

SECTION E PERITONEAL DIALYSIS

The number of prevalent adult patients on peritoneal dialysis (PD) has fallen progressively from 424 at the end of 1999 to 224 at the end of 2013. During the same time period the proportion of patients on APD has increased from 28% to 75%. 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 2013 a total of 137 adult patients started PD: 80 incident patients, 40 transfers from HD, 8 transfers from units outside of Scotland and 9 patients after failure of a kidney transplant. A total of 149 adult patients discontinued PD: 83 transfers to HD, 2 transfers to other units, 33 transplants, 30 deaths and 1 patient recovered renal function to become independent of dialysis.

E1 Reasons for starting and stopping PD in adult renal units 2009-2013											
Renal unit	New	From HD	Transfer in	From Tx	Total in	Death	To Tx	To HD	Transfer out	Re-covered	Total out
ARI	52	18	3	5	78	5	29	49	3	1	87
XH	57	20	1	2	80	30	18	27	-	2	77
DGRI	25	4	2	-	31	8	9	14	-	-	31
GLAS	92	51	5	10	158	35	45	92	4	1	177
MONK	40	3	1	2	46	4	10	31	-	1	46
NINE	28	31	2	5	66	6	18	44	2	2	72
RAIG	28	20	1	-	49	7	11	39	2	3	62
RIE	60	31	7	8	106	29	35	81	2	2	149
VHK	32	15	1	2	50	12	7	37	-	1	57
Total	414	193	23	34	664	136	182	414	13	13	758

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>

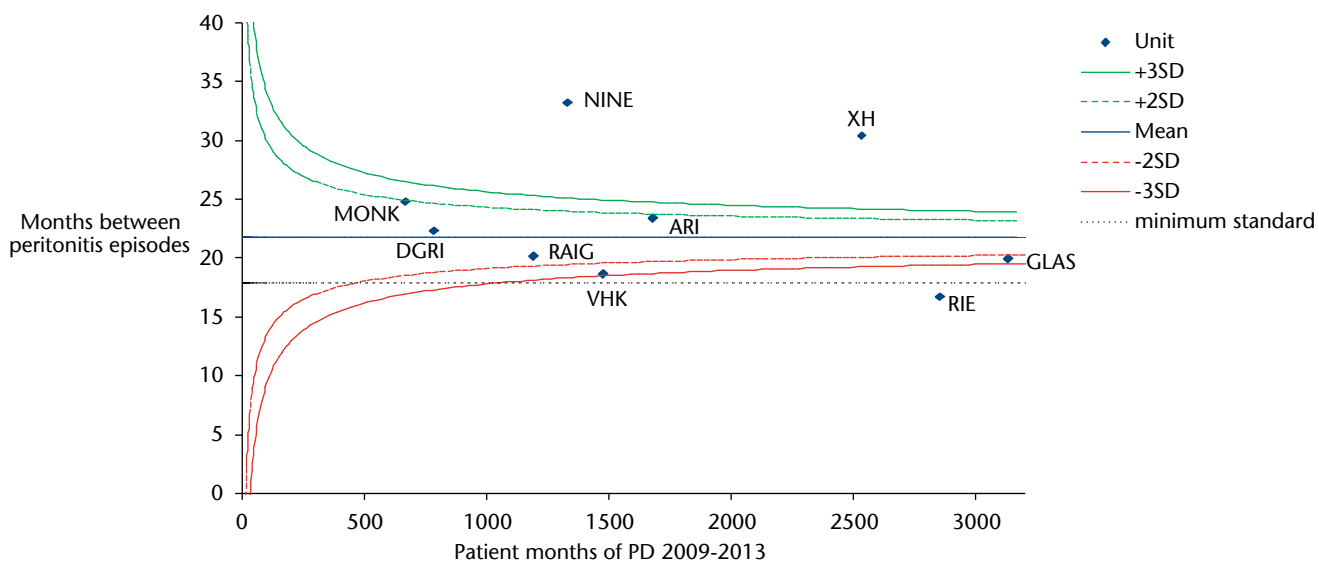
Recurrent episodes of peritonitis, defined as peritonitis within 4 weeks of stopping antibiotics, are included as separate episodes of peritonitis throughout the audit period.

There were 125 episodes of peritonitis in 2768 patient months on PD in 2013. Comparison with peritonitis rates in earlier years is shown in E2.

E2 PD associated peritonitis rates in adult renal units 2000-2013

	2000-2007	2008	2009	2010	2011	2012	2013
Months between episodes of peritonitis	19.9	18.5	18.7	18.8	23.4	27.0	22.1

E3 PD associated peritonitis rates in adult renal units 2009-2013



There is wide variance in peritonitis rates among renal units.

Two units, XH and NINE, have time periods between peritonitis episodes more than 3SD above the mean. One unit, RIE, has time between peritonitis episodes more than 3SD below the mean and has a peritonitis rate across the five years worse than the minimum standard set by the UK Renal Association.

E4 Causative organisms of PD peritonitis in adult renal units 2009-2013								
Renal unit	Causative Organism						Total No. of episodes	Total PD months
	Staph Aureus	Coagulase negative Staph	Gram negative bacilli	Fungi	Other	Culture negative		
ARI	-	19	7	1	20	25	72	1682
XH	10	20	11	2	18	22	83	2533
DGRI	4	14	7	-	4	6	35	785
GLAS	17	45	31	5	31	28	157	3134
MONK	9	4	-	3	3	5	24	669
NINE	8	8	10	2	10	2	40	1333
RAIG	5	12	17	1	19	5	59	1192
RIE	21	67	14	2	45	21	170	2854
VHK	16	25	14	6	12	6	79	1477
Total	90	214	111	22	162	120	719	15659

The spectrum of causative organisms was similar to earlier reports and reports from other regional and national registries. The culture negative peritonitis rate in 2013 remained relatively high at 18.4%.

E5 Total (peritoneal and renal) creatinine clearances (Litres/week/1.73m ²) in each 6 month audit period 2009-2013 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		
2009a*	18	35	60	136	58	306	5.9	11.4
2009b*	14	36	45	121	70	286	4.9	12.6
2010a	18	38	33	123	61	275	6.5	13.8
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	233	10.7	10.3
2013a	16	30	33	92	112	225	7.1	13.3
2013b	23	31	34	84	52	224	10.3	13.8

* 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/1.73m²) and borderline small solute clearances (total creatinine clearance 50-60 Litres/week/1.73m²) remained relatively constant as the total number of PD patients decreased from 2009 to 2013. At the end of each 6 month audit period on average 8.2% of patients on PD had a total creatinine clearance < 50 Litres/week/1.73m² and 13.1% had a total creatinine clearance 50-60 Litres/week/1.73m².

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.

E6 Causes of technique failure and end of year prevalence of inadequate dialysis in adult renal units 2009-2013						
Year	PD patients transferred to HD	Patients with peritonitis as cause of technique failure		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
		n	%	n	%	
2009	87	33	38	18	21	4.9
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

10.3% of the 224 patients on PD at the end of December 2013 had a most recent total creatinine clearance < 50/L/week/1.73m² and will be at risk of technique failure due to under dialysis in 2014.

E7 Causes of PD technique failure in each adult renal 2009-2013								
Renal unit	Peritonitis	Access failure	Under-dialysis	Poor UF*	High IP**	Wish HD	Stop Dialysis	Total
ARI	15	4	16	3	6	4	1	49
XH	9	1	5	3	2	6	1	27
DGRI	4	-	5	2	1	1	1	14
GLAS	31	10	18	8	10	14	1	92
MONK	18	4	1	6	1	1	-	31
NINE	18	5	11	-	4	5	1	44
RAIG	19	4	6	-	4	5	1	39
RIE	28	18	22	2	3	6	2	81
VHK	15	4	10	2	3	3	-	37
Total	157	50	94	26	34	45	8	414

* 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.