393	56	1	730	45	1
60	1053	61	1	889	47	1	423	36	1
72	710	55	1	535	39	1	226	30	1
84	442	50	1	322	34	1	113	23	1
96	234	45	1	169	29	1	56	18	1
108	93	40	2	69	24	1	19	16	2
120	9	36	2	6	20	2	3	13	2

* No. = Number at risk SE=standard error

Figure 11.3.3: Unadjusted technique survival by age, 1997-2006



Unadjusted HD technique survival in non diabetics at 1 year, 5 years and 10years was 91%, 69% and 47% respectively. Unadjusted HD technique survival for diabetics was worse than non diabetics with at 86%, 43% and 15% at one, five and ten years respectively. (Table 11.3.4 and Fig 11.3.4)

Table 11.3.4: Unadjusted technique survival by Diabetes status, 1997-2006

Diabetes status Interval (months)	Non-Diabetic			Diabetic		
	No.	% Survival	SE	No.	% Survival	SE
6	8790	95	0	8770	93	0
12	7690	91	0	7260	86	0
24	5980	85	0	4975	73	0
36	4637	80	0	3258	62	1
48	3519	75	1	2073	52	1
60	2569	69	1	1240	43	1
72	1807	64	1	731	36	1
84	1181	59	1	398	30	1
96	680	55	1	205	25	1
108	311	51	1	62	20	1
120	23	47	2	5	15	2

* No. = Number at risk SE=standard error

Figure 11.3.4: Unadjusted technique survival by Diabetes status, 1997-2006

