

CHAPTER 12

**PERITONEAL DIALYSIS
PRACTICES**

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SECTION 12.1: MODALITIES AND PRESCRIPTION OF PD (Tables 12.1.1 -12.1.4)

In 2010, there were a total of 2360 patients on PD in Malaysia. While the overall number of PD patients has been increasing over the last decade, annual PD growth rates which were initially 15-16% in 2006/2007, 2007/2008 have tapered down to 6-6.7% in 2008/2009 and 2009/2010. In 2010, 87.5% of PD patients were on CAPD and 12.5 % on APD. APD penetration is increasing, albeit at a slow rate. DAPD is prescribed in up to 3.9% of patients to minimize fluid absorption during overnight dwell. This PD regime is utilised mainly as an alternative to Icodextrin use or APD which would be more costly.

Most patients are on the Baxter disconnect system (90.7%) and the majority (84.5%) do 4 exchanges per day. Nine percent of patients require 5 exchanges per day but this figure may not truly reflect the dwell volumes required for PD adequacy as some patients may be converted to haemodialysis rather than increase the number of daily exchanges. Most patients (86.3%) used a fill volume of 2 litres but up to 10.5% were using larger fill volumes

Table 12.1.1: Chronic Peritoneal Dialysis Regimes, 2001-2010

PD regime	2001		2002		2003		2004		2005	
	n	%	n	%	n	%	n	%	n	%
Standard CAPD	762	97.6	861	97	1192	96.8	1266	96.1	1303	93.2
DAPD	17	2.2	24	2.7	34	2.8	39	3	45	3.2
Automated PD/ CCPD	2	0.3	3	0.3	5	0.4	12	0.9	50	3.6
TOTAL	781	100	888	100	1231	100	1317	100	1398	100

PD regime	2006		2007		2008		2009		2010	
	n	%	n	%	n	%	n	%	n	%
Standard CAPD	1397	90	1547	85.7	1717	82.4	1847	83.5	1973	83.6
DAPD	67	4.3	115	6.4	121	5.8	119	5.4	91	3.9
Automated PD/ CCPD	88	5.7	144	8	245	11.8	246	11.1	296	12.5
TOTAL	1552	100	1806	100	2083	100	2212	100	2360	100

Table 12.1.2: CAPD Connectology, 2001-2010

CAPD Connectology	2001		2002		2003		2004		2005	
	n	%	n	%	n	%	n	%	n	%
Baxter disconnect	439	99.8	726	98.5	1048	87	1147	88.8	1286	92.1
Fresenius disconnect	0	0	11	1.5	154	12.8	145	11.2	111	7.9
Others	1	0.2	0	0	3	0.2	0	0	0	0
TOTAL	440	100	737	100	1205	100	1292	100	1397	100

CAPD Connectology	2006		2007		2008		2009		2010	
	n	%	n	%	n	%	n	%	n	%
Baxter disconnect	1425	92	1675	93.5	1955	93.9	2013	92.1	2126	90.7
Fresenius disconnect	119	7.7	116	6.5	124	6	173	7.9	218	9.3
Others	5	0.3	0	0	4	0.2	0	0	1	0
TOTAL	1549	100	1791	100	2083	100	2186	100	2345	100

Table 12.1.3: PD Number of Exchanges per day, 2001-2010

Number of Exchanges/ day	2001		2002		2003		2004		2005	
	n	%	n	%	n	%	n	%	n	%
2	1	0.1	0	0	4	0.3	6	0.5	3	0.2
3	5	0.6	11	1.3	14	1.2	12	0.9	25	1.8
4	735	95.2	834	95.5	1136	95.8	1225	94.6	1280	94.4
5	31	4	28	3.2	32	2.7	52	4	48	3.5
TOTAL	772	100	873	100	1186	100	1295	100	1356	100

Number of Exchanges/ day	2006		2007		2008		2009		2010	
	n	%	n	%	n	%	n	%	n	%
2	4	0.3	2	0.1	3	0.1	3	0.1	9	0.4
3	55	3.7	40	2.3	54	2.7	87	4.1	134	6.1
4	1359	91	1566	90.5	1728	86.4	1791	84.7	1865	84.5
5	76	5.1	123	7.1	216	10.8	233	11	198	9
TOTAL	1494	100	1731	100	2001	100	2114	100	2206	100

Table 12.1.4: PD Volume per Exchange, 2001-2010

Volume per Exchange (L)	2001		2002		2003		2004		2005	
	n	%	n	%	n	%	n	%	n	%
<1.5	32	4.3	37	4.4	41	3.5	42	3.3	55	4.1
1.5-1.9	0	0	0	0	0	0	0	0	0	0
2.0	711	94.5	793	94	1088	93.8	1154	91.9	1195	89
>2.0	9	1.2	14	1.7	31	2.7	60	4.8	92	6.9
TOTAL	752	100	844	100	1160	100	1256	100	1342	100

Volume per Exchange (L)	2006		2007		2008		2009		2010	
	n	%	n	%	n	%	n	%	n	%
<1.5	50	3.3	46	2.7	56	2.8	60	2.9	68	3.3
1.5-1.9	0	0	0	0	0	0	0	0	0	0
2.0	1315	87.7	1508	87.6	1756	87.8	1805	87.9	1791	86.3
>2.0	135	9	167	9.7	189	9.4	189	9.2	217	10.5
TOTAL	1500	100	1721	100	2001	100	2054	100	2076	100

SECTION 12.2: ACHIEVEMENT OF SOLUTE CLEARANCE AND PERITONEAL TRANSPORT

Seventy nine percent of patients achieved the K/DOQI target recommendation of Kt/V of ≥ 1.7 per week and the median delivered weekly Kt/V was 2.0. Comparison between PD centres according to the percentage of patients in each centre achieving this target Kt/V has shown a 1.5-fold variation between the highest- and lowest-performing centres (90% vs. 59%). Half of the centres were able to have up to 79% of their patients achieving this target (Tables and Figures 12.2.1 and 12.2.2).

Among incident PD patients high average transport status was commonest (37 %) followed by low average transport status (24%). Over time a proportion of patients will develop changes in their peritoneal membrane characteristics although contrary to expectation, there seems to be a reduction in the number of high/high average transporters when comparing incident with prevalent patients (Tables 12.2.3 and 12.2.4). This may be due to early transfer of such patients to HD . There is no apparent association between co-morbidities such as cardiovascular disease and diabetes with PET status.

Table 12.2.1: Distribution of delivered Kt/V, PD patients 2003-2010

Year	Number of Patients	Mean	SD	Median	LQ	UQ	% patients ≥ 1.7 per week
2003	763	2.1	0.5	2.1	1.8	2.5	83
2004	1038	2.1	0.5	2.1	1.8	2.4	85
2005	1092	2.1	0.5	2.1	1.8	2.4	83
2006	1266	2.1	0.5	2.1	1.8	2.4	84
2007	1412	2.1	0.5	2.1	1.8	2.4	83
2008	1679	2.1	0.5	2	1.8	2.4	82
2009	1837	2.1	0.5	2	1.8	2.4	81
2010	1913	2.1	0.5	2	1.7	2.3	79

Figure 12.2.1: Cumulative distribution of delivered Kt/V, PD patients 2003-2010

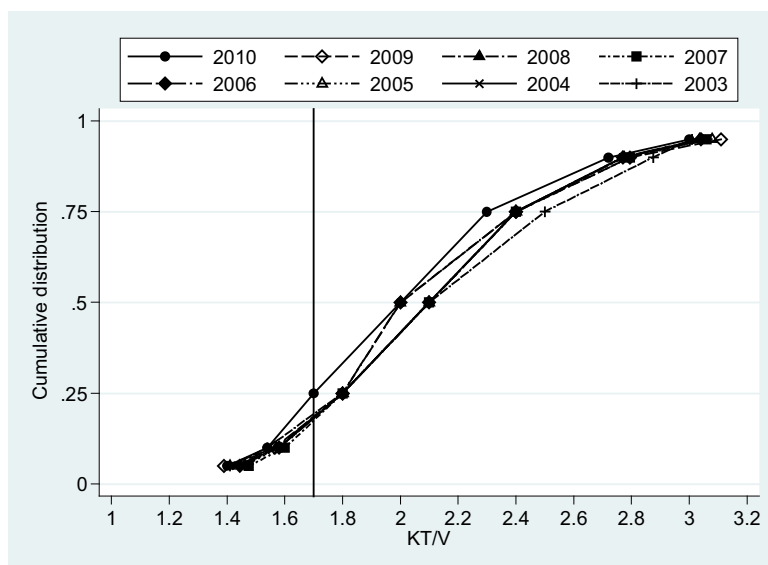
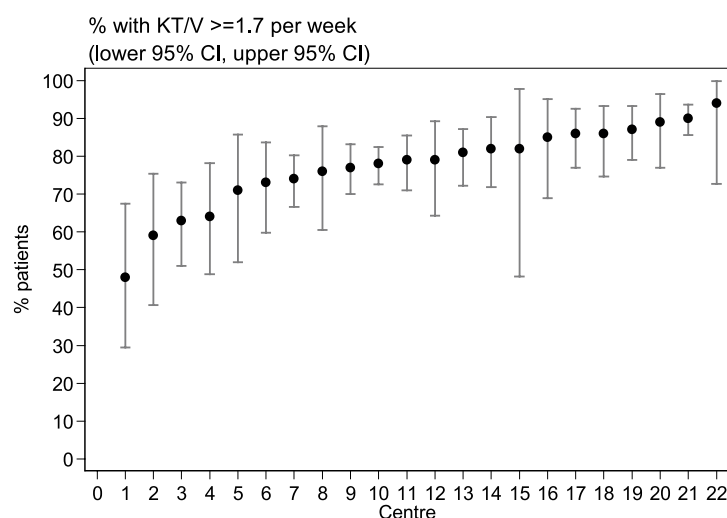


Table 12.2.2: Variation in proportion of patients with Kt/V ≥ 1.7 per week among PD centres, 2003-2010

Year	Number of centres	Min	5 th Centile	LQ	Median	UQ	95 th Centile	Max
2003	14	0	0	75	82.5	88	91	91
2004	17	75	75	79	85	88	100	100
2005	18	56	56	75	85	89	96	96
2006	20	66	66	78	82.5	91.5	100	100
2007	21	25	69	78	85	89	93	93
2008	20	33	50.5	76.5	80	89	93.5	96
2009	21	48	63	76	83	89	97	100
2010	22	48	59	73	79	86	90	94

Figure 12.2.2: Variation in proportion of patients with Kt/V ≥ 1.7 per week among PD centres 2010**Table 12.2.3:** Peritoneal transport status by PET D/P creatinine at 4 hours, new PD patients 2003-2010

Year	2003		2004		2005		2006		2007		2008		2009		2010	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Low	10	3	39	9	44	13	23	8	19	10	19	14	10	10	15	22
Low average	174	44	180	42	130	39	106	38	65	34	43	31	37	38	16	24
High average	171	43	168	39	118	35	106	38	78	41	50	36	33	34	25	37
High	39	10	41	10	42	13	41	15	28	15	25	18	18	18	11	16
TOTAL	394	100	428	100	334	100	276	100	190	100	137	100	98	100	67	100

Table 12.2.4: Peritoneal transport status by PET D/P creatinine at 4 hours, prevalent PD patients 2003-2010

Year	2003		2004		2005		2006		2007		2008		2009		2010	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Low	10	6	67	15	69	12	105	12	106	10	151	13	196	14	195	14
Low average	85	51	187	41	246	41	359	42	429	42	500	42	557	39	566	39
High average	62	37	176	38	223	37	315	37	392	38	415	35	478	34	501	34
High	11	7	29	6	62	10	75	9	95	9	114	10	186	13	181	13
TOTAL	168	100	459	100	600	100	854	100	1022	100	1180	100	1417	100	1443	100

Table 12.2.5: Association among PET and comorbidity, 2003-2010

Co morbidity	Low		Low Average		High Average		High	
	n	%	n	%	n	%	n	%
No CVD	757	13.2	2374	41.4	2031	35.4	576	10
CVD	142	10.1	555	39.5	531	37.8	177	12.6
No DM	567	13.8	1710	41.7	1427	34.8	396	9.7
DM	332	10.9	1219	40.1	1135	37.3	357	11.7

SECTION 12.3: TECHNIQUE SURVIVAL ON PD

Technique survival (not censored for death and transplant) revealed poorer survival in PD compared to HD modality. The Kaplan-Meier cumulative PD survival curves diverge as early as 6 months. One-, three- and five-year PD technique survival was 79%, 46% and 27% compared to 88%, 68% and 53% in HD respectively. Median PD technique survival time was 34 months (Table and Figure 12.3.1). The PD technique survival was analyzed for two different eras (2001-2004 versus 2005-2010) (Table and Figure 12.3.2) and it showed there has not been any significant improvement in technique survival over time.

The trend has been maintained with better technique survival seen in the younger groups (age < 25 years), while the elderly (age > 65 years) consistently had the worst technique survival (Table and Figure 12.3.3). Gender did not show any influence in technique survival during early period of treatment (<36 months). However, female gender appears to have better technique survival after 36 months (Table and Figure 12.3.4). Diabetics have poorer technique survival compared to non-diabetics (Table and Figure 12.3.5).

There was a clear association of technique survival with solute clearance. As expected, those with $Kt/v \geq 2.0$ demonstrated the best technique survival compared to those with $Kt/v \leq 1.7$ (Table and Figure 12.3.6).

Age above 25 years, diabetic status, male gender, presence of CVD, poor nutritional indices (low BMI, low serum albumin and low cholesterol), anaemia, hypercalcemia, hyperphosphatemia, poor BP control and assisted PD were associated with increased risk of drop-out from PD (Table 12.3.7). In year 2010, death remains the major factor for PD drop-out (65%), followed by peritonitis (15%) (Table 12.3.8).

Table 12.3.1: Unadjusted technique survival by Dialysis modality, 2001-2010

Dialysis Modality Interval (month)	PD			HD			All dialysis		
	n	% Survival	SE	n	% Survival	SE	n	% Survival	SE
0	4800	100	-	31900	100	-	36740	100	-
6	4041	90	0	28012	94	0	32053	93	0
12	3270	79	1	23915	88	0	27185	87	0
24	2107	62	1	17500	77	0	19607	75	0
36	1307	46	1	12701	68	0	14008	66	0
48	786	35	1	8913	61	0	9699	57	0
60	474	27	1	6048	53	0	6522	50	0
72	301	21	1	4022	47	0	4322	44	0
84	153	15	1	2456	41	0	2608	38	0
96	69	12	1	1394	37	0	1462	34	0
108	28	9	1	568	33	1	595	30	1
120	1	-	-	1	-	-	1	-	-

Figure 12.3.1: Unadjusted technique survival by Dialysis modality, 2001-2010

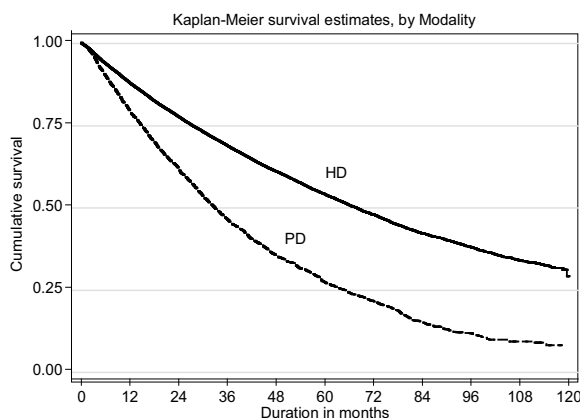


Table 12.3.2: Unadjusted technique survival by era 2001–2005 and 2006–2010

Era Interval (month)	2001 – 2005			2006 – 2010		
	n	% Survival	SE	n	% Survival	SE
0	1832	100	-	2968	100	-
6	1645	90	0.7	2399	90	0.56
12	1445	80	0.94	1825	79	0.8
24	1117	63	1.14	997	60	1.05
36	826	48	1.19	481	45	1.22
48	625	37	1.15	163	34	1.4
60	474	28	1.08	1	-	-
72	301	22	1.03	-	-	-
84	153	15	0.96	-	-	-
96	69	12	0.96	-	-	-
108	28	9	1.03	-	-	-
120	-	-	-	-	-	-

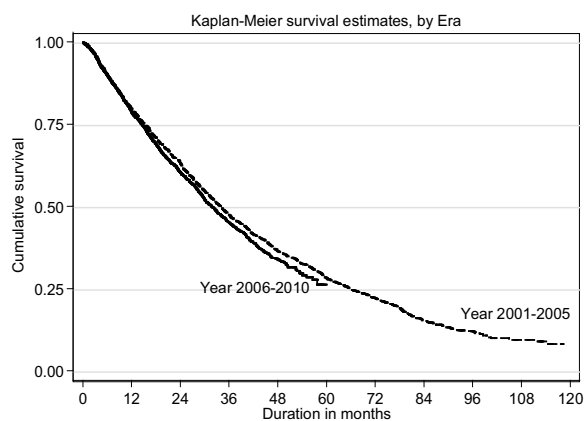
Figure 12.3.2: Unadjusted technique survival by era 2001–2005 and 2006–2010

Table 12.3.3: Unadjusted technique survival by age, 2001-2010

Age group (years) Interval (month)	<15			15-24			25-34			35-44		
	n	% Survival	SE	n	% Survival	SE	n	% Survival	SE	n	% Survival	SE
0	313	100	-	404	100	-	411	100	-	564	100	-
6	287	96	1	358	94	1	350	94	1	502	93	1
12	245	92	2	305	87	2	282	85	2	430	85	2
24	174	83	2	211	75	2	197	72	3	306	71	2
36	115	68	3	148	63	3	141	62	3	214	57	2
48	82	59	4	107	58	3	91	51	3	132	44	3
60	49	47	4	69	47	3	59	43	3	83	33	3
72	33	38	4	48	39	4	38	37	4	60	29	3
84	18	28	4	26	31	4	21	25	4	38	23	3
96	11	22	5	12	25	4	6	18	4	22	18	3
108	5	22	5	7	25	4	3	9	5	10	15	3
120	1	-	-	1	-	-	1	-	-	1	-	-

Age group (years) Interval (month)	45-54			55-64			≥65		
	n	% Survival	SE	n	% Survival	SE	n	% Survival	SE
0	1030	100	-	1172	100	-	906	100	-
6	884	91	1	974	89	1	692	83	1
12	731	81	1	780	77	1	501	66	2
24	472	61	2	483	57	2	272	45	2
36	295	45	2	272	40	2	128	28	2
48	187	33	2	144	28	2	49	16	2
60	116	26	2	77	20	2	27	10	2
72	67	19	2	46	14	2	15	7	2
84	30	12	2	20	8	1	6	4	1
96	14	10	2	6	5	2	4	3	1
108	6	7	2	1	-	-	2	2	1
120	1	-	-	1	-	-	1	-	-

Figure 12.3.3: Unadjusted technique survival by age, 2001-2010

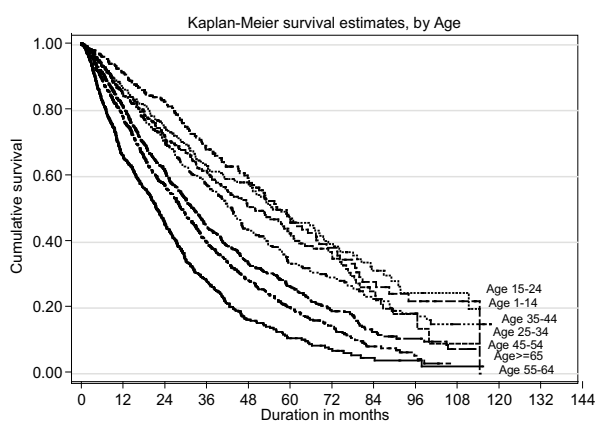
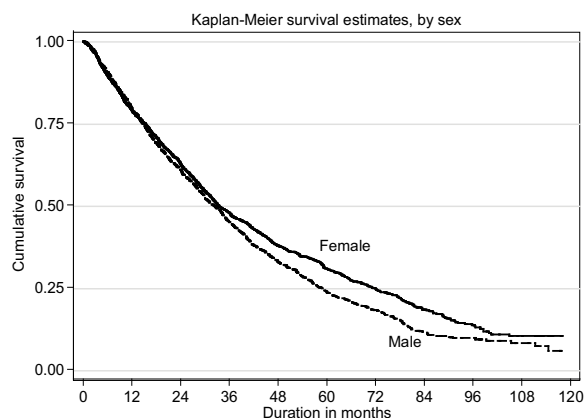
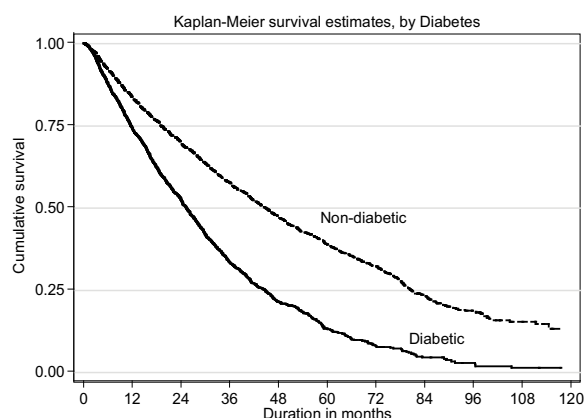


Table 12.3.4: Unadjusted technique survival by Gender, 2001-2010

Gender Interval (months)	Male			Female		
	n	% survival	SE	n	% survival	SE
0	2413	100	-	2387	100	-
6	2045	91	1	1999	90	1
12	1651	80	1	1619	79	1
24	1042	61	1	1066	62	1
36	634	45	1	673	48	1
48	362	33	1	425	38	1
60	208	24	1	268	31	1
72	126	18	1	176	25	1
84	60	12	1	94	18	1
96	29	10	1	41	13	1
108	11	8	1	18	10	1
120	1	-	-	1	-	-

Figure 12.3.4: Unadjusted technique survival by Gender, 2001-2010**Figure 12.3.5:** Unadjusted technique survival by Diabetes status, 2001-2010**Table 12.3.5:** Unadjusted technique survival by Diabetes status, 2001-2010

Diabetes status Interval (month)	Non-Diabetic			Diabetic		
	No.	% survival	SE	No.	% survival	SE
0	2719	100	-	2081	100	-
6	2310	92	1	1733	88	1
12	1867	84	1	1403	74	1
24	1276	70	1	831	52	1
36	881	58	1	426	33	1
48	592	47	1	195	21	1
60	385	39	1	90	13	1
72	263	32	1	39	8	1
84	140	23	1	14	4	1
96	64	18	1	6	3	1
108	26	15	2	3	1	1
120	1	-	-	1	-	-

Table 12.3.6: Unadjusted technique survival by Kt/V, 2001-2010

Kt/V Interval (months)	<1.7			1.7-2.0			>2.0		
	n	% Survival	SE	n	% Survival	SE	n	% Survival	SE
0	1974	100	-	2935	100	-	6031	100	-
6	1911	98	0	2853	99	0	5876	99	0
12	1780	94	1	2715	96	0	5547	95	0
24	1457	85	1	2313	87	1	4645	87	0
36	1124	72	1	1841	76	1	3621	75	1
48	811	60	1	1391	65	1	2753	66	1
60	596	48	1	1003	56	1	2053	58	1
72	411	39	1	750	49	1	1557	50	1
84	248	30	1	496	38	1	1051	41	1
96	156	26	1	283	30	1	680	34	1
108	90	20	1	170	23	1	456	29	1
120	58	18	1	87	18	1	273	24	1

Figure 12.3.6: Unadjusted technique survival by Kt/V, 2001-2010

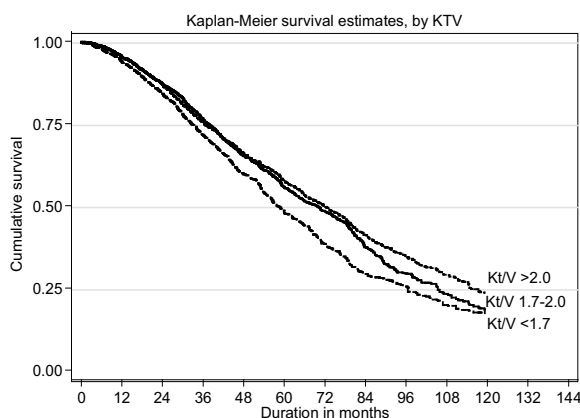


Table 12.3.7: Adjusted hazard ratio for change of modality, 2001-2010

Factors	n	Hazard Ratio	95% CI	p value
Age (years):				
• Age 1-14 (ref*)	313	1.00		
• Age 15-24	404	1.37	(1.01;1.87)	1.006
• Age 25-34	411	1.71	(1.25; 2.34)	0.001
• Age 35-44	564	2.06	(1.52;2.78)	<0.001
• Age 45-54	1030	2.47	(1.85;3.29)	<0.001
• Age 55-64	1172	2.76	(2.07;3.67)	<0.001
• Age ≥65	906	3.61	(2.69;4.84)	<0.001
Peritonitis				
• No (ref*)	4459	1.00		
• Yes	341	2.71	(2.36;3.11)	<0.001
Diabetes Mellitus				
• Non-diabetic (ref*)	2719	1.00		
• Diabetic	2081	1.47	(1.32;1.65)	<0.001
Gender:				
• Male (ref*)	2413	1.00		
• Female	2387	0.86	(0.78;0.95)	0.008
Cardiovascular Disease:				
• No CVD (ref*)	3780	1.00		
• CVD	1020	1.13	(1.01;1.27)	0.038

Table 12.3.7: Adjusted hazard ratio for change of modality, 2001-2010 (cont'd.)

BMI:				
• <18.5	614	1.34	(1.13;1.58)	0.001
• 18.5-<25 (ref*)	2472	1.00		
• ≥25	1714	0.98	(0.89;1.08)	0.674
Serum Albumin:				
• <30	1406	1.72	(1.52;1.95)	<0.001
• 30-<35	1845	1.10	(0.98;1.23)	0.117
• 35-<45 (ref*)	1512	1.00		
• ≥45	37	1.07	(0.50;2.27)	0.866
Serum Cholesterol:				
• <3.2	88	1.54	(1.12;2.11)	0.008
• 3.2-<5.2 (ref*)	2429	1.00		
• ≥5.2	2283	1.00	(0.91;1.10)	0.986
Diastolic BP:				
• <70	626	1.10	(0.94;1.28)	0.240
• 70-<80	1726	0.93	(0.84;1.04)	0.219
• 80-<90 (ref*)	1820	1.00		
• 90-<100	547	1.30	(1.10;1.52)	0.002
• ≥100	81	1.95	(1.29;2.93)	0.001
Hemoglobin:				
• <8	218	1.65	(1.28;2.12)	<0.001
• 8-<9	525	1.68	(1.41;2.00)	<0.001
• 9-<10	1079	1.37	(1.19;1.58)	<0.001
• 10-<11	1550	1.03	(0.90;1.17)	0.676
• 11-<12 (ref*)	930	1.00		
• ≥12	498	1.03	(0.86;1.23)	0.742
Serum Calcium:				
• <2.2	1918	0.98	(0.88;1.09)	0.736
• 2.2-<2.6 (ref*)	2751	1.00		
• ≥2.6	131	1.85	(1.38;2.48)	<0.001
Calcium Phosphate product:				
• <3.5	2711	1.49	(1.25;1.76)	<0.001
• 3.5-<4.5 (ref*)	1396	1.00		
• 4.5-<5.5	506	0.90	(0.73;1.12)	0.365
• ≥5.5	187	0.74	(0.50; 1.11)	0.145
Serum Phosphate:				
• <1.6 (ref*)	2832	1.00		
• 1.6-<2.0	1309	1.10	(0.93; 1.30)	0.274
• 2.0-<2.2	283	1.46	(1.09; 1.96)	0.012
• 2.2-<2.4	183	1.56	(1.09; 2.24)	0.017
• 2.4-<2.6	98	1.76	(1.12; 2.76)	0.015
• ≥2.6	95	2.60	(1.54; 4.38)	<0.001
Kt/V				
• <1.7	745	1.01	(0.89; 1.16)	0.839
• 1.7-2.0 (ref*)	969	1.00		
• ≤2	2079	0.99	(0.88; 1.10)	0.813
Assisted PD				
• Selfcare (ref*)	2555	1.00		
• Assisted	2127	1.37	(1.23; 1.53)	<0.001

Table 12.3.8: Reasons for Drop-out from PD program, 2001-2010

Year	2003		2004		2005		2006		2007		2008		2009		2010	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Death	195	77	156	60	182	61	177	58	230	66	277	64	320	65	317	65
Transplant	12	5	13	5	22	7	25	8	18	5	21	5	15	3	10	2
Peritonitis	15	6	38	15	29	10	33	11	36	10	50	11	76	15	75	15
Catheter related infection	0	0	5	2	2	1	2	1	4	1	4	1	11	2	13	3
Membrane failure	9	4	19	7	27	9	18	6	13	4	24	6	17	3	24	5
Technical problem	5	2	2	1	10	3	9	3	3	1	6	1	19	4	15	3
Patient preference	8	3	20	8	10	3	9	3	20	6	50	11	30	6	16	3
Others	7	3	9	3	7	2	16	5	14	4	2	0	3	1	16	3
Unknown	1	0	0	0	8	3	17	6	12	3	2	0	1	0	1	0
Total	252	100	262	100	297	100	306	100	350	100	436	100	492	100	487	100

SECTION 12.4: PERITONITIS

The median peritonitis rate for the year 2010 was 35.3 patient-months per episode (pt-month/epi) as shown in Table 12.4.1. There was a wide inter-centre variation with the highest and lowest rates of 10.8 and 84.9 patient-months per episode. Gram positive and gram negative organisms were each responsible for 29% of cases. Staphylococcus Aureus was the predominant organism (15%) amongst the gram positive bacteria. On the other hand, E. Coli emerged as the commonest gram negative organism (12%). The culture negative rate reduced to 30% compared to 36% in 2009 (Table 12.4.2). Fungal peritonitis remains at about 3% of all peritonitis cases. When comparing two eras of PD from 2001-2005 and 2006-2010 and outcomes by causative organisms, there is improvement in the proportion of cases achieving complete resolution and also less mortality. There is a higher tendency for catheter removal which may in part have accounted for the improved mortality rate. The exception was in mycobacterial peritonitis where there was a reduced catheter removal rate and slightly increased mortality in 2006-2010 compared with the previous era. This is most likely related to difficulty and delay in obtaining the diagnosis of mycobacterial peritonitis.

Table 12.4.1: Variation in peritonitis rate (pt-month/epi) among PD centres, 2001-2010

Year	Number of centres	Min	5 th Centile	LQ	Median	UQ	95 th Centile	Max
2001	11	10.8	10.8	19.9	23.6	41.3	60.3	60.3
2002	11	12.6	12.6	17.9	32.7	44.4	219.2	219.2
2003	13	18.2	18.2	21.3	32.9	39.6	312.1	312.1
2004	15	0	0	23.6	32.9	36.6	41.5	41.5
2005	15	18	18	26.3	35.6	43	57.7	57.7
2006	21	14.8	18.5	26.8	37.7	49.8	62.2	97.7
2007	23	12	12.9	30.7	42.1	56.6	68.4	106.7
2008	25	12	13	30	40.2	58.5	105.5	121.2
2009	25	14	17.1	29.8	38.2	55.8	115.7	245.8
2010	26	10.8	19.3	28.7	35.3	53.1	72.3	84.9

Figure 12.4.1: Variation in peritonitis rate among PD centres, 2010

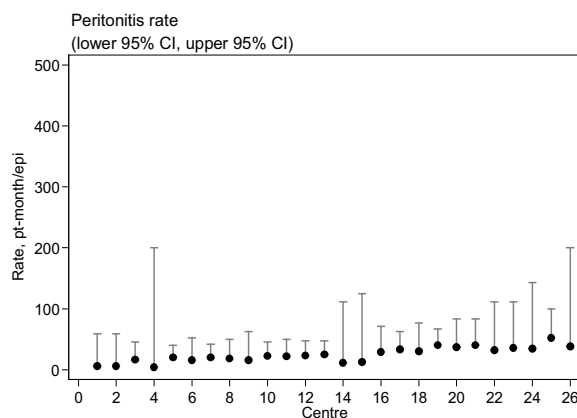


Table 12.4.2: Causative organism in PD peritonitis, 2001-2010

Microorganism	2001		2002		2003		2004		2005		2006		2007		2008		2009		2010		
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	
(A) Gram Positives																					
Staph. Aureus	40	13	62	17	45	12	52	14	39	12	51	14	47	13	46	10	53	11	75	15	
Staph Coagulase Neg.	30	10	39	11	47	13	41	11	42	13	32	9	29	8	49	11	51	10	54	11	
Strep	18	6	12	3	16	4	13	3	10	3	17	5	14	4	19	4	17	3	12	2	
Others	10	3	8	2	16	4	4	1	8	2	14	4	11	3	7	2	6	1	6	1	
(B) Gram Negatives																					
Pseudomonas	14	4	23	6	20	5	28	8	27	8	23	6	30	8	40	9	34	7	32	6	
Acinetobacter	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Klebsiella	7	2	18	5	27	7	25	7	21	7	8	2	21	6	20	4	17	3	9	2	
Enterobacter	16	5	11	3	13	4	19	5	19	6	20	5	17	5	23	5	27	6	31	6	
E.Coli	16	5	23	6	20	5	23	6	30	9	15	4	32	9	42	9	41	8	60	12	
Others	17	5	15	4	15	4	16	4	17	5	14	4	14	4	11	2	22	4	17	3	
(C) Polymicrobial	11	4	8	2	3	1	2	1	0	0	1	0	0	0	0	0	13	3	4	1	
(D) Others																					
Fungal	21	7	12	3	12	3	15	4	7	2	16	4	20	5	24	5	18	4	15	3	
Mycobacterium	4	1	1	0	3	1	4	1	2	1	4	1	1	0	4	1	1	0	0	0	
Others	9	3	11	3	12	3	8	2	3	1	10	3	12	3	21	5	16	3	33	7	
(E) No growth	99	32	118	33	115	32	123	33	96	30	142	39	122	33	160	34	174	36	147	30	
TOTAL	312	100	361	100	364	100	373	100	321	100	367	100	370	100	466	100	490	100	495	100	

Table 12.4.3(a): Outcome of peritonitis by Causative organism, 2001-2005

	Outcome							
	Resolved		Not resolved, catheter removed		Death		Total	
	n	%	n	%	n	%	n	%
(A) Gram Positives								
Staph. Aureus	94	42	22	10	108	48	224	100
Staph Coagulase Neg.	78	42	14	8	94	51	186	100
Strep	25	40	6	10	31	50	62	100
Others	19	48	3	8	18	45	40	100
(B) Gram Negatives								
Pseudomonas	26	24	26	24	56	52	108	100
Acinetobacter	0		0		0		0	-
Klebsiella	37	39	14	15	43	46	94	100
Enterobacter	22	30	11	15	41	55	74	100
E.Coli	37	35	23	21	47	44	107	100
Others	24	32	19	26	31	42	74	100
(C) Polymicrobial	4	17	5	21	15	63	24	100
(D) Others								
Fungal	1	2	41	62	24	36	66	100
Mycobacterium	0	0	7	50	7	50	14	100
Others	10	26	4	11	24	63	38	100
(E) No growth	199	39	61	12	256	50	516	100

Table 12.4.3(b): Outcome of peritonitis by Causative organism, 2006-2010

Causative Organism	Outcome							
	Resolved		Not resolved, catheter removed		Death		Total	
	n	%	n	%	n	%	n	%
(A) Gram Positives								
Staph. Aureus	128	49	50	19	82	32	260	100
Staph Coagulase Neg.	134	65	20	10	53	26	207	100
Strep	37	49	7	9	31	41	75	100
Others	15	36	4	10	23	55	42	100
(B) Gram Negatives								
Pseudomonas	34	23	60	41	51	35	145	100
Acinetobacter	0		0		0		0	-
Klebsiella	21	30	21	30	28	40	70	100
Enterobacter	46	40	28	25	40	35	114	100
E.Coli	84	46	29	16	69	38	182	100
Others	37	51	19	26	17	23	73	100
(C) Polymicrobial	3	18	9	53	5	29	17	100
(D) Others								
Fungal	5	5	57	62	30	33	92	100
Mycobacterium	0	0	4	40	6	60	10	100
Others	46	52	23	26	19	22	88	100
(E) No growth	370	52	107	15	238	33	715	100

Table 12.4.4: Risk factor influencing peritonitis rate, 2001 -2010

Factors	n	Risk Ratio	95% CI	P value
Age (years):				
• <15	294	0.86	(10.70; 1.05)	0.140
• 15-24	228	0.93	(0.78;1.10)	0.396
• 25-34 (ref*)	310	1.00		
• 35-44	437	1.11	(0.95;1.29)	0.201
• 45-54	752	1.02	(0.88;1.19)	0.784
• 55-64	828	1.05	(0.90;1.24)	0.514
• >=65	543	0.91	(0.76;1.09)	0.301
Gender:				
• Male (ref*)	1700	1.00		
• Female	1692	0.98	(0.91;1.06)	0.667
Diabetes:				
• No (ref*)	1876	1.00		
• Yes	1516	1.04	(0.95;1.14)	0.385
Income:				
• RM 0-999 (ref*)	1370	1.00		
• RM 1000-1999	1139	0.89	(0.81;0.97)	0.006
• RM 2000-2999	508	0.87	(0.78;0.98)	0.024
• >=3000	375	0.80	(0.70;0.93)	0.003
Education:				
• Nil	312	1.20	(1.03;1.39)	0.016
• Primary	1186	1.08	(0.99;1.18)	0.074
• Secondary (ref*)	1186	1.00		
• Tertiary	308	0.85	(0.73;0.99)	0.042
Assistance to perform CAPD:				
• Self care (ref*)	1945	1.00		
• Partially assisted	493	0.87	(0.77;0.98)	0.026
• Completely assisted	954	0.97	(0.87; 1.07)	0.501
Year vintage				
• 1 to < 2 (ref*)	1987	1.00		
• >2 to < 4	885	0.63	(0.58; 0.69)	0.000
• > 4	520	0.50	(0.45;0.55)	0.000