Chapter 3: National Renal Review 2002: summary report on adult and paediatric renal services

Summary

- The total annual acceptance rate of new patients for Renal Replacement Therapy (RRT) in the UK was 103.0 patients per million population (p.m.p.).

Adults

- The annual acceptance rate and prevalence rate of RRT for adults in the UK continued to increase; the rates for 2002 were 101 patients p.m.p. and 626 patients p.m.p. respectively.

- 50% of new patients were over 65 years old and 18% had a primary diagnosis of diabetic nephropathy.

- 34% of patients started RRT with an emergency or unplanned dialysis.

- 46% of the prevalent patients had a functioning transplant; of the dialysis patients, 73% were on haemodialysis.

- The number of satellite units increased by 41% (83 to 117) since 1998, accommodating 43% of unit-based haemodialysis patients.

- There were more haemodialysis stations p.m.p. in Scotland and Northern Ireland when compared to England and Wales.

- For haemodialysis, fewer patients were being dialysed twice weekly and there was an increased usage of synthetic membranes compared to 1998.

- For peritoneal dialysis, 99% of patients on CAPD were using the disconnect system, and there was also an increased use of APD for PD patients (26% of PD patients).

- There were more consultant nephrologists per million population in Scotland and Northern Ireland when compared to England and Wales.

- The majority of units reported a wide variety of resource constraints which were preventing the appropriate development of services. 18 units reported that due to lack of resources they had turned away a total of 230 patients considered suitable for treatment; none of these were in Scotland.

Children

- The annual acceptance rate for new paediatric patients in the UK in 2002 was 9 patients per million child population (2.0 per million total population). 15% of these new patients required dialysis as an emergency.

- Whilst the majority of new paediatric patients were white (78%), 18% were of Indo-Asian origin. However, in adult services, 85% of new patients were white and only 7% were Indo-Asian.

- The number of children receiving RRT remained stable. At the end of 2002, there were 827 paediatric patients receiving RRT; 74% had a transplant, and 64% of dialysis patients were on PD.

- Each Whole Time Equivalent consultant paediatric nephrologist (WTE) was, on average, responsible for 21 paediatric RRT patients, compared to 160 adult RRT patients for each WTE consultant adult nephrologist.

- At the end of 2002, 90% of funded trained paediatric renal nursing staff posts were filled, providing a ratio of 16.4 WTE trained nurses per million child population in the UK.

- The major factor reported as limiting development of the service was availability of trained specialist nurses. A shortage of consultant staff was also highlighted.

Introduction

This is the fourth renal survey since 1993. The purpose is to provide up to date information on incidence and prevalence rates of RRT, renal service provision, staffing levels, and satellite unit usage. Also to provide a base in England from which a regular review of National Service Framework implementation can be made. For the first time, paediatric services have been included in the UK review. This chapter will first consider the services for adults, and then children. This work was funded by a grant from the Department of Health.

Adults

Over the last two decades, there has been a substantial continual increase in the number of patients receiving RRT in the UK. The number of prevalent patients receiving therapy is dependent on acceptance rates and the survival of those receiving treatment. The UK rates have however seen a 4-fold increase since 1980. The 1993 National Renal Review returned a figure, for all patients receiving RRT in England, of 396 patients p.m.p.[1]. The reports of 1995 and 1998 returned figures of 476 patients p.m.p.[2] and 523 patients p.m.p.[3] respectively. Similar trends were observed in Scotland and Wales and quoted in the last report at 546 patients p.m.p. and 585 patients p.m.p. respectively. This may be compared with a current figure in many European countries of 700-900 patients p.m.p. Modelling work undertaken at Southampton University has indicated that a steady state position is not expected for at least 15 years[4].

The annual acceptance rate of new patients requiring RRT continues to rise worldwide, with provision in the UK trailing many developed countries. Annual acceptance rates for RRT relate to the incidence of established renal failure, and referral and selection for treatment. Since 1980 they have risen in the UK from around 25 patients p.m.p. annually to 101 patients p.m.p. for adults, but are much higher in most developed countries (see Chapter 21).

Methods

This work was funded through an unrestricted grant by the Department of Health and conducted by the UK Renal Registry. The survey was developed to document the provision of renal care in the UK up to the end of 2002 (31/12/02). A questionnaire was sent to all adult and paediatric renal units within the UK. Information was sought on the structure of care (beds, dialysis stations, staffing levels, satellite units), processes of dialysis use (treatment modality, membrane types) and patient numbers (new patients accepted during 2002, prevalent patients at the end of 2002, patients who were declined RRT during 2002). Information was also sought on the numbers of patients with Hepatitis B, C or HIV.

The questionnaires were sent to the adult and paediatric units in summer 2003. For the majority of returned questionnaires, there was at least one missing piece of data which required the Registry to contact the renal unit. Those units registered with the UK Renal Registry had much of the data supplied from the Registry database; this facilitated the return of more detailed and validated data than was possible by questionnaire. The Scottish Renal Registry supplied the data for two of the Scottish

units. The final validated data were not complete until March 2004, providing complete data for the 71 adult and 13 paediatric renal units in the UK.

These data were analysed using SAS software. The Office for National Statistics' (ONS) population estimates for the UK were used to calculate the population denominators for the annual acceptance, prevalence, staffing and provision rates per million population. The 95% confidence intervals for rates were calculated using normal approximations to the Poisson distribution, and elsewhere confidence intervals were calculated using normal approximations to the binomial distribution. Poisson regression analysis was used to determine whether the variation in acceptance and prevalence rates were statistically significant.

Data were compared with those collected from the 1998 Renal Survey and the UK Renal Registry. Discrepancies were checked with the original paper return, and if necessary by a telephone call to the renal unit director.

New patients starting renal replacement therapy

The annual acceptance rate for new adult patients in the UK in 2002 was 101 patients p.m.p.; these data are shown in Table 3.1. There was significant variation between the annual acceptance rates p.m.p. in England, Wales, Scotland and N. Ireland ($p < 0.0001$, Poisson regression) with the rate lowest in England at 98 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 renal units were also asked whether they were able to accommodate all patients onto their RRT programme. In Table 3.2, 18 units reported that they had to turn away some patients, with the maximum being turned away ranging from 2-50 patients. It is unknown how many of these patients were then accepted by another renal unit onto their RRT programme. The renal unit with the highest refusal was based in London, where large cross boundary flows are known to occur. Due to these cross boundary flows, rates were calculated by region rather than for each renal unit. Units in Scotland were able to accept all patients referred for RRT.

Table 3.1. Annual acceptance data for adult new patients accepted onto RRT in 2002

	England	Wales	Scotland	N.Ireland	UK
No of renal units	52	5	10	4	71
Patient numbers	4,863	343	602	185	5,993
Population (millions)	49.6	2.9	5.0	1.7	59.2
Unit Median	94	42	65	33	82
(range)	(12-176)	(19-142)	(18-116)	(25-94)	(12-176)
Acceptance rate pmp	98	118	120	109	101
(95% CI)	(95-101)	(106-131)	(111-130)	(93-125)	(99-104)

Table 3.2. Refusal rate

	England	Wales	Scotland	N.Ireland	UK
No of Units	15	2	0	1	18
No of Patients Refused	222	4	0	4	230
Range No of Patients	0-50	0-2	0	0-4	0-50

There were 62 renal units able to provide data regarding the patients' primary diagnoses. From these units, 18% of patients started RRT due to diabetic nephropathy. There was no substantial variation between the 4 countries, however between centres, the percentage ranged from 3% to 40%. Data regarding age groups were more complete with 70 units able to provide the age grouping. Of those patients starting RRT in 2002, 50% were aged 65 or over, with no substantial variation between the 4 countries, however between centres, the percentage ranged from 26 to 70% (Table 3.3).

The renal units in England had a higher mix of ethnic minorities starting RRT than other UK countries. However these data were poorly recorded and available from only 53 renal units. For these units, 7%, 4% and 1% of new patients were Indo-Asian,

Table 3.3. Profile of adult new patients accepted onto RRT in the UK in 2002

	England	Wales	Scotland	N.Ireland	UK
No of centres	44	5	9	4	62
No of patients	4,057	343	572	185	5,157
Number diabetic (%)	758 (19%)	43 (13%)	94 (16%)	42 (23%)	937 (18%)
Median % (range)	17 (3-40)	14 (5-37)	16 (8-28)	24 (12-25)	17 (3-40)
No of centres	51	5	10	4	70
No of patients	4,744	343	602	185	5,874
No of patients 65+ (%)	2,343 (49%)	187 (54%)	324 (54%)	99 (53%)	2,953 (50%)
Median % (range)	51 (26-70)	55 (48-68)	53 (38-69)	56 (38-58)	52 (26-70)
No of centres	39	2	8	4	53
No of patients	3,666	130	454	185	4,435
Indo-Asian (%)	304 (8%)	1 (0.9%)	3 (0.8%)	1 (0.5%)	309 (7%)
African/Caribbean (%)	194 (5%)	0 (0%)	1 (0.2%)	1 (0.5%)	196 (4%)
Chinese (%)	22 (1%)	0 (0%)	2 (0.4%)	1 (0.5%)	25 (1%)
Others (%)	150 (4%)	0 (0%)	0 (0%)	0 (0%)	150 (3%)
No of centres	36	5	6	4	51
No of patients	3,447	343	401	185	4,376
No of emergency dialysis (%)	1,108 (32%)	144 (42%)	129 (32%)	111 (60%)	1,492 (34%)
Median % (range)	30 (5-80)	40 (11-70)	26 (16-50)	45 (5-85)	30 (5-85)

Table 3.4. Annual acceptance rate for new adult patients on RRT 1991-2002 in the UK

Year	England		Wales		Scotland*		N. Ireland		UK	
	Pts No	Rate pmp	Pts No	Rate pmp	Pts No	Rate pmp	Pts No	Rate pmp	Pts No	Rate pmp
1991/2	3,247	67	-	-	317	62	-	-	-	-
1993	3,197	73	275	95	404	79	-	-	-	-
1994	3,371	77	308	106	388	76	-	-	-	-
1995	3,726	82	318	109	445	87	-	-	-	-
1998	4,566	92	374	128	536	105	181	107	5,657	96
2002	**4,863**	**98**	**343**	**118**	**602**	**120**	**185**	**109**	**5,993**	**101**

*Pre 1998 data from Scottish Renal Registry

African/Caribbean and Chinese respectively (Table 3.3).

Data regarding new patients presenting as an emergency (defined as requiring an unplanned start of dialysis e.g. acute pulmonary oedema or presenting with end stage renal disease) were also collected. Within this category 34% of patients in the UK were started as an emergency. There were marked variations between centres (5-85%), which could be due to the varying interpretation of the definition of emergency (Table 3.3).

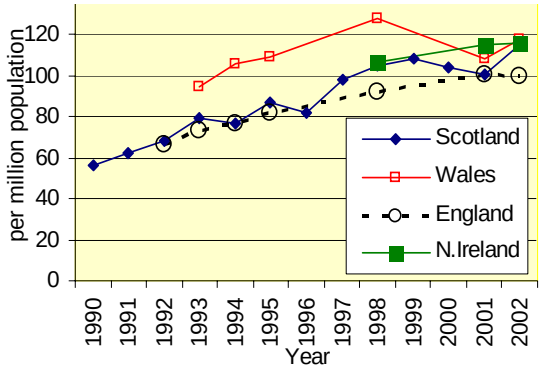

Figure 3.1. Annual acceptance rate for new adult patients on RRT 1990-2002 in the UK

Changes in acceptance rates in England and Wales 1993-2002

The annual acceptance rate for England has been progressively rising (Table 3.4 and Figure 3.1) and the annual acceptance rates for Wales and Northern Ireland in 2002 appear to have reached a plateau compared to 1998. Data from the Scottish Registry from 1999 – 2001 also indicate that their annual acceptance rate has now reached a plateau.

For 2002, the proportion of new patients aged 65 years or over continued to increase and equated to 50% of total new patients. However, the proportion of patients with diabetes as the primary cause for renal failure seemed to have reached a plateau (18%, Table 3.5).

Table 3.5. Changing profile of new patients accepted onto RRT in the UK

	% over 65	% diabetic
1976-78 (UK)	1	2
1982-84 (UK)	11	8
1986-88 (UK)	23	12
1991-92 (Eng)	37	14
1995 (E & W)	39	15
1998 (UK)	47	19
2002 (UK)	50	18

Sources: EDTA 1976-1988, National Renal Surveys 1991-2002

Prevalent adult patients receiving renal replacement therapy 31/12/2002

The UK is now treating over 37,000 patients with established renal failure, with a prevalence rate of 626 patients p.m.p. (Table 3.6).

There was significant variation between the prevalence rates for the four countries, with England having the lowest prevalence rate ($p<0.0001$, Poisson regression). England had the lowest number of renal units per million population, and as a consequence these units were larger than in the other UK countries.

Haemodialysis is the predominant dialysis modality, with the percentage of dialysis patients on haemodialysis ranging from 66 to 87 between countries.

Data for Wales were originally calculated by using the sum of the data supplied by the Welsh renal units on the Registry. However, this analysis appeared to show an unexpected low percentage of transplant patients for Wales. When these data were re-analysed by individual patients' postcode, 104 transplant patients receiving treatment at the Liverpool renal unit were then reallocated to North Wales.

More detailed analyses of prevalence rates are demonstrated in Chapter 5 of this report. Large variations in the prevalence

rates by postcode were found within England.

Changes in adult prevalence 1993-2002

The changes in the numbers and distribution of prevalent patients from between 1993 to 2002 are shown in Table 3.7 and the trend is illustrated in Figures 3.2 and 3.3 for England, and Figure 3.4 for the UK. The general pattern is for the greatest increase to be in unit based haemodialysis (including satellite unit dialysis). In England, the number of patients on home haemodialysis in 2002 fell by nearly 50% compared to 1993 figure. Although some of this decrease was due to the increased availability of satellite dialysis nearer to home, many renal units were no longer able to provide a home dialysis service. The 2002 NICE guidance appraisal to provide increased provision of home haemodialysis may reverse this trend.

For all countries except Wales, the number of patients on peritoneal dialysis fell when compared with the 1998 survey. Whilst the numbers with a functioning transplant continued to rise, the percentage growth was less than that of the haemodialysis patients, thus producing a proportional fall as a percentage of total renal replacement therapy.

Table 3.6. UK Patients receiving Renal Replacement Therapy - December 31, 2002

	England	Wales	Scotland	N.Ireland	UK
No of renal units	52	5	10	4	71
Total RRT patients	30,498	2006	3,418	1,117	37,039
Rate pmp (95% CI)	615 (608-622)	692 (652-722)	684 (661-707)	657 (619-696)	626 (620-633)
Rate per unit	587	401	342	279	522
Units pmp	1.0	1.7	2.0	2.4	1.2
Haemodialysis	11369 (37%)	720 (36%)	1380 (40%)	512 (46%)	13981 (38%)
Home haemodialysis	420 (1%)	9 (0%)	52 (2%)	1 (0%)	482 (1%)
Peritoneal dialysis	4605 (15%)	380 (19%)	376 (11%)	80 (7%)	5441 (15%)
Transplants	14,104* (46%)	897 (45%)	1,610 (47%)	524 (47%)	17,135* (46%)
% dialysis pts on HD	72%	66%	79%	87%	73%

* the number of transplant patients in one centre was estimated from previous 1998 survey data and using the average national growth rate

Table 3.7. Adult patients receiving RRT in UK (1993-2002)

Country	Year	Patient No	Rate pmp	HD	Home HD	PD	Transplants
England	1993	19,212	396	3,899 (20%)	806 (4%)	4,340 (23%)	10,167 (53%)
	1995	22,322*	458	5,383(24%)	725 (3%)	4,880(22%)	11,334 (51%)**
	1998	25,892	523	7,788 (30%)	516 (2%)	5,101 (20%)	12,487 (48%)
	2002	**30,498**	**615**	**11,369 (37%)**	**420(1%)**	**4,605(15%)**	**14,104 (46%)‡**
Wales	1995	1,560	535	388 (27%)	33 (2%)	314 (22%)	685 (48%)
	1998	1,716	585	451 (26%)	17 (1%)	301 (18%)	947 (55%)
	2002	**2,006**	**692**	**720 (36%)**	**9 (0%)**	**380 (19%)**	**897 (45%)**
Scotland	1998	2,798	546	976 (35%)	69 (2%)	441 (16%)	1,312 (47%)
	2002	**3,418**	**684**	**1,380 (40%)**	**52 (2%)**	**376 (11%)**	**1,610 (47%)**
N Ireland	1998	741	439	356 (48%)	0	84 (11%)	301 (41%)
	2002	**1,117**	**657**	**512 (46%)**	**1 (0%)**	**80 (7%)**	**524 (47%)**
UK	1998	31,347	529	9,571 (30%)	602 (2%)	5,927 (19%)	15,247 (49%)
	2002	**37,039**	**626**	**13981 (38%)**	**482 (1%)**	**5441 (15%)**	**17,135 (46%)**

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

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

‡ the number of transplant patients in one centre was estimated from previous 1998 survey data and using the average national growth rate

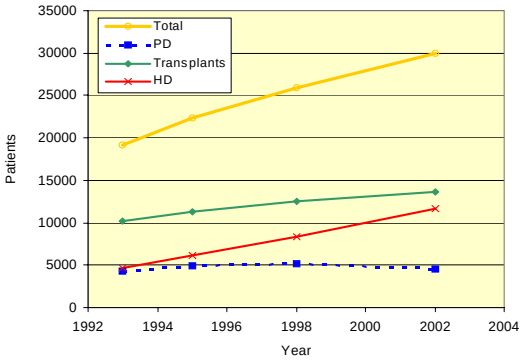

Figure 3.2. Number of adult patients on each modality and total RRT in England 1993-2002

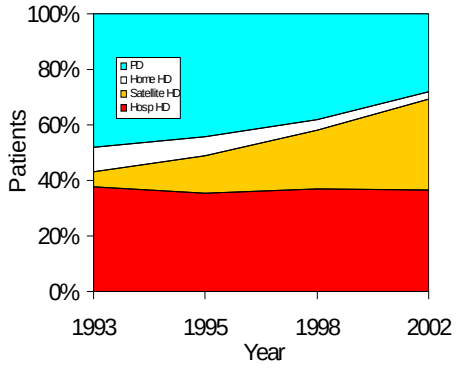

Figure 3.3. Percentage of adult patients on each dialysis modality in England 1993-2002

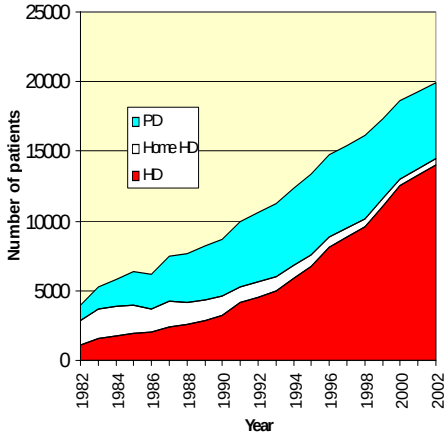

Figure 3.4. Dialysis modality trends in adults in the UK 1982-2002

Renal unit facilities for adults

Renal unit facilities at the end of 2002 are summarised in Table 3.8. '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 stations were usually in in-patient areas. Temporary stations were utilised by 34 renal units and the 141 temporary stations made up 4% of the total haemodialysis stations in use.

Of permanent haemodialysis stations, 47% were in satellite units. There was a wide variation of 4-59 haemodialysis stations for main unit hospital based haemodialysis and a similar variation of 2-51 haemodialysis stations for satellite unit haemodialysis (Tables 3.8 and 3.9).

There were more haemodialysis stations p.m.p. in Scotland and Northern Ireland when compared to England and Wales. Due to the low ratio of renal units p.m.p. in England, the renal units in England had a much higher mean number of haemodialysis stations per unit.

In England, a higher percentage of haemodialysis stations (52%) and haemodialysis patients (45%) were in satellite units compared to Wales and Scotland. This reflects the larger size of renal units in England and the necessity for more localised provision of haemodialysis facilities, combined with the space limitation in expanding haemodialysis capacity within the main renal units (Tables 3.8 and 3.9).

There has only been a small increase in the renal inpatient bed provision in England (from 24 beds p.m.p. in 1998 to 28 beds p.m.p. in 2002) to support the rise in numbers of dialysis patients, many of whom have co-morbid diseases and require episodes of in-patient care. The number of beds in both Scotland and Wales fell (38 beds p.m.p. to 35 beds p.m.p. and 32 beds p.m.p. to 28 beds p.m.p. respectively), with

Wales then having the same bed provision as England.

Some units (4 in England, one each in the other countries) reported no dedicated renal beds, as the nephrologists were also general physicians, and renal patients were admitted to general medical beds.

Changes in adult renal facilities in England and Wales 1993-2002

Despite the large growth in patient numbers there was no increase in the total number of UK renal units between 1993 and 2002 (Table 3.10). Although there had been several new renal units in England there had also been mergers among the London renal units, resulting in no overall increase in number. The number of renal units p.m.p. was lower in England (1.0) than in Scotland

Table 3.8. Renal unit facilities in the UK – 31/12/2002

	England	Wales	Scotland	N.Ireland	UK
Main renal units	52	5	10	4	71
Units per million population	1.0	1.7	2.0	2.4	1.2
Total beds	1,401	82	176	37	1,696
Unit no of beds median (range)	24 (0-75)	15 (0-37)	21 (0-33)	7 (0-23)	23 (0-75)
Beds per million population	28	28	35	22	29
Haemodialysis					
No of permanent stations in main unit	1,198	81	236	106	1,621
Median no of permanent stations (range)	22 (4-59)	16 (11-20)	23 (11-42)	23 (20-40)	22 (4-59)
No of Satellite stations (% of satellite to total number of permanent stations)	1,276 (52%)	65 (45%)	90 (28%)	0 (0%)	1,431 (47%)
Total permanent stations	2,474	146	326	106	3,052
No of units with temporary stations	28	2	3	1	34
No of temporary stations (range)	108 (0-12)	14 (0-11)	14 (0-6)	5 (0-5)	141 (0-12)
Total no of HD stations	2,582	160	340	111	3,193
HD stations per million population	52	55	68	65	54
Mean HD stations per unit	50	32	34	28	45
No of HD patients per station	4.6	4.9	4.2	4.8	4.6
HD shifts / week	938	84	164	63	1,249
Unit median (range)	18 (12-24)	18 (15-18)	18 (12-20)	17 (12-18)	18 (12-24)

Table 3.9. Satellite dialysis units in the UK – 31/12/2002

	England	Wales	Scotland	N. Ireland	Total UK
No. of units with current satellites	41	2	6	0	49
No. of current satellites (%NHS managed)	101 (77%)	5 (0%)	11 (91%)	0 (N/A)	117 (75%)
Current satellite units per million population	2.0	1.7	2.2	0.0	2.0
Range per renal unit	0-6	0-3	0-4	N/A	0-6
Total HD stations in satellite unit	1,276	65	90	N/A	1,431
Median no of stations per satellite (range)	12 (3-51)	13 (6-18)	6 (2-28)	N/A	12(2-51)
Total patients in satellites units	5,112	244	347	0	5,703
(% of patients on unit HD in satellite units)	(45%)	(45%)	(25%)	(0%)	(43%)
Median no of patients per satellite (range)	45 (3-222)	53 (15-64)	18 (3-112)	N/A	44 (3-222)
No. of units with planned satellites	37	2	7	2	48
No. of units without satellites planning to start a satellite centre	6	1	3	2	12
No of planned new satellites	34*	3	8	2	47
No of planned new stations	379	64	57	28	528
Median no of stations per satellite (range)	12 (8-31)	N/A(?-64)	6(4-16)	N/A (8-20)	12 (4-64)

* some planned satellites are to be shared by more than one renal unit.

(2.0), Wales (1.7) or Northern Ireland (2.4) (Table 3.8).

The expansion in patient numbers was accommodated by increasing the number of haemodialysis stations available to renal units (from 2,341 stations in 1998 to 3,193 stations in 2002) without an increase in the number of units. There was an increase in the size of the main units, but this was achieved to a major extent by increasing the number of satellite units and stations. Since 1998, the number of haemodialysis stations in satellite units in the UK increased by 70% (842 to 1,431 stations) and the number of patients dialysing in satellite units increased by 79% (3,182 to 5,703 patients). Satellite stations made up 47% of total HD stations in 2002, compared to 36% in 1998 (Tables 3.10 and 3.11).

During the periods 1993-1995, 1995-1998, 1998-2002 the absolute annual rate of increase in England of total haemodialysis stations varied from 164 to 117 to 138 respectively (Table 3.10).

Table 3.10. Changes in adult renal unit facilities in UK 1993-2002

Country		Main renal units	Total HD stations	Total HD stations per renal unit	Main units permanent stations	Main HD stations per renal unit	Satellite stations	Temp stations
England	1993	52	932	18	743	14	189	N/A
	1995	51	1,423	28	832	16	472	119
	1998	52	1,890	36	1021	20	761	108
	2002	52	2,582	50	1198	23	1276	108
Wales	1995	5	97	19	65	13	28	4
	1998	5	130	26	83	17	47	0
	2002	5	160	32	81	16	65	14
Scotland	1998	11	247	22	210	19	24	13
	2002	10	340	34	236	24	90	14
N.Ireland	1998	3	74	25	62	21	10	2
	2002	4	111	28	106	27	0	5
UK	1998	71	2341	109	1376	77	842	123
	2002	71	3193	144	1621	90	1431	141

Table 3.11. Changes in satellite unit facilities in UK 1993-2002

Country	Year	Units with satellites	Current satellite units	Total HD Stations	Median per satellite (range)	Total no of patients	Median per satellite (range)	Planned Satellites
England	1993	17	36	189	6 (2-10)	476	15 (1-41)	14
	1995	30	60	472	7 (2-31)	1,476	24 (1-68)	37
	1998	36	73	761	8 (3-41)	2,847	35 (6-160)	28
	2002	41	101	1276	12 (3-51)	5,112	44 (3-222)	34
Wales	1995	2	3	28	8 (6-14)	64	32 (25-39)	5
	1998	2	4	47	13 (9-13)	194	49 (36-60)	2
	2002	2	5	65	13 (6-18)	244	53 (15-64)	3
Scotland	1998	3	5	24	4 (2-9)	102	16 (3-52)	5
	2002	6	11	90	6 (2-28)	347	18 (3-112)	8
N. Ireland	1998	1	1	10	10	39	39	0
	2002	0	0	N/A	N/A	0	N/A	2
UK	1998	42	83	842	9 (2-41)	3,182	36 (3-160)	35
	2002	49	117	1,431	12 (2-51)	5,703	44 (3-222)	47

Staffing in adult renal units

Details of staffing in renal units are shown in Tables 3.12, 3.13 and 3.14. Relating the changes in WTE staffing in UK to the changes in patient numbers, there had been an improvement in the ratio of RRT patients, and dialysis patients, per WTE consultant nephrologist in England and Scotland. The ratio for Scotland had improved from 1 WTE consultant per 82 dialysis patients in 1998 to 1 per 68 dialysis patients in 2002, and for England from 1 per 96 dialysis patients to 1 per 87 dialysis patients. In Northern Ireland the ratio was 1 WTE consultant nephrologist per 64 dialysis patients in 2002 (56 in 1998), but in Wales it was 1 per 150 dialysis patients, with little change in the last 7 years.

There had been no substantial increase in the number of transplant surgeons in the UK since 1998. The numbers of WTE consultant transplant surgeons p.m.p. throughout the UK were similar. Wales had a higher proportion of non-consultant grade physicians.

Table 3.12. Medical staffing in adult renal units in the UK 2002

	England	Wales	Scotland	N. Ireland	UK
Consultant nephrologists:					
Numbers	250	14	39	11	314
Number p.m.p.	5.0	4.8	7.8	6.5	5.3
Number per unit	4.8	2.8	3.9	2.8	4.4
WTE nephrology	188.4	7.4	26.5	9.2	231.5
WTE p.m.p.	3.8	2.6	5.3	5.4	3.9
No of pts per consultant*	122	136	88	102	118
No of pts per WTE consultant*	162	257	129	121	160
Age group:					
30-34	3 (1%)	0	0	0	3 (1%)
35-39	53 (21%)	0	6 (15%)	4 (36%)	63 (20%)
40-44	61 (24%)	8 (57%)	10 (26%)	2 (18%)	81 (26%)
45-49	53 (21%)	0	10 (26%)	1 (9%)	64 (20%)
50-54	33 (13%)	6 (43%)	6 (15%)	3 (27%)	48 (15%)
55-59	21 (8%)	0	3 (8%)	1 (9%)	25 (8%)
60-64	13 (5%)	0	0	0	13 (4%)
Unknown	13 (5%)	0	4 (10%)	0	17 (5%)
Transplant surgeons:					
Numbers	68	5	10	1	84
Number p.m.p.	1.4	1.7	2.0	0.6	1.4
No. of units	24	2	3	1	30
WTE transplant surgeons	35.3	2.6	4.7	1	43.6
WTE p.m.p.	0.7	0.9	0.9	0.6	0.7
Associate specialists	17	5	5	0	27
Clinical assistants/Staff grades	34	6	7	2	49
Clinical/Research fellows	67	1	5	3	76
Specialist Registrars NTN/ LAT/LAS	145	7	15	3	170
SHOs/Trust grade doctors	199	11	24	6	240
HOs	41	3	6	3	53

* For the RRT patients/consultant ratio, the numbers were calculated from the total number of patients via the renal units attribution and not via the postcode attribution

In 2002, Northern Ireland had the highest rate of WTE trained nurses p.m.p. at 58.0, compared to 50.6 in Scotland, 32.6 in Wales and 29.5 in England. The ratio of numbers of WTE nursing staff to main unit haemodialysis patients was 0.2 in all 4 countries. Scotland had a higher ratio of trained to untrained nursing staff (5.4) than Northern Ireland (3.1), England (2.6) and Wales (2.3).

All units had a dietitian working for the renal department. Only 9 units reported having a dedicated renal physiotherapist, and 7 units had a dedicated renal occupational therapist. Only 3 units had a complete multi-professional renal team. Details are listed in Table 3.15.

Table 3.13. Changes in number of consultant nephrologists and ratio of patients per consultant in the UK, 1993-2002, for adults

		Numbers	Number pmp	Number per unit	WTE	WTE pmp.	No of RRT pts p.c*	No of RRT pts p.w.c**	No of dialysis pts p.c	No of dialysis pts p.w.c
England	1993	129	-	-	n/a	-	149	-	70	-
	1995	151	-	3.0	98.4	-	148	227	73	112
	1998	192	3.9	3.7	139.7	2.8	135	185	70	96
	2002	**250**	**5.0**	**4.8**	**188.4**	**3.8**	**122**	**162**	**66**	**87**
Wales	1995	11		2.2	5.5		142	284	80	159
	1998	12	4.1	2.4	6.8	2.3	143	252	64	113
	2002	**14**	**4.8**	**2.8**	**7.4**	**2.6**	**136*** **	**257*** **	**79**	**150**
Scotland	1998	33	6.4	3.0	18.1	3.5	85	155	45	82
	2002	**39**	**7.8**	**3.9**	**26.5**	**5.3**	**88**	**129**	**46**	**68**
N. Ireland	1998	9	5.3	3.0	7.9	4.7	105	119	49	56
	2002	**11**	**6.5**	**2.8**	**9.2**	**5.4**	**102**	**121**	**54**	**64**
UK	1998	246	4.2	3.5	172.5	2.9	127	182	65	93
	2002	**314**	**5.3**	**4.4**	**231.5**	**3.9**	**120**	**162**	**63**	**86**

* p.c = per consultant ** p.w.c = per WTE consultant *** some Welsh transplant patients are cared for in England.

Table 3.14. Changes in number of other medical staffing in UK 1993-2002, for adults

		Transplant surgeons		Assoc Spec	Staff Grade/ Clin Assist	Research Fellows	SpR*	SHO	HO
		WTE (No.)	WTE pmp	No.	No.	No.	No.	No.	No.
England	1993	- (60)	-	8	21	25	99	122	29
	1995	24.4 (55)	-	9	28	35	106	131	27
	1998	35.8 (69)	0.7	13	25	49	126	144	35
	2002	**35.3 (68)**	**0.7**	**17**	**34**	**67**	**145**	**199**	**41**
Wales	1995	1.4 (2)	-	3	7	0	6	10	2
	1998	2.1 (3)	0.7	5	3	0	8	11	3
	2002	**2.6 (5)**	**0.9**	**5**	**6**	**1**	**7**	**11**	**3**
Scotland	1998	3.5 (12)	0.7	1	8	8	16	25	4
	2002	**4.7 (10)**	**0.9**	**5**	**7**	**5**	**15**	**24**	**6**
N.Ireland	1998	1.1 (1)	0.7	0	0	2	3	6	3
	2002	**1 (1)**	**0.6**	**0**	**2**	**3**	**3**	**6**	**3**
UK	1998	42.5 (85)	0.7	19	36	59	153	186	45
	2002	**43.6 (84)**	**0.7**	**27**	**49**	**76**	**170**	**240**	**53**

* Senior Registrar and Registrar prior to 2002

Table 3.15. Professions allied to medicine staffing adult renal units in the UK 31/12/2002

	England	Wales	Scotland	N. Ireland	UK
Nursing Staff:					
WTE available funding	1586.7	98.8	279.0	105.0	2069.5
Actual WTE in post (and %)	1465.4 (92)	94.6 (96)	252.8 (91)	98.7 (94)	1911.5 (92)
WTE per million population	29.5	32.6	50.6	58.0	32.3
No. of units replying	51	5	10	4	70
Median (range)	23 (7-78)	17 (11-25)	28 (12-36)	27 (13-31)	24 (7-78)
% of nurses with ENB qualification	38%	25%	11%	27%	34%
Ratio of trained nurses to main unit HD patients	0.2	0.2	0.2	0.2	0.2
Ratio of trained nurses to non trained nursing staff	2.6	2.3	5.4	3.1	2.8
Non trained nursing staff:					
WTE available funding	628.7	42.8	47.1	32.0	750.6
Actual WTE in post (and %)	567.6 (90)	41.2 (96)	47.1 (100)	32 (100)	687.9 (92)
WTE per million population	11.4	14.2	9.4	18.8	11.6
No. of units	51	5	10	4	70
Median (range)	7.2 (0-40)	4.8 (1-16)	2.4 (0-15)	3.0 (0-26)	6.2 (0-40)
Dietitians numbers WTE	110.8	6.2	15.8	5.8	138.6
% NHS	99%	100%	98%	100%	99%
No. of units with dedicated dietitians	52	5	10	4	71
Average per unit	2.1	1.2	1.6	1.5	2.0
Social workers numbers WTE	40.7	3.4	7.1	5.5	56.7
% NHS	66%	74%	70%	100%	70%
No. of units with dedicated social worker	35	4	6	4	49
Average per unit	0.8	0.7	0.7	1.4	0.8
Technicians numbers WTE	160.9	5	25.5	12	203.4
% NHS	98%	90%	100%	83%	97%
No. of units with own technicians	46	4	8	4	62
Average per unit	3.1	1.0	2.6	3.0	2.9
Counsellors numbers WTE	14.5	0.5	0.0	2.7	17.7
% NHS funded	87.2%	100%	N/A	100%	89.5%
No. of units with renal counsellors	22	1	0	1	24
Average per unit	0.3	0.1	N/A	0.7	0.2
IT support numbers WTE	38.9	5.5	5.5	0	49.9
% NHS	96.4%	87%	100%	N/A	95.8%
No. of units with dedicated IT staff	31	4	4	0	40
Average per unit	0.8	1.1	0.6	N/A	0.7
Pharmacists WTE	38.6	0.8	5.5	3.0	47.9
% NHS	97.4%	100%	100%	100%	97.9%
No of units with dedicated pharmacist	40	1	7	3	51
Average per unit	0.7	0.2	0.6	0.8	0.7

Table 3.16. Changes in professions allied to medicine in the UK 1995-2002, for adults

		Dietitians WTE	Average per unit	Social workers WTE	Average per unit	Technicians WTE	Average per unit
England	1995	70.5	1.4	32.9	0.7	156.5	3.2
	1998	88.4	1.7	42.6	0.8	150	2.9
	2002	**110.8**	**2.1**	**40.7**	**0.8**	**160.9**	**3.1**
Wales	1995	5	1	2.7	0.5	11	2.2
	1998	5.5	1.1	3.8	0.8	8	1.6
	2002	**6.2**	**1.2**	**3.4**	**0.7**	**5.0**	**1.0**
Scotland	1998	14.3	1.3	5.4	0.5	21.5	2
	2002	**15.8**	**1.6**	**7.1**	**0.7**	**25.5**	**2.6**
N.Ireland	1998	4.2	1.4	3.1	1	8.3	2.8
	2002	**5.8**	**1.5**	**5.5**	**1.4**	**12**	**3**
UK	1998	112.4	1.6	54.9	0.8	187.8	2.6
	2002	**138.6**	**2.0**	**56.7**	**0.8**	**203.4**	**2.9**

Processes of care for adults

Information on processes of care is listed in Tables 3.17a, 3.17b, 3.18a and 3.18b. Northern Ireland had the highest percentage of haemodialysis patients dialysing twice weekly (11%), but this was a marked improvement from 35% in 1998. In Scotland geographical problems accounted for 25% of those patients who were dialysed twice weekly. The main reasons for UK patients currently dialysing twice weekly appeared to be because of preserved renal function or patient choice. In the UK, 95% of haemodialysis patients were dialysed in 3-5 hours sessions. Almost all patients on CAPD were using the disconnect system. Northern Ireland made the highest use of modified cellulose dialysers and the least use of synthetic membranes compared with the other UK countries.

Factors restricting development of adult renal services

The questionnaire contained a section requesting information on factors which had constrained what was considered as necessary development to meet the needs of the local population. The replies are summarised below in Table 3.19; they were similar to the replies received in the 1995 and 1998 surveys.

Regional comparisons for adults

The prevalence and annual acceptance rates for patients on renal therapy in different regions in England and countries are shown in Tables 3.20 and 3.21 and illustrated in Figure 3.5. 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. These are considered in more detail in Chapters 4 and 5.

Table 3.17a. Process measures of haemodialysis care for renal units in the UK 2002, for adults

Process measures	England	Wales	Scotland	N. Ireland	UK
Units	52	5	10	4	71
% of dialysis patients on hospital/satellite HD	69%	65%	76%	86%	70%
Unit median (range)	71% (44-100%)	64% (63-79%)	77% (62-82%)	86% (82-89%)	71% (44-100%)
% of HD patients on twice weekly	4%	8%	0.6%	11%	4%
Unit median (range)	2% (0-38%)	2% (0-15%)	0.4% (0-2%)	12% (1-17%)	2% (0-38%)
Units with >5% twice weekly HD of HD patients	16	2	0	3	21
Reasons for twice weekly:					
Geographical reasons	3%	7%	25%	-	3%
Preserved renal function	58%	89%	50%	70%	62%
Financial restrictions	9%	-	-	15%	9%
Lack of facilities	10%	-	-	15%	10%
Others	20%	4%	25%	-	17%
Prescribed time on HD					
3-5 hours	96%	95%	93%	100%	96%
Unit median (range)	100% (45-100%)	100% (82-100%)	98% (75-100%)	100% (100-100%)	100% (45-100%)
% of HD patients using: (95% CI)					
Standard membrane	0%	0%	0%	0%	0%
Modified cellulose	29% (28-30%)	7% (5-9%)	30% (28-33%)	64% (60-68%)	29% (28-30%)
Synthetic membrane	59% (58-60%)	83% (80-85%)	57% (54-59%)	11% (9-14%)	58% (57-59%)
High Flux membrane	12% (11-13%)	11% (8-13%)	13% (11-15%)	25% (21-29%)	13% (11-13%)
% of HD patients on Haemodiafiltration (95% CI)	2.9% (2.6-3.2%)	2.9% (1.7-4.1%)	1.6% (0.9-2.3%)	0% (0-0%)	2.6% (2.4-2.9%)
Unit median (range)	0% (0-56%)	0% (0-20%)	0% (0-13%)	0% (0-0%)	0% (0-56%)
% of HD patients on Erythropoietin (95% CI)	89% (88-90%)	97% (95-99%)	92% (90-94%)	96% (95-98%)	90% (89-91%)
Unit median (range)	91% (52-99)	96% (92-100%)	91% (88-98)	98% (85-100%)	92% (52-100%)
Units	45	4	9	4	62
% of non-home HD patients reusing their dialysers (95% CI)	5.2% (4.8-5.6%)	0%	0%	0%	4.2% (3.9-4.6%)
Unit median (range)	0% (0-95%)	0%	0%	0%	0% (0-95%)
Units	51	5	10	4	70

Table 3.17b. Process measures of peritoneal dialysis care for renal units in the UK 2002, for adults

Process measures	England	Wales	Scotland	N. Ireland	UK
% of CAPD patients with disconnect (95% CI)	100% (100-100%)	98% (96-100%)	91% (87-95%)	96% (81-100%)	99% (99-99%)
Unit median (range)	100% (84-100%)	100% (40-100%)	100% (0-100%)	100% (94-100%)	100% (0-100%)
Units	49	5	10	4	68
% of PD patients on APD/CCPD (95% CI)	24% (23-25%)	19% (15-23%)	47% (42-52%)	65% (54-75%)	26% (25-27%)
Unit median (range)	19% (0-78%)	8% (0-97%)	48% (25-95%)	74% (51-86%)	26% (0-97%)
Units	49	5	10	4	68
% of PD patients on Erythropoietin (95% CI)	76% (75-78%)	83% (78-88%)	71% (67-76%)	74% (63-83%)	76% (75-77%)
Unit median (range)	77% (42-97%)	79% (67-94%)	74% (51-84%)	78% (67-86%)	76% (42-97%)
Units	44	4	10	4	62

Table 3.18a. Changes in process measures in England and Scotland 1995-2002, for adults

Process measures	England 1995	England 1998	England 2002	Scotland 1998	Scotland 2002
% of dialysis patients on hospital/ satellite HD	-	58%	69%	66%	76%
Unit median (range)	-	58%(30-100%)	71% (44-100%)	67% (40-77%)	77% (62-82%)
Units	-	52	52	11	10
% of HD patients on Erythropoietin (95% CI)	-	80% (79-81%)	89% (88-90%)	79% (76-81%)	92% (90-94%)
Unit median (range)	-	80% (10-99%)	91% (52-99)	80% (50-99%)	91% (88-98)
Units	-	51	45	11	9
% of HD patients on thrice weekly	82%	92%	96%	99.8%	99.4%
Unit median (range)	90% (10-100%)	96% (14-100%)	98% (64-100)	100% (99-100%)	99.6% (98-100%)
% of HD patients using					
standard membrane	29.50%	10%	0%	9%	0%
modified cellulose	45.50%	53%	29%	47%	30%
synthetic membrane	25%	37%	59%	45%	57%
high flux membrane	-	-	12%	-	13%
Units	47	50	51	10	10
% of CAPD patients with disconnect catheters	79%	93%	100%	100%	91%
Unit median (range)	92% (0-100%)	100% (0-100%)	100% (84-100%)	100% (100-100%)	100% (0-100%)
Units	46	52	49	11	10
% of PD patients on Erythropoietin (95% CI)	-	64% (63-66%)	76% (75-78%)	64% (59-68%)	71% (67-76%)
Unit median (range)	-	62% (10-100%)	77% (42-97%)	60% (25-90%)	74% (51-84%)
Units	-	51	44	10	10

Table 3.18b. Changes in process measures in Wales and Northern Ireland 1995-2002, for adults

Process measures	Wales 1995	Wales 1998	Wales 2002	N. Ireland 1998	N. Ireland 2002
% of dialysis patients on hospital/satellite HD	52%	59%	65%	83%	86%
Unit median (range)	56% (48-74%)	62% (56-69%)	64% (63-79%)	N/A	86% (82-89%)
Units	4	5	5	3	4
% of HD patients on Erythropoietin (95% CI)	-	87% (84-90%)	97% (95-99%)	87% (83-90%)	96% (95-98%)
Unit median (range)	-	88% (83-90%)	96% (92-100%)	N/A	98% (85-100%)
Units	-	5	4	3	4
% of HD patients on thrice weekly	77%	96%	92%	65%	89%
Unit median (range)	88% (53-98%)	99%(92-100%)	98% (85-100%)	N/A	88% (83-99%)
Units	5	5	5	3	4
% of HD patients using					
standard membrane	44%	0%	0%	0%	0%
modified cellulose	29%	17%	7%	86%	64%
synthetic membrane	27%	83%	83%	14%	11%
high flux membrane	-	-	11%	-	25%
Units	4	5	5	3	4
% of CAPD patients with disconnect catheters	64%	90%	98%	100%	96%
Unit median (range)	100% (46-100%)	100%(72-100%)	100% (40-100%)	N/A	100% (94-100%)
Units	5	5	5	3	4
% of PD patients on Erythropoietin (95% CI)	-	56% (50-61%)	83% (78-88%)	55% (44-66%)	74% (63-83%)
Unit median (range)	-	62% (29-100%)	79% (67-94%)	N/A	78% (67-86%)
Units	-	5	4	3	4

Table 3.19. Constraining factors of the responding adult units

Constraining factors	% of units				
	England	Wales	Scotland	N.Ireland	UK
Physical space	83	80	70	75	80
Capital funding	77	80	90	50	77
Nursing staff	69	60	80	75	70
Revenue funding	71	60	80	50	70
Provision of access	60	80	60	100	63
Junior posts	54	60	60	25	54
Surgical staff	44	20	50	75	45
Nephrology staff	46	40	50	25	45
Others	27	40	40	25	30

Table 3.20. Regional treatment rates 2002 p.m.p., for adults

Region/Country	Annual Acceptance (pmp)	Prevalence (pmp)
Anglia Oxford	75	539
North West	83	541
South West	93	554
Trent	93	618
S Thames	106	586
Northern Yorkshire	107	622
W Midlands	113	696
N Thames	113	782
England	98	615
Scotland	120	684
Wales	118	692
N. Ireland	109	657
UK	101	626

Table 3.21. Changes in regional treatment rates p.m.p. 1995-2002, for adults

Region/Country	Acceptances (pmp)			Prevalent patients (pmp)		
	1995	1998	2002	1995	1998	2002
N Thames	105	107	113	608	693	782
W Midlands	92	105	113	470	556	696
Trent	84	101	93	470	494	618
N Yorkshire	80	97	107	421	527	622
S Thames	76	92	106	420	495	586
South West	72	83	93	381	454	554
North West	84	79	83	441	489	541
Anglia Oxford	64	76	75	425	456	539
England	82	92	98	458	523	615
Wales	109	128	118	487	585	692
Scotland	-	105	120	-	546	684
N.Ireland	-	107	109	-	557	657
UK	-	96	101	-	529	626

Table 3.22. Regional units, facilities, and consultant numbers 1998-2002, for adults

	South West		Anglia Oxford		N Thames		S Thames		N Yorkshire		North West		Trent		W Midlands		England		Wales		Scotland		N. Ireland	
	1998	**2002**	1998	**2002**	1998	**2002**	1998	**2002**	1998	**2002**	1998	**2002**	1998	**2002**	1998	**2002**	1998	**2002**	1998	**2002**	1998	**2002**	1998	**2002**
No of units	7	**7**	5	**6**	8	**8**	6	**6**	10	**9**	5	**5**	4	**4**	7	**7**	52	**52**	5	**5**	11	**10**	3	**4**
No of satellites	13	**15**	4	**5**	11	**14**	7	**15**	11	**14**	13	**15**	7	**8**	7	**15**	73	**101**	4	**5**	5	**11**	1	**0**
HD stations pmp (main unit)	18	**21**	16	**24**	33	**33**	22	**22**	27	**35**	15	**17**	23	**26**	28	**35**	23	**26**	28	**33**	44	**50**	38	**65**
HD stations pmp (satellite unit)	16	**30**	7	**12**	26	**38**	8	**30**	12	**23**	16	**24**	13	**18**	24	**58**	15	**29**	16	**22**	5	**18**	6	**0**
WTE consultant Nephrologist pmp	2.8	**3.5**	1.8	**2.3**	3.4	**4.4**	3.5	**4.6**	2.9	**4.0**	2.6	**2.9**	2.2	**3.3**	3.4	**4.8**	2.8	**3.7**	2.3	**2.6**	3.5	**5.3**	4.7	**5.4**
No of RRT patients per WTE consultant		**157**		**236**		**176**		**128**		**154**		**185**		**189**		**146**		**165**		**257**		**129**		**121**
No of HD patients per station		**3.9**		**4.8**		**4.6**		**3.7**		**4.1**		**4.3**		**5.5**		**3.2**		**4.6**		**4.6**		**4.2**		**4.6**

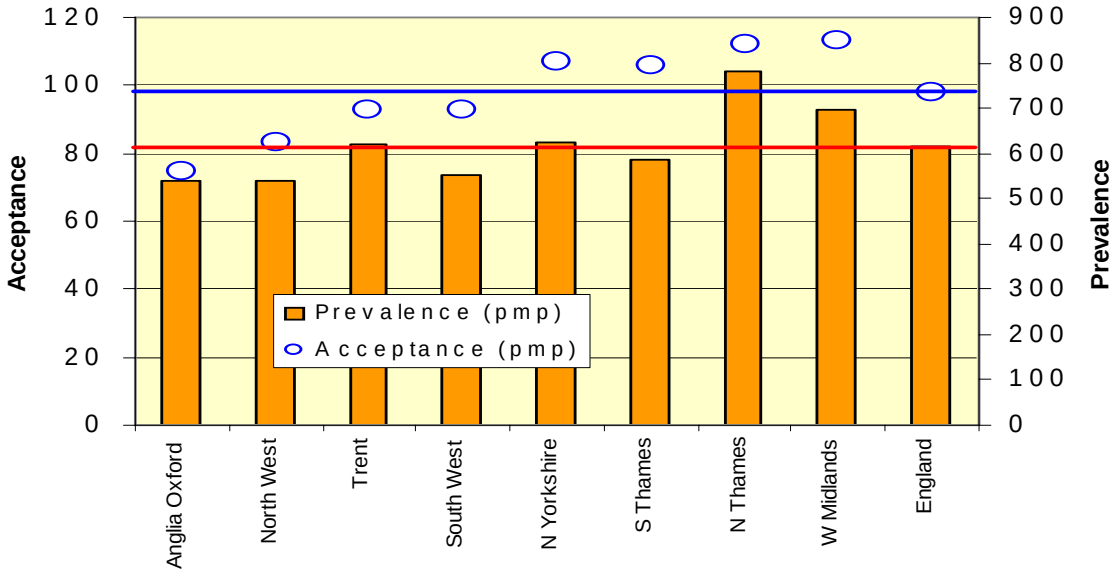

Figure 3.5. Annual acceptance and prevalence rates of RRT patients by region in England 2002

Prevalence of Hepatitis B and C, and HIV, in patients on renal replacement therapy.

Prevalence of Hepatitis B and C, and HIV (Table 3.23), was low amongst the patients receiving RRT in the UK in 2002. There were less than 2% of RRT patients who were Hepatitis C positive and less than 1% who were Hepatitis B or HIV positive.

Palliative care

Only 13 out of the 71 UK renal units had a dedicated palliative care team for renal patients. For units with such services, the number of patients using the service in 2002 ranged from 0 to 60 (Table 3.24).

Discussion

The RRT programme in the UK continues to expand. Although the annual acceptance rate grew slowly between 1998 (96 patients p.m.p.) and 2002 (101 patients p.m.p.), the prevalence rate increased from 526 patients p.m.p. in 1998 to 626 patients p.m.p. in 2002, a growth rate of around 4% per annum. In England, both the absolute and relative growth rates were greatest for haemodialysis patients, especially in satellite units. Of the 3,485 extra prevalent haemodialysis patients in 2002 compared with 1998, 72% were in satellite units. The number of satellite units had correspondingly increased by 38%, with the number of satellite-based haemodialysis stations increasing by 68% since 1998. The number of patients utilising home-based RRT (home haemodialysis or peritoneal dialysis) had for the first time decreased. The numbers on home haemodialysis decreased by 19%, and those on peritoneal dialysis by 10%, since the 1998 survey.

The regional variation in annual acceptance and prevalence rates seen in Tables 3.20 and 3.21 should be interpreted with caution as some regions, such as London have a high proportion of the population from ethnic minority groups, while others have a disproportionately elderly population, both resulting in the need for higher treatment rates than other regions. This is analysed in detail in Chapters 4 and 5.

Table 3.23. Prevalence of Hepatitis B and C, and HIV, in RRT patients in the UK 2002, for adults

	England	Wales	Scotland	N. Ireland	UK
No of Hep B patients (%)	274 (0.9%)	0	17 (0.5%)	7 (0.6%)	298 (0.8%)
% range	0-3	0	0-1	0-1	0-3
No of Hep C patients (%)	524 (1.8%)	4 (0.2%)	82 (2.4%)	7 (0.6%)	617 (1.7%)
% range	0-6	0-1	0-5	0-1	0-6
No of HIV patients (%)	136 (0.4%)	0	14 (0.4%)	7 (0.6%)	158 (0.4%)
% range	0-2	0	0-1	0-1	0-2

Table 3.24. Palliative Care services for renal units in the UK

	England	Wales	Scotland	N. Ireland	UK
No of units with a dedicated palliative team	10	1	1	1	13
No of patients who used a palliative care facility	206	2	30	6	244
Median no. of patients (range)	18 (0-60)	-	-	-	10 (0-60)

The profile of patients starting the RRT programme is also changing. The proportion of patients who were over 65 at the start of treatment increased to 50% in 2002. The percentage of patients with diabetic nephropathy as a primary diagnosis remained stable at 18%.

Cadaveric organ donor rates in the UK have fallen slightly in recent years from 1330 in 1998 to 1286 in 2002 (3% decrease). In contrast the number of live donor renal transplants had increased from 252 in 1998 to 372 in 2002 (48% increase), resulting in a 5% overall increase in the number of renal transplants in 2002.[5]

The number of patients with a functioning transplant in the UK continued to increase, but the proportion of prevalent RRT patients with a functioning transplant had reduced to 46% compared to 49% in 1998, 51% in 1995 and 53% in 1993. The proportion of patients with a functioning renal transplant is the result of the balance between the rate of annual acceptance of new patients, the proportion of those patients suitable for transplantation, the rate of renal transplantation, the rate of graft loss, and the death rate from the dialysis programme. UK Transplant, in conjunction with the Department of Health, is looking at ways to increase the transplant rate through establishing non-heart beating donor programmes, increasing organ donation rates from ITUs, and further increasing rates of live donation.

The UK Renal Registry has reported an annual rate of prevalent graft loss (due to graft failure and deaths) of 4.9%. The number of functioning transplants in Wales appeared to have fallen compared to the 1998 data. This is possibly due to problems with the 1998 survey data; transplants were overestimated due to duplicate notification from within the two renal units in the South Wales region. As both renal units now participate in the UK Renal Registry, it has been possible to validate these data and remove duplicate patients.

The size of both renal and satellite units varied considerably (Tables 3.8 and 3.9). In Scotland there were more main renal units and satellite units p.m.p. than England, partly as a result of the more widely scattered population. In the UK, 75% of the satellite units were directly funded and managed through the NHS. However, in

Wales, all the satellite units were commercially managed. The pattern of care in satellite units varied considerably, from units which had near permanent medical attendance to those which had infrequent regular visits from a doctor. Over half the main renal units in the UK in 2002 had satellite haemodialysis facilities (49/71), with yet more planned. Within the next three to four years 61 of the 71 units should have satellites. Some of the satellite units in England had a larger haemodialysis capacity than many of the main renal units, with up to 51 dialysis stations. With the predicted continual increase in patient numbers to 2020, consideration needs to be given in establishing these larger satellites as independent renal units with onsite medical support.

Although the number of the WTE consultant nephrologists p.m.p. in England increased, the number of dialysis patients had also increased, resulting in a similar ratio of dialysis patients per WTE consultant to that of 1998. Of the 4 countries, Northern Ireland had the highest number of WTE consultants p.m.p. and the lowest ratio of patients per WTE consultant. There had been a greater increase of non-consultant grade nephrology staff than the increase of trainee nephrologists.

The acceptance and prevalence rates are low in the UK, when compared to most other European countries (Chapter 22) and as patient numbers increase an even greater investment in human resources will be required.

Data regarding the trained and non-trained haemodialysis nursing staff are comparable with the data published by the British Renal Society in the report *The Renal Team: A Multi Professional Renal Workforce Plan for Adults and Children with Renal Disease*.[6]

Due to the more precise phrasing used in the 2002 survey questionnaire the data were not directly comparable with the 1998 survey. The role of non-trained nursing staff varied, with some units offering considerable responsibility such as involvement in needling fistulae and grafts, and also using a central venous catheter. Increased haemodialysis provision had been achieved through an increased number of HD stations, and by increasing the number of dialysis shifts.

Data regarding the members of multidisciplinary teams were also collected. The NSF for Renal services advised that patients approaching RRT should have a multi-skilled renal team available to them, to ensure adequate preparation both clinically and psychologically. The report *The Renal Team: A Multi Professional Renal Workforce Plan for Adults and Children with Renal Disease*,[6] outlined the personnel that constitute a multi-skilled renal team. The availability of the recommended renal team members varied between the units, with very few units having the full recommended complement.

The provision of facilities p.m.p. also showed considerable variation; this partly reflected the historical patterns of development in renal services.

Information on the processes of care showed an increased use of synthetic membranes and high flux membranes when compared with modified cellulose membranes, and virtually no standard cuprophane membranes were used. Some units were also adopting the use of haemodiafiltration (as recommended in the 3rd Renal Standards document) to reduce the risk of dialysis-related amyloidosis in patients on long-term dialysis who are unlikely to receive a transplant. Only 2 units in England were still reusing dialysers, one of which was planning to stop in 2003. All units were monitoring the dialysis adequacy for patients on haemodialysis on a regular basis, with the majority of units monitoring the adequacy every 3 months.

It is hoped that the publication of this renal survey's findings will help the NHS to gauge, plan and manage the continued expansion in provision of renal services that are projected till 2020[4].

Table 3.25. Changes in patient renal medical staff in England 1998-2002, for adults

	1998	2002	% increase
Consultant nephrologists WTE	139.7	188.4	35
Non-Consultant nephrologists	38	51	34
Trainee nephrologists	126	145	15
Dialysis Patients	13,405	16,394	22

Children

Introduction

The management of Established Renal Failure (ERF) in children is currently delivered by 13 specialist paediatric renal units in the UK. This survey commissioned by the Department of Health is the first survey conducted by the UK Renal Registry to collect data regarding the provision of paediatric renal services by these centres. However, the British Association for Paediatric Nephrology (BAPN) has been reporting its annual activities via the UK Renal Registry, and in 2002 they conducted a review of paediatric nephrology services in the UK. This survey will concentrate more on the service provision aspect, as the demographic details are covered in Chapter 14.

New paediatric patients starting Renal Replacement Therapy

The acceptance rate for new paediatric patients in the UK is 9 patients per million child population (p.m.c.p.; refers to those within the age groups quoted) and 15% of the new patients required dialysis as an emergency (Table 3.26). In contrast, the UK adult take on rate is 101 p.m.p and 34% required emergency dialysis. When analysed by age group, the highest acceptance rate is in the 10-14.99 years age group (12 p.m.c.p.) and only 1 patient is aged over 18 years (Table 3.27a). Whilst the majority of new paediatric patients were white (78%), 18% were of Indo-Asian origin (Table 3.27b). However, in adult services, 85% of new patients were white and only 7% were Indo-Asian.

Table 3.26. New patients accepted onto Renal Replacement Therapy (RRT) in 2002

	Total U.K
No of renal units	13
Patient numbers	120
Unit median (range)	8 (2-27)
Acceptance rate p.m.c.p. (95% C.I)	9 (7-10)
% Emergency	15%*

*Data from 12 units only

Table 3.27a. Profile of new patients – age groups

Age groups	Population (millions)	Number	Median (range)	Acceptance rate p.m.c.p.
0 - 4.99 years	3.4	28	2 (0-7)	8
5 - 9.99 years	3.7	26	2 (0-6)	7
10 - 14.99 years	3.9	45	3 (0-8)	12
15 - 17.99 years	2.3	20	1 (0-6)	9
18 - 18.99 years	0.7	1	N/A	1

Prevalent paediatric patients receiving Renal Replacement Therapy 31/12/2002

At the end of 2002, there were 827 paediatric patients receiving RRT. The size of the units varied from 20 to 159 patients. 74% of the patients had a functioning transplant, and of the dialysis patients 64% were on peritoneal dialysis. More detailed analyses are presented in Chapter 14.

Paediatric renal unit facilities

There were 13 paediatric renal units in the UK, 10 in England and one each in Wales, Scotland and Northern Ireland, equating to 0.9 units p.m.c.p. (Table 3.29). There were 8 paediatric transplant centres in England, 1 each in Scotland and Northern Ireland, and none in Wales. The median number of beds in each unit was 8, but one unit had no specific paediatric renal beds. The number of fixed haemodialysis (HD) stations varied from 0 to 7, with one unit having temporary

Table 3.27b. Profile of new patients - ethnicity

Ethnicity	Number	%	Range
White	94	78	7-17
Indo-Asians	22	18	1-9
African/Caribbean	1	1	0-1
Chinese	0	0	N/A
Others	3	3	0-2

Table 3.28. UK paediatric patients receiving Renal Replacement Therapy – December 31, 2002

	Total U.K
No of renal units	**13**
Patient numbers	**827**
Unit median (range)	**63 (20-159)**
Prevalence rate p.m.c.p. (95% C.I)	**59 (55-63)**
Haemodialysis	**76 (9%)**
Peritoneal dialysis	**138 (17%)**
Transplants	**613 (74%)**

Table 3.29. Paediatric renal unit facilities in the UK – 31/12/2002

	UK
Main Units	**13**
Units per million child population	**0.9**
Total beds	**107**
Unit no of beds median (range)	**8 (0-18)**
Beds per million child population	**7.6**
Haemodialysis	
Unit no of fixed stations median (range)	**5 (0-7)**
Fixed stations	**58**
Temporary stations	**6**
Total HD stations	**64**
Stations per million child population	**4.6**
Stations per unit	**4.9**
No of haemodialysis patients per station	**1.2**
HD shifts / week	**70**
Unit median (range)	**6 (3-8)**

haemodialysis station facilities only. The average unit had 4.9 stations with 1.2 HD patients using each station.

Staffing in paediatric renal units

In 2002, there were 47 consultant paediatric nephrologists, when nephrology sessions were taken into account this resulted in 39.3 WTE consultants. This equated to 3.4 consultant paediatric nephrologists p.m.c.p., and 2.8 WTE consultant paediatric nephrologists p.m.c.p. Each WTE consultant paediatric nephrologist provided care for 21 paediatric renal patients on RRT. In most of the transplant centres, the transplant services were shared with the adult renal services, hence making it difficult to separate the amount of work dedicated to paediatric renal services alone. The majority of the middle grades were specialist registrars,with very few clinical assistants, staff grades or research fellows (Table 3.30).

Compared with adult renal services, there were fewer consultant paediatric nephrologists per unit (3.6 per unit versus 4.4 per unit). Each WTE consultant paediatric nephrologist was on average responsible for 21 paediatric RRT patients and also undertakes many distant peripheral clinics.

At the end of 2002, 90% of funded trained nursing staff posts were filled, providing a ratio of 16.4 WTE trained nurses p.m.c.p. in the UK (Table 3.31). Most paediatric renal units had one dietitian and social worker (Table 3.32) but minimal IT support (0.1 WTE per unit). Of note, only 60% of social workers and 38% of teachers were NHS funded.

Table 3.30. Medical staffing in paediatric renal units in the UK 2002

Consultant nephrologists:			
Numbers	47		Nos
Number p.m.c.p.	3.4	Associate specialists	1
Average number per unit	3.6	Clinical assistants/Staff grades	2
WTE nephrology	39.3	Clinical/Research Fellows	2
WTE p.m.c.p.	2.8	Specialist Registrars (LAT/NTN)	26
Average WTE per unit	3.0	SHO/Trust grade doctors	19
No of RRT pts per consultant	18		
No of RRT pts per WTE consultant	21		

Table 3.31. Nursing staff in paediatric renal units in the UK 31/12/2002

	UK
Nursing Staff:	
WTE available funding	254.5
Actual WTE in post (and %)	229.7 (90)
WTE per million population	16.4
No. of units	13
Median (range)	18 (4-39)
% of nurses with ENB qualification	26%
Ratio of nurses to main unit HD patients	3.0
Ratio of nurses to non nursing trained staff	23.0
Non nursing trained staff:	
WTE available funding	11.3
Actual WTE in post (and %)	10 (88)
WTE per million population	0.7
No. of units	13
Median (range)	0.6 (0-3)

Processes of care in paediatric nephrology

In 2002, 36% of the paediatric dialysis patients were on hospital haemodialysis. 82% were dialysed in 3-5 hour sessions, with only 9% having twice weekly sessions of haemodialysis. The majority of these patients were on twice weekly HD because of preserved renal function, but geographical problems were the other major reason for not having three times a week HD. 80% of the patients were haemodialysing using synthetic membranes and all were on erythropoietin (EPO) (Table 3.33a).

The majority of patients on peritoneal dialysis were on either APD or CCPD (86%). Of the patients on CAPD, 94% were using the disconnect system. Once more, a high percentage of patients were on EPO (96%) (Table 3.33b).

Table 3.32. Professions allied to medicine staffing in the UK 2002

	Dietitians	Social Workers	Technicians	Counsellors	Physios	IT support members	Pharmacists	Play specialists	Teachers
Numbers WTE	12.0	10.9	20.1	5.3	0	1.9	5.7	10.2	7.6
% NHS	96%	60%	100%	100.0%	-	100%	100%	100%	38%
Average per unit	0.9	0.8	1.5	0.4	-	0.1	0.4	0.8	0.6

Table 3.33a. Process measures of haemodialysis care for paediatric renal units in the UK

	UK
Process measures	
% of dialysis patients on hospital HD	36%
Unit median (range)	40% (6-64%)
Units	13
% of HD patients on Erythropoietin (95% CI)	100% (95-100%)
Unit median (range)	100% (100-100%)
Units	12
% of HD patients on twice weekly	9%
Unit median (range)	0% (0-50%)
Units	13
Reasons for twice weekly:	
Geographical reasons	21.4%
Preserved renal function	78.6%
Financial restrictions	0.0%
Lack of facilities	0.0%
Others	0.0%
Prescribed time on HD	
3-5 hours	82%
Unit median (range)	100% (33-100%)
Units	13
% of HD patients using: (95% CI)	
Standard membrane	0% (0-5%)
Modified cellulose	20% (11-30%)
Synthetic membrane	80% (70-89%)
High flux membrane	0% (0-5%)
Units	13

Table 3.33b. Process measures of haemodialysis care for paediatric renal units in the UK

	UK
Process measures	
% of CAPD patients with disconnect (95% CI)	94% (71-100%)
Unit median (range)	0% (0-100%)
Units	12
% of PD patients on APD/CCPD (95% CI)	86% (77-95%)
Unit median (range)	96% (50-100%)
Units	12
% of PD patients on Erythropoietin (95% CI)	96% (93-99%)
Unit median (range)	100 (80-100)
Units	12

Factors restricting development of paediatric renal services

All units responded to this question. The main factors restricting development of the paediatric renal services in the UK were similar to those mentioned by the adult renal units, although funding (capital and revenue) was more of an issue for the adult services. Other specific problems mentioned were difficulties transferring the childrens' care to the adult services, and the impact of the reduction in junior doctors' hours on service provision in what is a very specialised field (Table 3.34).

Table 3.34. Constraining factors of the responding units

Constraining factors	% of units
Nursing staff	77%
Space	54%
Revenue funding	46%
Capital funding	31%
Nephrology staff	23%
Junior posts	23%
Surgical staff	15%
Provision of access	15%
Other	23%

Discussion

The number of new paediatric patients starting RRT each year in the UK has remained largely unchanged since 1996. The prevalent number of paediatric RRT patients in the UK has also remained stable, with a total number of 827 patients at the end of 2002. Of the paediatric RRT patients, 74% had a functioning transplant, and of the dialysis patients 64% were on peritoneal dialysis. This was in contrast to the adult patients where 46% had a functioning transplant, and only 27% of dialysis patients were on peritoneal dialysis. The proportion of paediatric patients requiring dialysis as an emergency was just less than half that of the adult population (15% versus 34%). A higher proportion of the new patients were Indo-Asian compared with in the adult renal units (18% versus 7%). This has implications for those reaching the adult nephrology service, and in particular dialysis, because of issues regarding transplant availability.

The data regarding numbers of doctors, nurses and other professions allied to medicine in the paediatric renal units in the UK wFere consistent with those published by the British Renal Society in their report: *The Renal Team: A Multi Professional Renal Workforce Plan for Adults and Children with Renal Disease*[6], although there had been an increase since its release. An international comparison showed that the UK had a lower ratio of consultant paediatric nephrologists p.m.c.p. compared to America[8] and some of the other European

countries[9], and the BAPN recommendations from 2001 of 68 WTE consultants remained unmet. There had however been an increase in the number of trainees from 15 to 27, which may help alleviate this shortfall. The Workforce Planning document recommended that the minimum number of consultants required to deliver the clinical service, comply with the European working time directive and ensure that non-clinical activities are fulfilled, is at least 5 WTE per unit. The survey has shown that in 2002 the UK falls short of this target with 3.0 WTE per unit.

The BAPN also made recommendations regarding the minimum number of other allied professions needed for each paediatric renal unit[7] and most of the centres still needed to reach these levels. Of note, paediatric nephrology wards should be managed by a registered children's nurse with the ENB147/136 qualification on a daily basis, but in 2002 only 26% of nursing staff had this qualification.

The main constraining factor to future development and expansion of paediatric renal services in the UK, as reported by the renal units, was the staffing of nursing posts. This was in contrast to the adult renal services where funding issues were thought to be a more prominent problem. Plans are afoot within the paediatric nephrology service to try to both attract and retain nursing staff.

Collation of this dataset will hopefully provide units with increased power when in negotiation with their commissioners, and enable the continued regular follow up of both service provision and manpower within nephrology in the UK.

The data in the paediatric section has not been fully reviewed by the BAPN and a full report will be published with the finalised DOH survey.

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