SECTION G PERITONEAL DIALYSIS

The number of prevalent adult patients treated by peritoneal dialysis (PD) has fallen progressively since 1999, see table B1.3. During the same time period the proportion of patients on automated PD (APD) has increased. These data exclude children on PD who are treated primarily by APD rather than CAPD.

Prospective audit data of the incidence of episodes of PD associated peritonitis, adequacy of dialysis and causes of PD technique failure are reported to the Scottish Renal Registry (SRR) by all adult renal units in Scotland every 6 months.

During 2014 a total of 122 adult patients started PD: 84 incident patients, 28 transfers from HD, 4 transfers from other units outside of Scotland and 6 patients after failure of a kidney transplant. A total of 129 adult patients discontinued PD: 66 transfers to HD, 2 transfers to other units, 33 transplants and 28 deaths.

G1 Reasons for starting and stopping PD in adult renal units 2010-2014

Renal unit	New	From HD	Transfer in	From Tx	Total in	Death	To Tx	To HD	Transfer out	Re-covered	Total out
ARI	51	22	4	7	**84**	7	23	51	1	0	**82**
XH	58	17	1	1	**77**	30	17	27	0	2	**76**
DGRI	32	3	4	0	**39**	9	7	19	1	0	**36**
GLAS	93	42	4	9	**148**	33	41	88	3	1	**166**
MONK	33	7	2	2	**44**	5	12	32	1	1	**51**
NINE	33	23	0	4	**60**	6	17	41	1	2	**67**
RAIG	31	22	1	2	**56**	8	13	37	2	2	**62**
RIE	56	23	6	5	**90**	25	31	62	0	2	**120**
VHK	32	11	1	1	**45**	10	6	36	0	0	**52**
Total	**419**	**170**	**23**	**31**	**643**	**133**	**167**	**393**	**9**	**10**	**712**

The standard definition of PD associated peritonitis used by the SRR can be found on the SRR website:

http://www.srr.scot.nhs.uk/Projects/Projects3.html#periton

Recurrent episodes of peritonitis, defined as peritonitis within 4 weeks of stopping antibiotics, are included as separate episodes of peritonitis throughout the audit period.

There were 107 episodes of peritonitis in 2586 patient months on PD in 2014. Comparison with peritonitis rates in earlier years is shown in G2.

G2 PD associated peritonitis rates in adult renal units 2000-2014								
	2000-2007	2008	2009	2010	2011	2012	2013	2014
Months between episodes of peritonitis	19.9	18.5	18.7	18.8	23.4	27.0	22.1	24.2

G3 PD associated peritonitis rates in adult renal units 2010-2014			
Unit	No of episodes of peritonitis	Total patient months on PD	Peritonitis rate (months between episodes)
ARI	75	1606	21.4
XH	73	2584	35.4
DGRI	29	787	27.1
GLAS	142	2886	20.3
MONK	23	620	27.0
NINE	40	1275	31.9
RAIG	59	1054	17.9
RIE	137	2362	17.2
VHK	71	1372	19.3
SCOTLAND	**649**	**14547**	**22.4**

There is wide variance in peritonitis rates among renal units.

RAIG and RIE have peritonitis rates across the five years worse than the minimum standard set by the Renal Association (< 1 episode per 18 months).

G4 Rate (PD treatment months between episodes) of causative organisms of PD peritonitis in adult renal units 2010-2014							
Renal unit	Causative Organism						Total Rate
	Staph Aureus	Coagulase negative Staph	Gram negative bacilli	Fungi	Other	Culture negative	
ARI	0.0	84.5	133.9	1606.4	89.2	64.3	21.4
XH	430.7	172.3	215.3	0.0	198.8	95.7	35.4
DGRI	262.3	65.6	131.2	0.0	196.8	196.8	27.1
GLAS	192.4	80.2	87.5	577.2	93.1	131.2	20.3
MONK	56.4	310.4	0.0	206.9	310.4	124.2	27.0
NINE	212.5	115.9	141.7	637.6	127.5	637.6	31.9
RAIG	175.7	75.3	65.9	0.0	58.6	210.8	17.9
RIE	181.7	44.6	168.7	1181.0	57.6	168.7	17.2
VHK	105.5	59.7	91.5	274.4	137.2	274.4	19.3
Average rate	**199.3**	**78.6**	**124.3**	**808.2**	**99.0**	**133.5**	**22.4**

The distribution of causative organisms of PD related peritonitis in adult renal units 2010-2014 is expressed a rate of treatment months between episodes.

The spectrum of causative organisms is similar to historical reports and those from other regional and national registries.

The culture negative peritonitis rate in 2014 improved to 16.9% from 18.4% in 2013.

G5	Number of patients with total (peritoneal and renal) creatinine clearances (Litres/week/1.73m^2) in each 6 month audit period 2010-2014 and percentage of PD patients with inadequate (<50) and borderline (50-60) creatinine clearance							
Year	Adequacy						% < 50	% 50-60
	< 50	50-60	61-70	>70	Unassessed	Total		
2010a*	18	38	33	123	61	273	**6.6**	**13.9**
2010b*	25	37	31	107	70	270	**9.3**	**13.7**
2011a	22	30	37	110	48	247	**8.9**	**12.1**
2011b	23	35	32	98	61	249	**9.2**	**14.1**
2012a	24	37	26	94	54	235	**10.2**	**15.7**
2012b	25	24	34	103	45	231	**10.8**	**10.4**
2013a	16	30	33	92	112	283	**5.7**	**10.6**
2013b	23	31	34	84	52	224	**10.3**	**13.8**
2014a	25	29	27	79	44	204	**12.3**	**14.2**
2014b	25	26	30	88	34	206	**12.1**	**14.1**
Total	**226**	**320**	**317**	**978**	**581**	**2422**	**9.3**	**13.2**

* a refers to first 6 months and b refers to second 6 months of each year

The absolute number of PD patients with inadequate small solute clearances (total creatinine clearance < 50 Litres/week/1.73m^2) and borderline small solute clearances (total creatinine clearance 50-60 Litres/week/1.73m^2) remained relatively constant as the total number of PD patients decreased from 2010 to 2014.

Patients who did not have adequacy of PD assessed either were within 2 months of starting PD or had significant residual renal function and so were considered very unlikely to have inadequate dialysis.

At the end of each 6 month audit period in the 5 years 2010-2014 on average 9.3% of patients on PD had a total creatinine clearance < 50 Litres/week/1.73m^2 and 13.2% had a total creatinine clearance 50-60 Litres/week/1.73m^2 indicating that these patients had either inadequate or borderline dialysis adequacy.

G6 Causes of technique failure and end of year prevalence of inadequate dialysis in adult renal units 2010-2014				
Year	No. of PD patients transferred to HD	n (%) patients with peritonitis as cause of technique failure	n (%) patients with under-dialysis as cause of technique failure	% of PD patients at end of year with total creatinine clearance < 50/L/1.73m^2/ week
2010	93	35 **(38)**	15 **(16)**	**9.2**
2011	85	33 **(39)**	27 **(32)**	**9.2**
2012	65	20 **(31)**	18 **(28)**	**10.7**
2013	83	36 **(43)**	15 **(18)**	**10.3**
2014	66	25 **(37)**	15 **(22)**	**12.2**

12.2% of the 206 patients on PD at the end of December 2014 had a most recent total creatinine clearance < 50/L/week/1.73m^2 and will be at risk of technique failure due to underdialysis in 2015.

G7 Causes of PD technique failure in each adult renal 2010-2014								
Renal unit	Peritonitis	Access	Under-dialysis	Poor UF*	High IP**	Wish HD	Stop Dialysis	Total
ARI	16	2	19	3	6	5	2	53
XH	6	3	5	3	3	6	1	27
DGRI	4	0	7	2	1	2	1	17
GLAS	34	8	18	4	12	11	2	89
MONK	20	2	2	7	1	1	0	41
NINE	17	4	10	2	3	4	1	41
RAIG	15	4	3	0	4	6	1	33
RIE	24	10	16	3	3	8	1	65
VHK	13	4	11	2	3	3	0	36
Total	**149**	**37**	**91**	**26**	**36**	**46**	**9**	**394**

* Poor ultrafiltration
** High intraperitoneal pressure

Despite the higher peritonitis rates in some units there was no association between the incidence of peritonitis and the proportion of patients stopping PD who had peritonitis as the attributed cause of technique failure.