

Chapter 3: The 1999 UK Renal Survey - adult patient numbers, renal unit facilities and processes of care

A survey to document the provision of renal care in the United Kingdom to the end of 1998 was commissioned and funded by the Department of Health and was conducted in collaboration with the UK Renal Registry.

This is the first survey of the provision of Renal Replacement Therapy (RRT) throughout the whole UK. Data were obtained from all the renal units functioning on 31/12/98. The survey complements the data from the Renal Registry. The Registry provides indicative information on treatment rates in the UK, albeit from only a sample of the population, but it does not provide detailed information on the facilities available to provide renal replacement therapy.

In the UK, the cost of RRT consumes 2% of the NHS budget and this is predicted to reach 3% within five years. In the USA, the annual cost is estimated to be in excess of \$15 billion¹. For health care planning purposes it is clearly important to have a clear understanding of changes in this high cost therapy, and to ensure that there is equity of access to care throughout the UK. Hence this further review of RRT in the UK was commissioned.

During the last ten years there has been a continuing substantial increase in the number of patients receiving Renal Replacement Therapy (RRT) in the UK. The 1993 National Renal Review returned a figure for England of 396 people per million population (p.m.p.)²; the report of 1995 returned 476 p.m.p.³, and the number is currently estimated to be over 520 p.m.p.⁴ Similar trends have been observed in Wales⁴ and Scotland⁵. Prevalence in the USA is 909 p.m.p.¹ The acceptance rate of new patients requiring RRT is rising throughout the world: in the UK there has been more than a four-fold increase since 1980³.

As patient numbers increase, facilities for renal care will have to change in both volume and pattern of provision. Earlier surveys^{2,3} showed the proportion of patients on haemodialysis to be increasing, and that the number of main renal units remained stable between 1993 and 1995. There was an increase in the haemodialysis treatment shifts, number of permanent dialysis stations, and temporary haemodialysis stations, and a major increase of satellite units.

The demographic data from the UK Renal Registry was compared with the data from this survey of 100% of renal units to assess how representative the Registry is of the UK as a whole.

Methods

A questionnaire was sent to all adult renal units in the United Kingdom. Scotland and Northern Ireland were included in the survey for the first time. Information was sought on numbers and grades of medical and nursing staff, structure of care, some key processes of treatment including bicarbonate dialysis and disconnect catheter for peritoneal dialysis), numbers of prevalent patients (stock) at the end of 1998, new patients accepted on to RRT 1996-98, and the number of transplants performed 1996-98. Information was also sought on the number of patients on erythropoietin treatment and the number of patients on RRT who were Hepatitis B and Hepatitis C positive.

The questionnaires were first distributed in January 1999. Initial responses were slow and patchy and it was necessary to resend the questionnaire to many units. In over half the units, missing items of data, especially on details of staffing, were obtained by subsequent telephone contacts which were often multiple. Two units needed a site visit in order to obtain the data. The final validated data were not complete until August 2000. Eventually data were obtained from all the 71 identified renal units in the U.K.

The data were entered onto an Excel spreadsheet and analysed using this and SAS software. The office for National Statistics (ONS) mid-year population estimates for England and Wales and the mid-year population estimates published by the Registrar General for Scotland were used to calculate the population denominators for the acceptance and prevalence per million population rates. 95% confidence intervals are shown for the acceptance rates, prevalence rates and some of the process measures. To determine whether the variations in acceptance and prevalence rates were statistically significant between England, Wales, Scotland and Northern Ireland, Poisson regression analysis was used.

Consultant staff Whole Time Equivalent (WTE) were based on the total number of sessions divided by a weighted average of total sessions reported. Renal unit directors were telephoned and asked the number of sessions of each consultant dedicated to nephrology. WTE estimations were not made for junior medical staff.

Data were compared with those collected for the 1993 National Renal Review, and 1995 national survey and with data obtained by the UK Renal Registry and the Scottish Renal Registry. Any discrepancies with data held by the registries were carefully investigated in what proved to be a useful validation process.

Individual unit's responses are shown by region in the appendix.

New patients starting renal replacement therapy

The acceptance rate for new adult patients in the UK is 96 per million population and the data are shown in Table 3.1. There was a significant variation between the acceptance rates pmp in England, Wales, Scotland and N. Ireland ($p < 0.0001$, Poisson regression) with the rate lowest in England at 92 p.m.p. Given the larger ethnic minority population in England a higher rate would have been expected, suggesting there may be unmet need there. The acceptance rate is progressively rising (table 2), as is the proportion of new patients who are over 65 years of age (47%) or diabetic (19%)

	England	Wales	Scotland	N. Ireland	Total UK
No of renal units	52	5	11	3	71
Patient numbers	4,566	374	536	181	5,657
Unit median (range)	79 (28-228)	49 (35-147)	53 (19-86)	N/A	70 (19-228)
Acceptance rate pmp (95% CI)	92 (90-95)	128 (115-141)	105 (96-114)	107 (92-124)	96 (93-98)

Table 3.1 Acceptance data for new patients accepted onto RRT in 1998

Changes in acceptance rates in England and Wales 1993-1998

The acceptance rates in the UK have steadily risen as is shown in Tables 3.2 and 3.3.

Acceptance data:	England	Wales	Scotland*
1991/2 patient numbers	3,247	-	317
1991/2 rate pmp	67	-	62
Unit median (range)	60 (15-138)	-	-
No. of units with complete data	52	-	11
1993 patient numbers	3,197	275	404
1993 rate pmp	73	95	79
Unit median (range)	64 (7-158)	25 (21-134)	-
No. of units with complete data	46	5	11
1994 patient numbers	3,371	308	388
1994 rate pmp	77	106	76
Unit median (range)	63 (4-169)	29 (20-142)	-
No. of units with complete data	47	5	11
1995 patient numbers	3,726	318	445
1995 rate pmp	82	109	87
Unit median (range)	72 (11-163)	27 (20-152)	-
No. of units with complete data	49	5	11
1998 patient numbers	4,566	374	536
1998 rate pmp	92	128	105
Unit median (range)	79 (28-228)	49 (35-147)	53 (19-86)
No of renal units	52	5	11

* Pre 1998 data from Scottish renal registry

Table 3.2 Acceptance rate for new patients on RRT 1993-1998 in the UK

In the 1993 National Renal Review the annual acceptance rate for 1991/2 was quoted originally as 65 p.m.p rather than the rate quoted above at 67 p.m.p. In the 1993 review, individual patient data were used to produce the acceptance rates; all patients not resident in England (including Welsh & Scottish patients), under 16s, and duplicate records were excluded.

	% over 65	% diabetic
1976-78 (UK)	1	2
1982-84 (UK)	11	8
1986-88 (UK)	23	12
1991-92 (England)	37	14
1995 (England and Wales)	39	15
1998 (UK)	47	19

Sources: EDTA 1976-1988, National Renal Surveys 1991-1998

Table 3.3 Changing profile of patients accepted onto RRT in the UK

Prevalent patients receiving renal replacement therapy 31/12/98

The UK is now treating over 30,000 patients with end stage renal failure, at a rate of 526 per million population (table 3.4). There was significant variation between the prevalence rates p.m.p. in England, Scotland, Wales and Northern Ireland ($p < 0.0001$, Poisson regression). England has a significantly lower rate than either Wales or Scotland. The quoted prevalence for Scotland is marginally lower than that quoted in the Scottish Renal Registry report. The Scottish Registry figures included paediatric patients.

	England 1998	Wales 1998	Scotland 1998	N. Ireland 1998	Total UK 1998
No. of units	52	5	11	3	71
Patient numbers	25,892	1,716	2,798	741	31,147
Rate pmp (95% CI)	523 (517-530)	585 (558-613)	546 (526-567)	439 (408-472)	526 (520-532)
Haemodialysis	7,788 (30%)	451 (26%)	976 (35%)	356 (48%)	9,571 (31%)
Home haemodialysis	516 (2%)	17 (1%)	69 (2%)	0	602 (2%)
Peritoneal dialysis	5,101 (20%)	301 (18%)	441 (16%)	84 (11%)	5,927 (19%)
Transplants	12,487 (48%)	947 (55%)	1,312 (47%)	301 (41%)	15,047 (48%)
Total patients	25,892	1,716	2,798	741	31,147

Table 3.4 UK Patients receiving Renal Replacement Therapy – Dec 31 1998

The predominant modality of dialysis is hospital-based haemodialysis. The proportions of haemodialysis to peritoneal dialysis patients are similar in England and Wales, but in Scotland and Northern Ireland there is a considerably greater use of haemodialysis therapy.

Changes in prevalence 1993-1998

The changes in the numbers and distribution of prevalent patients in England from 1993 to 1998 and in Wales from 1995 to 1998 are shown in Table 3.5. The trend in England is also illustrated in Figure 3.1. The general pattern is for the greatest absolute and proportional increase to be in unit based haemodialysis (including satellite unit dialysis). Whilst the numbers transplanted and on PD continue to rise, the growth is much less than in haemodialysis, producing proportional falls in these modalities. The proportion of transplant patients in Wales appears to be rising, even in the face of the high acceptance rate for renal replacement therapy.

	England 1993	England corrected 1995	England 1998	Wales 1995	Wales 1998
No. of units	52	51	52	5	5
Patient numbers	19,212	22,322*	25,892	1,560	1,716
Rate pmp	396	458	523	535	585
Haemodialysis	3,899 (20%)	5,383(24%)	7,788 (30%)	388 (27%)	451 (26%)
Home haemodialysis	806 (4%)	725 (3%)	516 (2%)	33 (2%)	17 (1%)
Peritoneal dialysis	4,340 (23%)	4,880(22%)	5101 (20%)	314 (22%)	301 (18%)
Transplants	10,167 (53%)	11,334 (51%)**	12,487 (48%)	685 (48%)	947 (55%)
Total patients	19,212	22,322	25,892	1,420	1,716

* Includes estimated data from the two missing units in England.

** Error in transplant data 1995 corrected from 1995 national review.

Table 3.5 Patients receiving RRT in England (1993-1998) & Wales (1995-98)

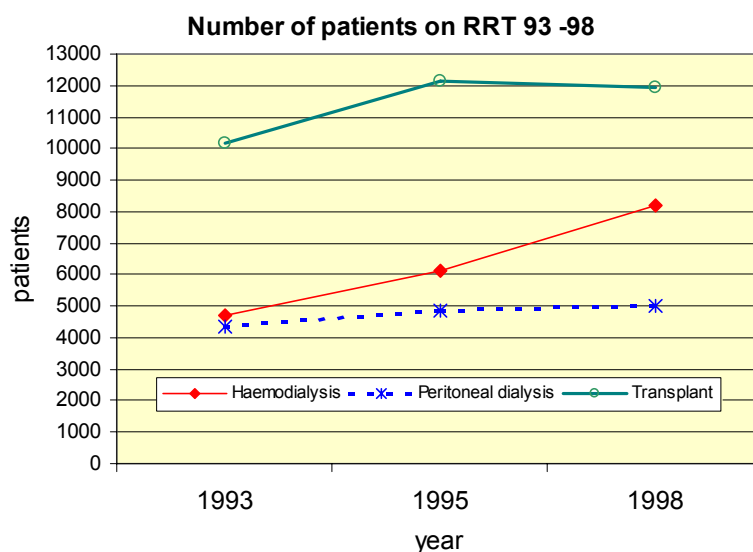


Figure 3.1 Number of patients on each modality - England 1993-98

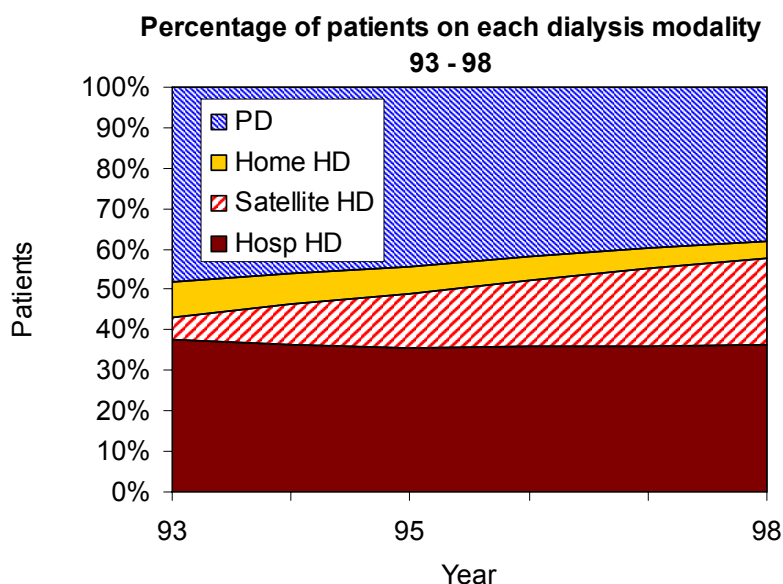


Figure 3.2 Change in patients on dialysis modality 93-98

The area of greatest proportional growth is satellite-based haemodialysis (Figure 3.2). 36% of haemodialysis stations and 31% of haemodialysis patients are now in satellite units.

Renal unit facilities

Renal unit facilities at the end of 1998 are summarised in Table 3.6. "Temporary" haemodialysis stations were defined as stations which were not part of an agreed establishment with the commissioners, but had been temporarily created to deal with excessive patient loads. These were usually in in-patient areas. 5% of haemodialysis was carried out in such facilities although there were no temporary stations in Wales. Of permanent haemodialysis stations, 38% were in satellite units. The large variation in patterns

of care is illustrated by wide variation in the number of haemodialysis stations per renal unit (6-55) or satellite unit (2-41) (Tables 3.6 and 3.7).

	England	Wales	Scotland	N. Ireland	Total UK
Main renal units	52	5	11	3	71
Units per million population	1.1	1.7	2.1	1.8	1.2
Total beds	1,210	93	195	44	1,542
Unit no of beds median (range)	22 (0-64)	15 (0-38)	17 (0-35)	16 (4-24)	22 (0-64)
Beds per million population	24	32	38	26	26
Haemodialysis					
Unit no of fixed stations median (range)	19 (7-55)	16 (10-23)	18 (9-39)	16 (6-40)	18 (6-55)
Fixed stations	1021	83	210	62	1376
Satellite stations (proportion of satellite to total number of stations)	761 (40%)	47 (36%)	24 (9%)	10 (14%)	842 (36%)
Temporary stations	108	0	13	2	123
Total HD stations	1,890	130	247	74	2,341
Stations per million population	38	44	48	44	40
Ratio Hospital: Satellite stations	1.5:1	1.8:1	9.3:1	6.4:1	1.8:1
HD shifts / week	891	69	175	48	1,183
Unit median (range)	18 (12-24)	12 (12-18)	18 (12-19)	18 (12-18)	18 (12-24)

Table 3.6 Renal unit facilities in the UK – 31/12/1998

Satellite units:	England	Wales	Scotland	N. Ireland	Total UK
Current satellites	73	4	5	1	83
No. units with current satellites	36	2	3	1	42
range per renal unit	0-5	0-3	0-2	0-1	0-5
Planned new satellites	28	2	5	0	35
No. Units with planned satellites	25	2	4	0	31
No. of units without satellites planning to start a satellite centre	7	1	3	0	11
Total patients in satellite units	2,847	194	102	39	3,182
Median per satellite (range)	35 (6-160)	49 (36-60)	16 (3-52)	39	36 (3-160)
Total HD stations in satellite unit	761	47	24	10	842
Median per satellite (range)	8 (3-41)	13(9-13)	4 (2-9)	10	9 (2-41)

Table 3.7 Satellite dialysis units in the UK – 31/12/1998

Changes in renal facilities in England and Wales 1993-1998

Despite the large growth in patient numbers there has been no increase in the number of renal units in England and Wales between 1993 –1998 (Table 3.7). The number of renal units per million population is lower in England (1.1) than in Scotland (2.1), Wales (1.7) or Northern Ireland (1.8) (Table 3.6). The expansion in patient numbers has been accommodated by increasing the number of haemodialysis stations available within main renal units (from 932 stations in 1993 to 1890 stations in 1998) and the number of shifts worked. In England and Wales there has also been a massive expansion of satellite unit provision accounting for 35%

of haemodialysis, with an expansion both in the numbers (8%) and size (75% increase in number of stations) since 1995 (Tables 3.7, 3.8, 3.9).

	England 1993	England 1995	England 1998	Wales 1995	Wales 1998
Main renal units	52	51*	52	5	5
Total HD stations	932	1,423	1,890	97	130
Unit no fixed of stations median (range)	15 (3-55)	23 (7-86)	19 (7-55)	13 (10-35)	16 (10-23)
Fixed stations	743	832	1021	65	83
Satellite stations	189	472	761	28	47
Temporary stations	N/A	119	108	4	0
HD shifts / week	694	856	891	62	69
Unit median (range)	12 (0-31)	18 (8-35)	18 (12-24)	16 (12-18)	12 (12-18)

* Facilities data based on returns from 50 renal units with 2 unit missing

Table 3.8 Changes in renal unit facilities in England 1993-98 and Wales 1995-98

Satellite units:	England 1993	England 1995	England 1998	Wales 1995	Wales 1998
Current satellites	36	60	73	3	4
No. units with satellites	17	30	36	2	2
range per unit	1-6	1-5	1-5	1-2	1-3
Planned satellites	14	37	28	5	2
No. units with planned satellites	9	28	25	5	2
No. of planned satellites where unit has no existing satellites	5	8	7	1	1
Total patients in satellite units	476	1476	2,847	64	194
Median per satellite (range)	15 (1-41)	24 (1-68)	35 (6-160)	32 (25-39)	49 (36-60)
Total HD stations in satellite unit	189	472	761	28	47
Median per satellite (range)	6 (2-10)	7 (2-31)	8 (3-41)	8 (6-14)	13 (9-13)

Table 3.9 Changes in satellite haemodialysis provision in England & Wales

In England whilst the number of haemodialysis patients has doubled, there has been no increase in the number of renal units, they have simply become larger, by nearly 40%. The number of satellite units has doubled in England between 1993 and 1995 with a trebling of the number of haemodialysis stations available in them.

Staffing in renal units

Details of staffing in renal units are shown in Tables 3.10, 3.11 and 3.12. Relating the changes in whole time equivalent (WTE) staffing in England to the changes in patient numbers, there has been very little change in the ratio of renal replacement therapy patients or dialysis patients per consultant nephrologist. The ratio of one consultant nephrologist per 70 dialysis patients has remained unchanged in England since 1993. Northern Ireland had one nephrology consultant WTE per 55 dialysis patients whereas Scotland (82), England (95) and Wales (113) had less number of consultants WTE per dialysis patient. Scotland had a higher

ratio of trained to untrained nursing staff (7.2) than England (2.6) and Wales (2.5). We also observed a higher proportion of non-consultant grade physicians in Wales.

	England	Scotland	Wales	N. Ireland	UK
	1998	1998	1998	1998	1998
Consultant nephrologists:					
Numbers	192	33	12	9	246
Number p.m.p.	3.9	6.4	4.1	5.3	4.2
No. of units	52	11	5	3	71
Average per unit	3.7	3.0	2.4	3	3.5
WTE nephrology*	139.7	18.1	6.8	7.9	172.5
WTE p.m.p.	2.8	3.5	2.3	4.7	2.9
Transplant surgeons:					
Numbers	69	12	3	1	85
Number p.m.p.	1.4	2.3	1.0	0.6	1.4
No. of units	24	3	1	1	31
WTE transplant surgeons**	35.8	3.5	2.1	1.1	42.5
WTE p.m.p.	0.7	0.7	0.7	0.7	0.7
Associate specialists:					
Staff Grade	13	1	5	0	19
Clinical Assistants	18	8	1	0	27
Senior Registrars/Lecturers	7	0	2	0	9
Clinical Research Fellows	9	1	0	1	11
Registrars/Lecturers	49	8	0	2	59
Senior house officers	117	15	8	2	142
House officers	144	25	11	6	186
	35	4	3	3	45

* renal units varied in the number of sessions included in a full time week - 10.64 sessions was taken as the weighted average.

** transplant units varied in the number of sessions included in a full time week -10.43 sessions was taken as the weighted average.

Table 3.10 Medical staffing in renal units in the UK 1998

	England	Scotland	Wales	N. Ireland	UK
Nursing Staff:					
WTE	1555.6	422	74.8	87.4	2139.8
WTE per million population	31	82	26	52	36
No. of units	52	11	5	3	71
Median (range)	22 (9.5-142.8)	3 (10.7-108)	14 (11-20.8)	15 (11-61.4)	21.6 (9.2-142.8)
% of nurses with ENB qualification	53%	NA	49%	46%	52%
Ratio of nurses to main unit HD patients	0.3	0.5	0.3	0.3	0.5
Ratio of nurses to non nursing trained staff	2.6	7.2	2.5	4.6	3
Non nursing trained staff:					
WTE	606.6	58.5	30	19	714.1
WTE per million population	12	11	10	11	12
No. of units	52	11	5	3	71
Median (range)	8.2 (0-76.9)	5.8 (0-12)	5 (3-10)	5.8 (0-12)	8 (0-76.9)

	England	Scotland	Wales	N. Ireland	UK
Dieticians numbers WTE	88.4	14.3	5.5	4.2	112.4
No. of units	52	11	5	3	71
Average per unit	1.7	1.3	1.1	1.4	1.6
Social workers numbers WTE	42.6	5.4	3.8	3.1	54.9
No. of units	52	11	5	3	71
Average per unit	0.8	0.5	0.8	1	0.8
Technicians numbers WTE	150	21.5	8	8.3	187.8
No. of units	52	11	5	3	71
Average per unit	2.9	2	1.6	2.8	2.6

Table 3.11 Professions allied to medicine staffing in the UK 31/12/1998

Changes in staffing in England and Wales 1993-1998

	England 1993	England 1995	England 1998	Wales 1995	Wales 1998
Consultant nephrologists:					
Numbers	129	151	192	11	12
No. of units	52	50	52	5	5
Average per unit	2.5	3.0	3.7	2.2	2.4
WTE nephrology*	-	98.4	139.7	5.5	6.8
Transplant surgeons:					
Numbers	60	55	69	2	3
No. of units	28	24	24	1	1
WTE transplant surgeons ^s	-	24.4	35.8	1.4	2.1
Associate specialists	8	9	13	3	5
Staff Grade	8	15	18	2	1
Clinical Assistants	13	13	7	5	2
Senior Registrars/Lecturers	37	36	9	2	0
Clinical Research Fellows	25	35	49	0	0
Registrars/Lecturers	62	70	117	4	8
SHOs	122	131	144	10	11
HO	29	27	35	2	3
Dieticians numbers WTE	-	70.5	88.4	5	5.5
No. of units	-	49	52	5	5
Average per unit	-	1.4	1.7	1	1.1
Social workers numbers WTE	-	32.9	42.6	2.7	3.8
No. of units	-	49	52	5	5
Average per unit	-	0.7	0.8	2.7	0.8
Technicians numbers WTE	-	156.5	150	11	8
No. of units	-	49	52	5	5
Average per unit	-	3.2	2.9	2.2	1.6

* Units varied in the number of sessions included in a week - 10.65 sessions was taken as the weighted average for 1995 and 10.64 for 1998.

** Transplant units varied in the number of sessions included in a week -10.62 sessions was taken as the weighted average for 1995 and 10.43 for 1998.

Table 3.12 Changes in staffing in renal units in England & Wales 1993-8

Processes of care

Some information on processes of care is listed in Tables 3.13-3.15. A large number of haemodialysis patients in Northern Ireland are still retained on twice weekly dialysis. The reasons for this are not clear. As reported in many other studies haemodialysis patients are more likely to need erythropoietin than peritoneal dialysis patients.

	England	Scotland	Wales	N. Ireland	UK
Process measures	1998	1998	1998	1998	1998
% of dialysis patients on hospital/satellite HD	58%	66%	59%	83%	59%
Unit median (range)	58% (30-100%)	67% (40-77%)	62% (56-69%)	N/A	61% (30-100%)
Units	52	11	5	3	71
% of HD patients on bicarbonate	99.6%	100%	98%	100%	99.6%
Unit median (range)	100% (90-100%)	100% (100-100%)	100% (94-100%)	N/A	100%(90-100%)
Units	52	11	5	3	71
% of HD patients on Erythropoietin (95% CI)	80% (79-81%)	79% (76-81%)	87% (84-90%)	87% (83-90%)	80% (80-81%)
Unit median (range)	80% (10-99%)	80% (50-99%)	88% (83-90%)	N/A	83% (10-100%)
Units	51	11	5	3	70
% of HD patients on thrice weekly	92%	99.8%	96%	65%	92%
Unit median (range)	96% (14-100%)	100% (99-100%)	99% (92-100%)	N/A	97% (14-100%)
Units	51	10	5	3	69
% of HD patients using : (95% CI)					
Standard membrane	10% (9-11%)	9% (7-11%)	0%	0%	9% (8-9%)
Modified cellulose	53% (52-54%)	47% (44-50%)	17% (14-20%)	86% (82-89%)	52% (51-53%)
Synthetic membrane	38% (36-39%)	45% (41-48%)	83% (80-87%)	14% (11-18%)	39% (39-41%)
Units	50	10	5	3	68
% of CAPD patients with disconnect (95% CI)	93% (93-94%)	100% (100-100%)	90% (86-94%)	100% (100-100%)	94% (93-94%)
Unit median (range)	100% (0-100%)	100% (100-100%)	100% (72-100%)	N/A	100% (0-100%)
Units	52	11	5	3	71
% of PD patients on Erythropoietin (95% CI)	64% (63-66%)	64% (59-68%)	56% (50-61%)	55% (44-66%)	64% (62-65%)
Unit median (range)	62% (10-100%)	60% (25-90%)	62% (29-100%)	N/A	61% (10-100%)
Units	51	10	5	3	69

HD=haemodialysis, PD =peritoneal dialysis

Table 3.13 Process measures of dialysis care for renal units in the UK 1998

Changes in processes of care in England and Wales 1993-1998

Tables 3.14 and 3.15 show a steady improvement in the measured processes of care in England and Wales from 1993 to 1998.

Process measures	England 1993	England 1995	England 1998
% of HD patients on bicarbonate	71%	89%	99.6%
Unit median (range)	87% (0-100%)	100% (44-100%)	100% (90-100%)
Units	51	47	52
% of all dialysis patients on Erythropoietin	43%	59%	74%
Unit median (range)	42% (12-74%)	60% (25-83%)	75% (10-97%)
Units	52	48	50
% of PD patients with disconnect catheters	64%	79%	93%
Unit median (range)	79% (0-100%)	92% (0-100%)	100% (0-100%)
Units	51	46	52
% of HD patients on thrice weekly	75%	82%	92%
Unit median (range)	86% (0-100%)	90% (10-100%)	96% (14-100%)
Units	52	48	51
% of HD patients using			
standard membrane	-	29.5%	10%
modified cellulose	-	45.5%	53%
synthetic membrane	-	25%	37%
Units	-	47	50

HD=haemodialysis, PD =peritoneal dialysis

Table 3.14 Changes in process measures of dialysis care in England 1993-1998

Process measures	Wales 1995	Wales 1998
% of HD patients on bicarbonate	77%	98.4%
Unit median (range)	88% (58-100%)	100% (94-100%)
Units	5	5
% of all dialysis patients on Erythropoietin	48%	75%
Unit median (range)	58% (32-66%)	75% (67-92%)
Units	4	5
% of PD patients with disconnect catheters	64%	90%
Unit median (range)	100% (46-100%)	100%(72-100%)
Units	5	5
% of HD patients on thrice weekly	77%	96%
Unit median (range)	88% (53-98%)	99%(92-100%)
Units	5	5
% of dialysis patients on	52%	59%

Process measures	Wales 1995	Wales 1998
hospital/satellite HD		
Unit median (range)	56% (48-74%)	62% (56-69%)
Units	4	5
% of HD patients using		
standard membrane	44%	0%
modified cellulose	29%	17%
synthetic membrane	27%	83%
Units	4	5

HD=haemodialysis, PD =peritoneal dialysis

Table 3.15 Changes in process measures of dialysis in Wales 1995-98

Factors restricting development of renal services

The questionnaire contained a section requesting information on factors which had constrained what was considered necessary development to meet the needs of the local population. The replies are summarised below in Table 3.16. These constraining factors are more or less unchanged since 1995.

Constraining factor	% of units
Capital funding	77
Physical space	74
Revenue funding	70
Nursing staff	66
Access provision	43
Medical manpower	36
Surgical staff	24
Nephrology consultant recruitment	14

Table 3.16 Constraining factors (of the responding units)

The number of units responding to each question varied between 63 and 66.

Regional Comparisons

The prevalence and acceptance rates for patients on renal therapy in different regions in England and countries are shown in Tables 3.17 and 3.18 and illustrated in Figure 3.3. These data do not take account of cross-regional boundary flows, nor differences in the key population characteristics such as age and ethnic minority distribution.

Region/Country	Acceptance (pmp)	Prevalence (pmp)
South West	83	454
Anglia Oxford	76	456
North West	79	489
S Thames	92	495
Trent	101	494

Northern Yorkshire	97	527
W Midlands	105	556
N Thames	107	693
England	92	523
Scotland	105	546
Wales	128	585
N. Ireland	107	439

Table 3.17 Regional treatment rates 1998 pmp

Region/Country	Acceptances (pmp)		Prevalent patients (pmp)	
	1995	1998	1995	1998
South West	72	83	381	454
Anglia Oxford	64	76	425	456
North West	84	79	441	489
S Thames	76	92	420	495
Trent	84	101	470	494
N Yorkshire	80	97	421	527
W Midlands	92	105	470	556
N Thames	105	107	608	693
England	82	92	458	523
Wales	109	128	487	585

Table 3.18: Changes in regional treatment rates p.m.p. 1995-8

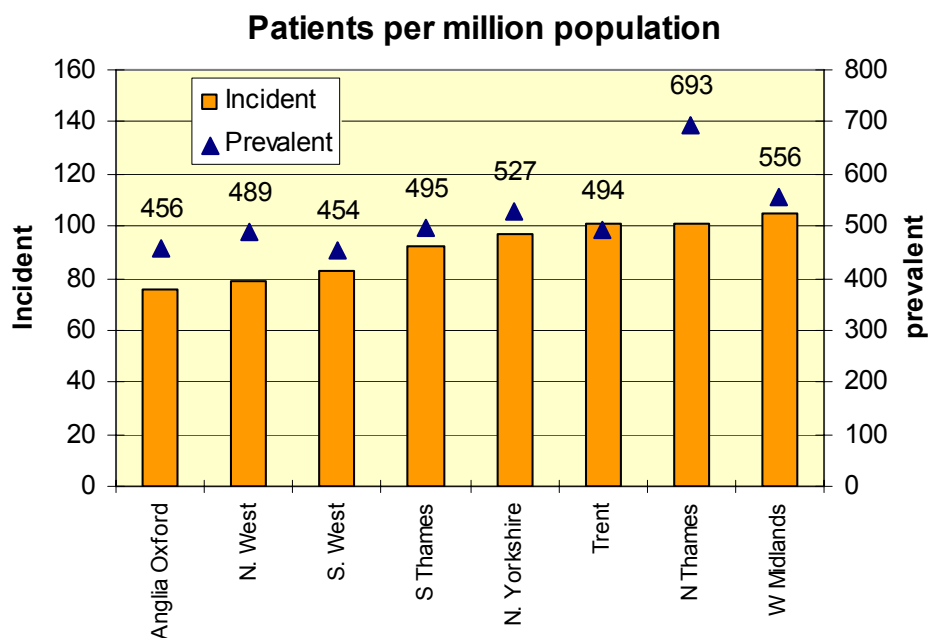


Figure 3.3 Incidence and prevalence rates (p.m.p.) of RRT patients by region

Some comparisons between regions in the facilities for dialysis are shown in Table 3.19. There are considerable disparities, which are not easily explained on the basis of age distribution or ethnic mix.

	<i>Unit s</i>	<i>Satellit es</i>	HD stations* pmp (Main units)	HD stations pmp (Satellite units)	WTE consultant Nephrologist pmp
South West	7	13	18	16	2.8
Anglia Oxford	5	4	16	7	1.8
N Thames	8	11	33	26	3.4
S Thames	6	7	22	8	3.5
N Yorkshire	10	11	27	12	2.9
North West	5	13	15	16	2.6
Trent	4	7	23	13	2.2
W Midlands	7	7	28	24	3.4
England	52	73	23	15	2.8
Wales	5	4	28	16	2.3
Scotland	11	5	44	5	3.5
N. Ireland	3	1	38	6	4.7

**figure includes temporary stations*

Table 3.19 Regional rates of supply of RRT facilities and staff 31/12/1998

Prevalence of hepatitis in patients on renal replacement therapy.

Hepatitis C

Renal units reported they had between 0% and 7% of patients as hepatitis C positive. Overall less than 2% of renal replacement therapy patients in the UK are hepatitis C positive.

Hepatitis B

Renal units reported they had between 0 and 5% of patients as hepatitis B antigen positive, with the large majority having no positive patients. Overall less than 1% of UK patients on renal replacement therapy are hepatitis B positive.

Discussion

There have been significant trends in the type of patients being treated by RRT with more patients being treated who are elderly and/or with co-morbidity.

The prevalent patients alive on renal replacement therapy seems to be growing at around 4-6% per annum. In England the absolute and relative growth rate is greatest for haemodialysis patients, especially in satellite units. Of the 3599 increased number of haemodialysis patients from 1993 to 1998, 66% were in satellite units. This is 37% of the total increase in RRT patients. Whilst home haemodialysis is still declining, home based therapy, which included most forms of peritoneal dialysis, still contributes a substantial proportion of the total (40%) (Table 3.3). With the growth of satellite units, which provide treatment nearer to patient's homes, treatment may be generally more convenient for patients.

The proportion of patients with a functioning transplant has fallen to below 50% for the first time. The proportion of patients with a functioning renal transplant is the result of the balance between the rate of renal transplantation and the rate of acceptance of new patients. Organ donor rates in the UK have fallen slightly in recent years with 7% less cadaveric transplants in 1998 than in 1997. Although there has been a 40% increase in live donor renal transplantation from 1997 to 1998, the overall renal transplant rate has declined by 2%.

The size of renal units varies considerably (Table 3.6). In Scotland there are more units per million population, possibly as a result of a widely scattered population. The size of satellite units is highly variable (Table 3.7). The pattern of care in satellite units varies considerably, from units which have near permanent medical attendance to those which have infrequent regular visits from a doctor. Over half the main renal units now have satellite haemodialysis units (42/71), with more planned, such that 53 of the 71 units should have satellites within three or four years. The planned expansion of satellite units reported in 1995 has not been fully realised. Only 14 of the 33 satellite units then planned came to fruition in the subsequent three years. This major growth area of dialysis has never been systematically studied, but is currently the subject of review in a project funded by the Department of Health's Health Technology Assessment R&D scheme and carried out with support from the Renal Registry.

Some satellites, especially in England, are larger than many main renal units, with up to 41 dialysis stations. It may not be appropriate for such large units to remain without full support. The NHS may need to consider employing additional nephrologists to establish these large satellites as independent renal units.

Relating the changes in WTE staffing in England to the changes in dialysis patient numbers, there has been very little change in the ratio of dialysis patients per consultant, but the number of non-consultant grade nephrology staff has not risen proportionately (Table 3.20). However the patients now being treated are older, with more co-morbidity and consume more time than those being treated in the early 90's. Furthermore it was demonstrated that nephrology staffing in the UK in 1991 lagged well behind that in other developed countries.

There does not appear to have been any significant catch up since then. It appears that Scotland has more nephrologists per million population than England or Wales (Table 3.10).

	1993	1998	% increase
Consultant nephrologists	129	192	49
Non-Consultant nephrologists	29	38	31
Trainee nephrologists	99	126	27
Dialysis Patients	9,045	13,405	48

Table 3.20 Changes in patient number and medical staff in England 1993-98

There were no sequential data available on nursing staff. The 1995 review did show qualitatively that nursing shortages were a major barrier to expansion, and this survey shows that this is now an even greater problem.

From the information on processes of care in Tables 3.13, 3.14, and 3.15 it can be seen that there is a welcome shift towards evidence based practice, with use of bicarbonate haemodialysis and disconnect peritoneal dialysis. The shift from standard cuprophane and cellulose membranes to synthetic membranes reflects the increasing evidence that synthetic membranes induce less inflammatory response, and are likely to lead to a reduction in some of the long-term complications of dialysis, particularly joint and other problems related to dialysis amyloid.

The regional variation in acceptance and stock rates seen in Tables 3.17 and 3.18 should be interpreted with caution as some regions, such as London with high ethnic minority groups, or others with a disproportionately elderly population, would be expected to have higher treatment rates than others. The provision of facilities per million population (Table 3.19) also shows considerable variation. This partly reflects historical patterns of development of renal services but over time provision should become more in line with population need.

Individual renal units appear to be working at a faster pace with more shifts per day, and rising numbers of patients in both satellite and main units. International comparisons on staffing suggest that the provision of nephrologists in the UK is well below norms found in other European countries

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