Chapter 15: Elderly Patients on Renal Replacement Therapy

Summary

- The median age of incident patients has risen in the last 20 years to 64.8 years, although there has been no increase in the last 3 years.
- Twenty-two percent of new patients starting RRT were $\geqslant$75 years old and 12% of all prevalent patients were $\geqslant$75 years old.
- In the elderly, reno-vascular disease (18%) was the most common identified cause of established renal failure. Diabetic nephropathy was the cause in only 8% of those over 74. 'Uncertain' diagnosis was frequent (22% in 65–74 yrs age group; 31% in $\geqslant$75 years).
- Older patients more often had co-morbidity present at the start of dialysis than those under 65 (67% and 54% respectively, $p < 0.0001$), but there was not an increased burden of co-morbidity in those of 75 and over compared with those of 65–74, indeed some co-morbidities were significantly less common in that age group.
- Survival falls progressively with increasing age: 1 year after 90 day survival in 75–79 year olds was 74% compared with 57% in those aged $\geqslant$85 ($p < 0.001$).
- At 1 year after 90 days, treatment withdrawal was the commonest cause of death in the very elderly patients (27%): it was twice as common as a cause of death in the older patients than those aged 65–74 years ($p < 0.05$). Otherwise in both the elderly age groups cardiac death was most common (65–74 – 27%; $\geqslant$75 – 22%), followed by infection.
- Only 8% of patients aged $\geqslant$75 have a functioning renal transplant compared with 29% of those in the 65–74 years age group and 57% of those <65 years. 78% of patients aged $\geqslant$75 years were on HD compared with 30% <65 years. PD usage was similar in the three age cohorts (14%, 17%, and 14%).
- Patients aged $\geqslant$75 years were significantly less likely to be in the highest quintile of Townsend scores, ie less likely to be deprived.
- In achievement of the Renal Association Standard for haemoglobin the elderly do at least as well as the young.
- Systolic BP Standards were achieved less often in the elderly but diastolic more often: there was little difference between the two elderly age groups.
- A lower percentage of younger dialysis patients achieved the RA Standards for serum phosphate than of the elderly age groups (<65 years – 54%, 65–74 years – 67%, $\geqslant$75 years – 73%; $p < 0.0001$), with the most elderly significantly the highest in achievement. Achievement of the serum calcium Standard was similar in all ages.

Introduction

With increasing numbers of patients on renal replacement therapy (RRT), the median age of incident patients has risen in the last 20 years to 64.8 years, although there has been no increase in the last 3 years (Table 15.1). The proportion of incident patients aged over 75 increased from 17.6% in 1998 to 22.3% in 2003.

The median age for all prevalent RRT patients has increased from 54.3 years in 1998 to 56.0 years in 2003. As expected, the median age was lowest for the transplant patients, followed by PD patients, with the HD patients having the highest median age. The median age for patients on PD has shown a trend to decrease whereas the median age for haemodialysis patients has increased from 62.6 years to 64.3 years (Table 15.2).

With the aged general population increasing it was not surprising that the largest growth has been seen in the over 65 age group. Prevalent RRT patients were also surviving longer (see

Table15.1: Median age and percentage of incident patients over 75 in England and Wales 1998–2003

Year	Median age	% over 75
1998	63.0	17.6
1999	63.0	18.3
2000	64.0	21.2
2001	64.8	21.0
2002	65.5	23.5
2003	64.8	22.3

Table 15.2: Median age of treatment modalities for England and Wales 1998–2003

	Transplants	PD	HD	All
Median age 2003	49.3	58.0	64.3	56.0
Interquartile range	39–60	45–69	50–74	43–68
Range between units	40–57	49–65	56–72	51–65
Median age 2002	49.6	58.3	64.5	55.9
Median age 2001	48.9	58.7	64.0	55.1
Median age 2000	48.9	58.6	63.5	54.9
Median age 1999	48.9	58.8	62.7	54.6
Median age 1998	49.0	58.9	62.6	54.3

Report 2003). The recent stability in incident patients of the median age and proportion aged over 75, while acceptance rates continue to increase, may in part be due to the recently increased provision of supportive care teams for those not wishing to undertake dialysis.

Increasingly elderly patients carry associated co-morbidity, in particular cardiac disease and as a consequence a need for more medical care and a potential for reduced survival. As many of the elderly patients are unfit for transplantation they remain on dialysis, usually haemodialysis, which brings with it issues regarding cost, vascular access difficulty, and hospitalisation.

In this chapter on older patients on RRT in the UK, 'elderly' was defined as 65 years and more: patients have been analysed in two groups, 65–74 years and $\geqslant$75 years. These elderly patients were also compared with those less than 65 years. Patients have been analysed by renal centre for primary renal diagnosis, ethnic origin, associated co-morbidity, treatment modality, dialysis adequacy, achievement of Renal Association standards, causes of death and survival. The incident and prevalent cohorts have been analysed separately.

Methods

The incident patient cohort included all those patients starting RRT since the beginning of 1997 until the end of 2003, while prevalent patients included all those alive on RRT on December 31st 2003. Chi-squared and Fisher's exact tests were used for statistical analyses, with Kaplan-Meier for survival.

Survival analysis of incident patients was at 90 days and 1 year after 90 days. Ninety-day survival analysis included all those patients starting RRT from 1997 to September 30th 2003 and one year after 90 days survival analysis included all those patients starting RRT from 1997 to September 30th 2002.

Incident Patients

The proportion of elderly patients starting RRT in each centre is shown in Table 15.3. As numbers were relatively small in each centre per year, they were aggregated for the last 3 years to give more meaningful figures (Table 15.3). In the last three years in E&W, the proportion of incident patients over 75 years remained stable (21% – 2001, 24% – 2002, 21% – 2003). In those centres with the last three years data available, the proportion of incident patients over 75 years varied from around 15% to 35%. This may be due to differences in the demography of the local population, referral and acceptance policies, or availability of treatment facilities.

Primary renal diagnosis

In contrast with patients under 65, in whom diabetes (DM) is the most common diagnosis (21%) and reno-vascular disease (RVD) relatively uncommon (8%), in the age group 65 to 74 years, reno-vascular disease (18%) was the most common identified cause of established renal failure, with diabetes 17% (Figure 15.1, Table 15.4). However in those aged 75 or more, RVD was the commonest identified cause of established renal failure (31%) with diabetes only 8% and polycystic disease (2%). These differences were all statistically significant ($p < 0.001$). In both older groups the majority of patients were of 'uncertain' diagnosis (22% in the 65–74 yrs age group; 31% in $\geqslant$75 years),

Table 15.3: Proportion of incident patients aged ⩾75 in each unit in 2001–2003

Treatment centre	% ⩾75 yrs	No ⩾75 yrs
Bradford	15	30
Sheffield	16	73
Sunderland	17	25
Cambridge	18	51
Middlesbrough	18	53
Preston	18	62
Stevenage	18	58
Guys	19	64
Leicester	19	97
Portsmouth	19	81
Carshalton	21	103
Liverpool	21	91
Leeds	21	97
Wordsley	21	21
Nottingham	22	68
Wolverhampton	22	58
Wrexham	22	24
Cardiff	23	108
Reading	24	42
Carlisle	25	21
Hull	25	63
Oxford	25	126
Coventry	26	70
Heartlands	28	68
Swansea	29	102
Truro	29	41
Bristol	30	132
Southend	30	34
Gloucester	31	50
Plymouth	31	67
York	32	52
Exeter	35	97
H&CX**	17	55
Newcastle**	19	37
Kings**	20	46
Bangor**	25	17
Wirral**	29	25
Ipswich**	30	23
Clwyd**	36	10
Derby*	15	9
Hope*	16	23
England	**22**	**2,113**
Wales	**25**	**261**
E&W	**22**	**2,374**

*One year data (2003).
**Two year data (2002–03).

reflecting the large numbers who were referred with small kidneys.

Ethnicity

Considering only those centres with ⩾75% complete returns (all three age groups, n = 10,859), the ethnic distribution of incident patients by age was analysed in the three age groups (Table 15.5). In both elderly age groups the majority of patients were White (95% in ⩾75 years, 89% in 65–74 years), but with significantly fewer ethnic minority patients in the ⩾75 years cohort ($p < 0.001$): the difference was largely in the South-Asian and African-Caribbean cohorts.

It was known that the median age of South-Asians and African-Caribbeans starting RRT is lower than that of Caucasians (Chapter 4), reflecting the younger median age of the ethnic minority population within the UK as a whole. The potential need for RRT in the elderly in the ethnic minorities was not otherwise identified.

Co-morbidity

Considering only those centres with ⩾75% complete returns (all three age groups, n = 4,122), co-morbidity was compared in the three age groups. Not surprisingly, significantly more of the elderly had co-morbidity present at the start of dialysis than those under 65 (67% and 54% respectively, $p < 0.0001$).

Cardiac disease was the most common co-morbidity present in total, but in those under 65 smoking was the most common co-morbidity (Figure 15.2). Those aged <65 years were significantly more likely to be current smokers at the start of RRT (20%) when compared with the other two groups (65–74 years – 16%; ⩾75 years – 11.5%, $p < 0.0001$) but COPD was more common in the elderly (65–74 years – 11%; ⩾75 years – 10%) than younger patients (7%, $p < 0.0001$), suggesting many older patients may be ex-smokers (Table 15.6). Diabetes as a co-morbidity in patients with other causes of renal failure was twice as common in the elderly than the younger group (10% compared with 5%, $p < 0.0001$).

Perhaps unexpectedly there was not an increased burden of co-morbidity in those of 75

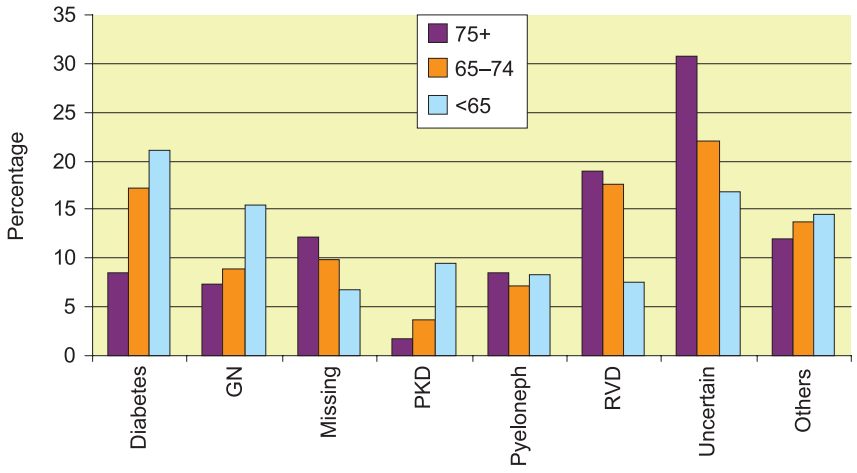

Figure 15.1: Primary renal diagnosis in incident patients in different age groups

Table 15.4: Primary renal diagnosis in incident patients in different age groups

Age	Diabetes	GN	PKD	Pyelonephritis	RVD	Uncertain
<65	21.2% (1,909)	15.4% (1,395)	9.4% (852)	8.2% (746)	7.6% (688)	16.8% (1,519)
65–74	17.1% (838)	8.8% (429)	3.8% (184)	4.1% (345)	17.5% (856)	22.1% (1,076)
⩾75	8.4% (313)	7.2% (271)	1.8% (68)	8.5% (317)	31.3% (704)	30.8% (1,145)

( ) = number of patients.

Table 15.5: Ethnicity in incident patients by age

Age	South-Asian	African-Caribbean	Chinese	Other	White
⩾75	2.6% (58)	1.2% (27)	0.3% (6)	1.3% (30)	94.5% (2,090)
65–74	5.9% (176)	3.5% (105)	0.4% (13)	1.3% (38)	88.8% (2,644)
<65	9.4% (538)	4.4% (248)	0.5% (27)	1.8% (102)	83.8% (4,757)

( ) = number of patients.

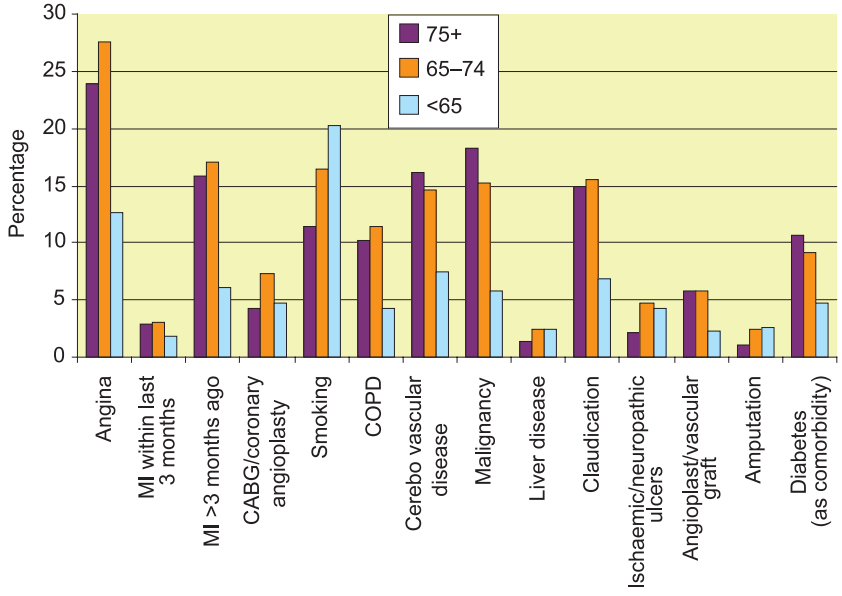

Figure 15.2: Co-morbidities in different age groups

Table 15.6: Co-morbidity by age group

	<65		65–74		75+		
Co-morbidity	**No.**	**%**	**No.**	**%**	**No.**	**%**	**P-value**
Angina	266	13	323	28	200	24	<0.0001
MI within last 3 months	38	2	35	3	24	3	0.0559
MI >3 months ago	127	6	198	17	132	16	<0.0001
CABG/coronary angioplasty	89	5	78	7	31	4	0.0023
Smoking	406	20	183	16	92	11	<0.0001
COPD	89	4	134	11	85	10	<0.0001
Cerebro vascular disease	157	7	171	15	135	16	<0.0001
Malignancy	123	6	179	15	152	18	<0.0001
Liver disease	52	2	29	2	11	1	0.1343
Claudication	143	7	182	16	124	15	<0.0001
Ischaemic/neuropathic ulcers	89	4	56	5	18	2	0.0084
Angioplasty/vascular graft	48	2	68	6	48	6	<0.0001
Amputation	56	3	29	2	9	1	0.0311
Diabetes (as comorbidity)	97	5	106	9	89	11	<0.0001

and over compared with those of 65–74, indeed some co-morbidities were significantly less common in this age group, namely smoking ($p = 0.002$), ischaemic ulcers ($p = 0.002$), amputation ($p = 0.02$) and previous CABG/coronary angioplasty ($p = 0.005$). There were no co-morbidities significantly more common in this age group compared with the 65–74 group. This may reflect screening procedures for fitness for dialysis, or choice by many elderly and frail patients to take the supportive care option. There may be an increase in other co-morbidities not recorded by the Registry in the very elderly and the role of selection by survival to the start of RRT was unclear.

Survival

Using Kaplan-Meier methodology, survival was analysed at 90 days and for 1 year after 90 days (Figures 15.3 and 15.4). Incident patients aged <65 were compared with those aged 65–74 and ⩾75: the latter were split further into 5 year age bands.

Over the first 90 days, survival fell progressively with increasing age, such that those patients starting RRT aged ⩾85 had a 72% chance of being alive compared with 83% in those aged 75–79. This was significantly lower than the survival of those aged <75 (65–74 years – 87%; <65 years – 95%). The survival

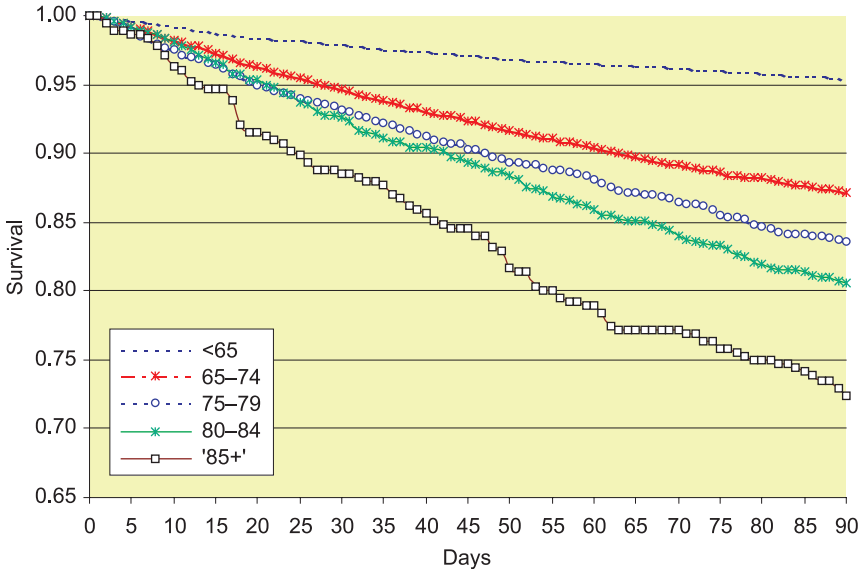

Figure 15.3: Kaplan-Meier survival by age group (90 days)

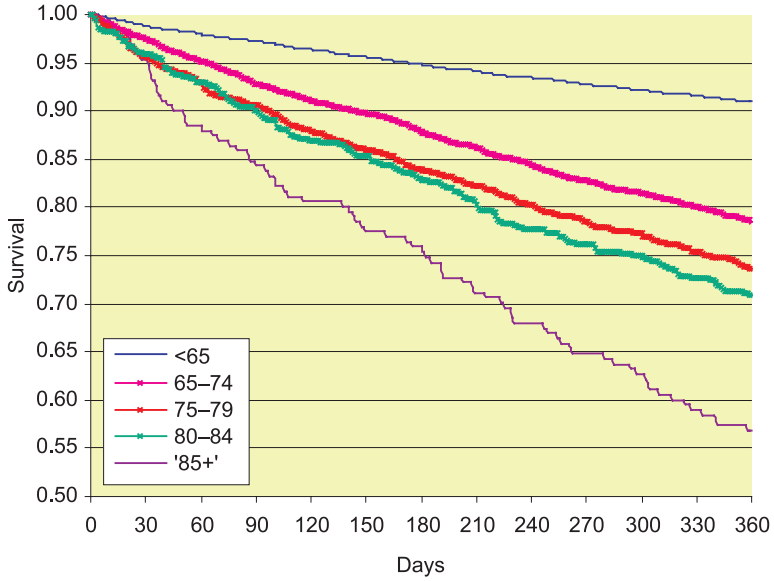

Figure 15.4: Kaplan-Meier survival by age group (1 year after 90 days)

advantage in patients aged 75–79 over those aged 80–84 was only 3% by the end of day 90 and 9% over those aged 85 or more.

This pattern was repeated during the year after 90 days (Figure 15.4). The patients aged 65–74 had a 78% chance of being alive at 1 year after 90 days compared with 73.5% in those aged 75–79, 71% in those aged 80–84 and 57% in those aged 85 or more ($p < 0.001$).

Cause of Death

The cause of death in those elderly patients where it had been recorded ($n = 660$) was analysed and grouped into the following categories: cerebrovascular accident, treatment withdrawal, cardiac disease, infections, malignancy, uncertain/not determined and 'other'. During the first 90 days, death from cardiac disease was the commonest cause in both elderly age groups (65–74 – 32%; ⩾75 – 24%, Figure 15.5). Treatment withdrawal was almost twice as common as a cause of death in those aged ⩾75 than in the other age groups, which were similar (19% v 10% and 9% respectively, $p < 0.05$). Infection was the second most common cause of death in both elderly groups (65–74 – 20%; ⩾75 – 21%). Malignancy accounted for only 6% of deaths in those ⩾75 years. This low percentage may be explained by the high percentage of treatment withdrawals in the same

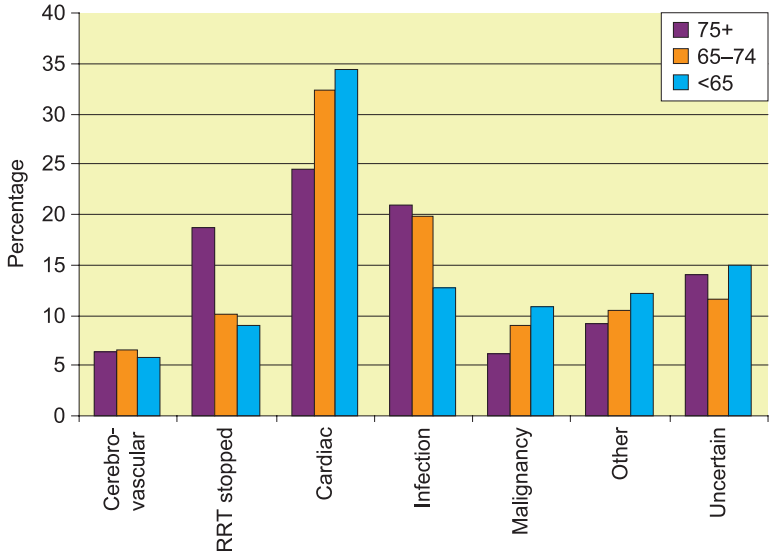

Figure 15.5: Cause of death at 90 days in three age groups

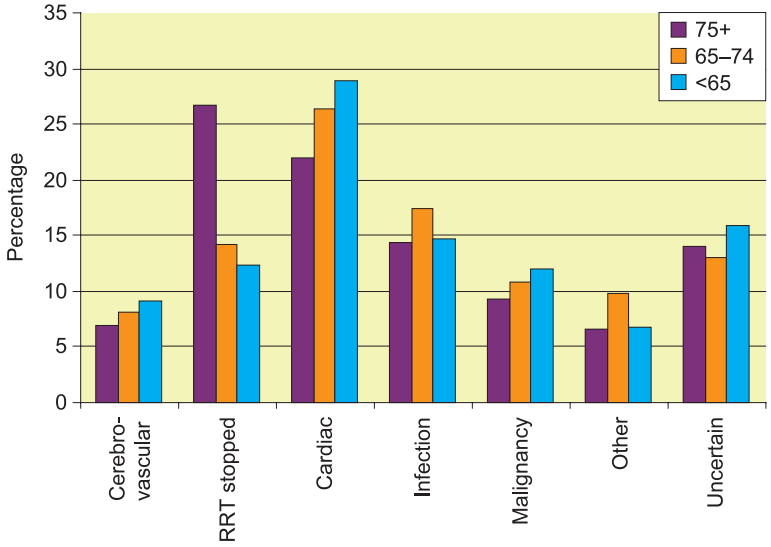

Figure 15.6: Cause of death in 1 year after 90 days in three age groups

group, where the factors prompting withdrawal are undeclared.

At 1 year after 90 days (Figure 15.6), the patterns were similar to those at 90 days, with large numbers of patients in both the elderly age groups dying from cardiac disease (65–74 – 27%; ⩾75 – 22%), but treatment withdrawal became the commonest cause of death in the very elderly patients (27%). It was twice as common as a cause of death in the older patients than those aged 65–74 years ($p < 0.05$).

There was no difference in the causes of death up to 3 years compared with 3–5 years within the two elderly age groups. Treatment withdrawal remained more common in the very elderly at both up to 3 and 3–5 years (23% and 27% in those ⩾75; 12% and 14% in those 65–74, $p < 0.0001$).

Prevalent Patients

The proportion of prevalent patients aged ⩾75 has increased slowly over the last six years; although many patients of this age are starting RRT, they are of course dying more quickly than younger patients. The proportion of prevalent patients aged ⩾75 years was 9% in England in 1998 and has risen to 12% in 2003 (Figure 15.9). In Wales from a lower start (7%) there has been a larger increase to 13%, but numbers are small. Guy's, Newcastle and Sunderland had the lowest proportion of patients aged ⩾75 years (7%) while York and the Wirral units had the highest (22%) (Table 15.7).

Treatment Modality

There were large differences in modality type between the age groups (Figure 15.8) with more elderly patients on haemodialysis (⩾75 years – 78%, 65–74 years – 54% and <65 years – 30%, $p < 0.0001$). Patients in the older age groups are not receiving transplants (⩾75 years – 8%, 65–74 years – 30%, <65 years – 57%; $p < 0.0001$), probably as a consequence of co-morbidity making them unsuitable candidates. Within the two elderly age groups, the 65–74 years group had fewer patients on haemodialysis (53% vs. 78%) and more patients on

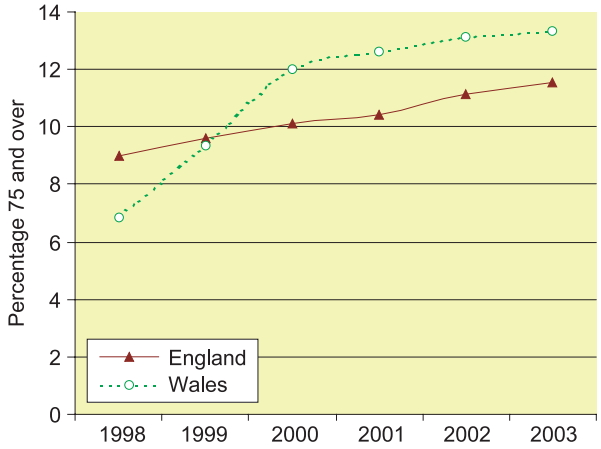

Figure 15.7: Percentage of prevalent RRT patients aged ⩾75, England and Wales 1998–2003

Table 15.7: Proportion of prevalent patients aged ⩾75 in 2003

Centre	No. 75+	% 75+
Bangor	20	21
Bradford	29	9
Bristol	158	15
Cambridge	69	9
Carlisle	22	13
Carshalton	92	10
Clwyd	13	19
Coventry	65	11
Cardiff	128	11
Derby	59	21
Exeter	96	18
Gloucester	48	19
Guys	87	7
H&CX	117	11
Heartlands	86	17
Hope	52	9
Hull	77	15
Ipswich	35	15
Kings	66	11
Leicester	111	10
Liverpool	102	8
Middlesbrough	62	11
Newcastle	52	7
Nottingham	93	11
Oxford	153	11
Plymouth	52	13
Portsmouth	115	11
Preston	73	10
Leeds	116	9
Reading	43	19
Sheffield	103	9
Stevenage	83	15
Southend	41	21
Sunderland	19	7
Swansea	71	16
Truro	48	20
Wirral	35	22
Wolverhampton	63	16
Wordsley	33	13
Wrexham	29	14
York	44	22
England	**2,599**	**12**
Wales	**261**	**13**
E&W	**2,860**	**12**

peritoneal dialysis (PD) and transplants (Tx) (PD: 17% vs. 14%; Tx: 30% vs. 8%). These differences were statistically significant ($p < 0.0001$).

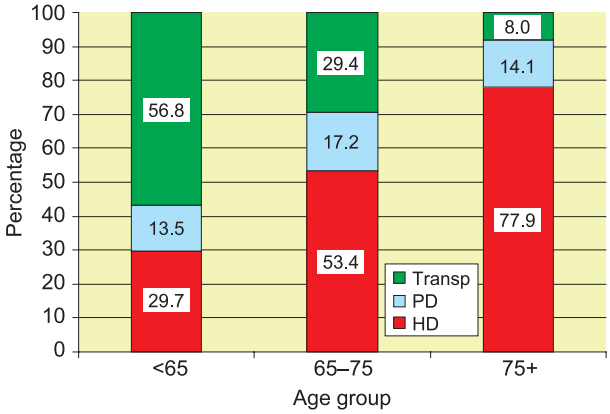

Figure 15.8: Treatment modalities in three age groups

Ethnicity

Ethnic breakdown in the prevalent population reflected patterns found in the incident cohort (Table 15.8). The majority of patients in both elderly age groups were White (⩾75 years – 91%, 65–74 years – 85%). When compared with the 65–74 years age group, there were fewer ethnic minority patients in the ⩾75 years cohort ($p < 0.0001$). This difference was largely seen in the South Asian (3.5%) and African-Caribbean cohorts (3%).

Within ethnic groups, the proportion aged ⩾75 varied. Whilst 12% of Whites on RRT were aged ⩾75, only 6% of South Asians and 8% of African-Caribbeans were in this age group.

Social Deprivation

The Townsend index was used as the scoring system for social deprivation, which was derived from the patient's postcode. The Townsend index (calculated from the 2001 Census data) is a composite measure of deprivation based on total unemployment rate, no car households, overcrowded households and not owner occupier households based on the electoral ward as at the 2001 Census. The higher the Townsend index, the greater is the deprivation.

Using the Townsend score, social deprivation was analysed in the three age groups (Table 15.9) and the Townsend scores were grouped into quintiles. Using the Chi-squared test, a difference was seen between the three age groups and the Townsend score distribution ($p < 0.0001$).

Table 15.8: Ethnicity of prevalent patients on RRT in three age groups

	Ethnic Groups					
Age	South Asian	African-Caribbean	Chinese	Other	White	Total
⩾75	3.5% (65)	3.0% (54)	0.4% (7)	2.6% (44)	91.0% (1,700)	1,870
65–74	7.0% (221)	5.0% (155)	0.5% (17)	2.0% (70)	85.0% (2,718)	3,181
<65	7.5% (872)	4.0% (501)	0.5% (60)	3.0% (367)	85.0% (9,795)	11,595

( ) = number of patients.

Table 15.9: Social deprivation score in three age groups

	Townsend quintile score					
Age	1	2	3	4	5	Total
⩾75	19% (541)	21% (583)	20% (567)	22% (612)	18% (522)	2,825
65–74	19% (872)	21% (995)	19% (862)	21% (956)	20% (964)	4,649
<65	18% (2,940)	19% (3,212)	18% (3,042)	22% (3,644)	23% (3,755)	16,593

( ) = number of patients.

Renal Association Standards

The Renal Association sets standards for a number of laboratory variables against which the Registry audits the reporting renal units. This year a selection of variables were analysed to assess results in the elderly. Because of the small number of patients aged ⩾75 years with a functioning renal transplant, only results from those on dialysis were analysed.

Haemoglobin

All established patients on RRT should achieve a haemoglobin of ⩾10 g/dl. The elderly do at least as well as the young (Table 15.10). Between the two elderly groups there was no significant difference in the percentage of patients achieving the standard for haemoglobin ($p = 0.39$). This was also true for both dialysis modalities ($p = 0.25$ for HD and PD).

The median Hb was similar in both elderly groups on dialysis (11.5 g/dl) but was higher in those on PD (11.9 g/dl) than HD (11.4 g/dl). Considering haemoglobin in those aged ⩾75 years by 5-year age bands (75–79, 80–84, and 85+) there was no difference in the proportion achieving desirable levels on dialysis (85%, 84%, 87%, $p = 0.5$). The same was true of HD and PD patients analysed separately.

Blood Pressure

The Renal Association blood pressure Standard for patients on PD and post HD is set at <130/80 mmHg.

For systolic BP, <50% of patients on dialysis achieved the Standard, irrespective of modality or age group. Comparing the three age groups, older dialysis patients had significantly worse performance rates ($p = 0.009$), but within the two elderly groups no difference was seen (⩾75 years – 45%, 65–74 years – 41%, $p = 0.1$) (Table 15.11). For HD patients the trends were similar. In patients on PD, no difference was seen between the age groups (⩾75 years – 32%, 65–74 years – 34%, <65 years – 38%; $p = 0.13$).

Table 15.10: Percentage haemoglobin ⩾10 g/dl by age and dialysis modality

	All dialysis		Haemodialysis		Peritoneal dialysis	
Age	<10	10+	<10	10+	<10	10+
⩾75	15%	85%	16%	84%	9%	91%
65–74	16%	84%	18%	82%	11%	89%
<65	18%	82%	20%	80%	14%	86%

Table 15.11: Proportion achieving BP Standards by age and modality

	All dialysis		Haemodialysis		Peritoneal dialysis	
Age	Systolic <130	Diastolic <80	Systolic <130	Diastolic <80	Systolic <130	Diastolic <80
⩾75	42%	79%	43%	81%	32%	63%
65–74	45%	74%	48%	79%	34%	55%
<65	47%	58%	50%	63%	39%	43%

Median systolic blood pressure readings were 131 mmHg, 132 mmHg and 134 mmHg respectively in three age groups (<65 years, 65–74 years and ⩾75 years).

Diastolic control was better than systolic control in all age groups. Between the two elderly groups, the diastolic control was statistically better in the ⩾75 years age group (⩾75 years – 79%, 65–74 years – 74%; p = 0.002). Median diastolic readings however were lower in those aged ⩾75 years (67 mmHg) when compared with the other two groups (65–74 years – 69 mmHg, <65 years – 75 mmHg).

In those aged ⩾75 years, blood pressure was further analysed to see if there were any differences with increasing age. In 5-year age band intervals, systolic and diastolic blood pressure control was no different with increasing age, irrespective of modality.

Serum Phosphate and Calcium

The Renal Association standards document recommends a serum phosphate level of <1.8 mmol/L. A lower percentage of younger dialysis patients achieved the RA ideal values than in the elderly age groups (<65 years – 54%, 65–74 years – 67%, ⩾75 years – 73%; p < 0.0001) (Figure 15.9). A similar pattern was seen in patients on HD (51%, 64% & 71% respectively, p < 0.0001) or PD (62%, 76% & 83% respectively, p < 0.0001). Significantly more of the most elderly population achieved the RA Standard in both treatment modalities (p < 0.01).

In the ⩾75 years group, the cohort was further analysed in 5-year age bands (75–79, 80–84, 85+) to see if there were further differences in serum phosphate amongst the older patients. There was a suggestive trend towards lower serum phosphate with increasing age which did not reach statistical significance (Table 15.12) (Figure 15.10).

Phosphate control in the elderly may be better because of a reduced dietary intake since phosphate levels are known to mirror protein intake. The median phosphate fell with increasing age band, from 1.5 mmol/L in patients aged 75–79 to 1.39 mmol/L in those aged 85 or more on dialysis and was similar across modalities.

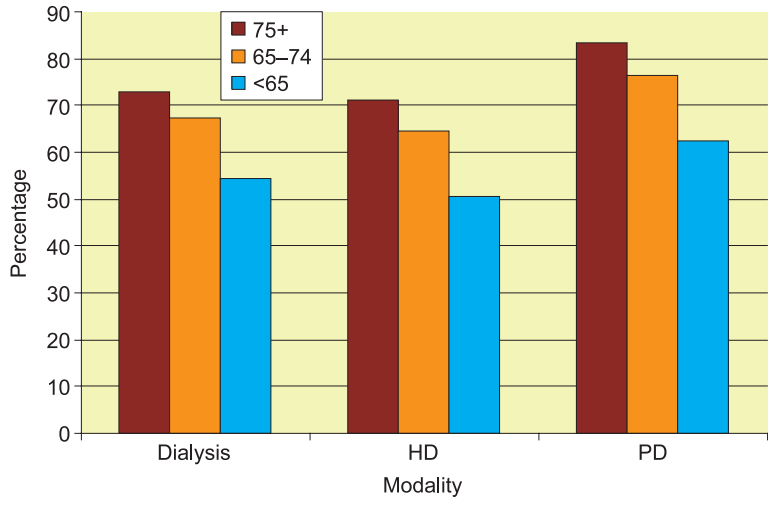

Figure 15.9: Percentage achievement of serum phosphate Standard in three age groups: dialysis

Table 15.12: Percentage achievement of serum phosphate <1.8mmol/L in the elderly

Age	Dialysis	HD	PD
<65	54%	51%	62%
65–74	67%	64%	76%
75–79	72%	70%	81%
80–84	74%	72%	87%
85+	79%	77%	96%

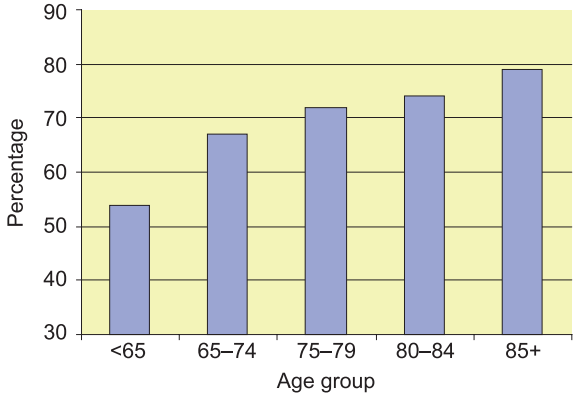

Figure 15.10: Percentage achievement of serum phosphate <1.8 mmol/L by age

The RA standards document recommends that the corrected serum calcium should be kept between 2.2 and 2.6 mmol/L. This was analysed by age and methodology used to measure serum albumin for the correction of the raw calcium values (BCG or BCP). Neither the albumin assay method, modality, nor age group had an effect on the proportion of patients achieving RA standards (Table 15.13).

Table 15.13: Percentage achieving the RA Standard for corrected serum calcium in three age bands

	Proportion of patients in range (2.2–2.6 mmol/L)					
	Dialysis		Haemodialysis		Peritoneal dialysis	
Age	BCG	BCP	BCG	BCP	BCG	BCP
<65	72%	73%	72%	71%	65%	77%
65–74	73%	76%	73%	75%	74%	80%
⩾75	75%	77%	76%	76%	73%	82%

Discussion

Several countries have reported an increase in the proportion of elderly patients starting RRT[1]. Of new patients starting treatment reported to the Registry, 22% are now aged ⩾75 years, this has increased from 15% in 1997. Prior to 1980, few ERF patients over the age of 60 were dialysed, partly through reluctance to refer to nephrology departments, partly because of reservations about likely prognosis and quality of life on dialysis and partly because of a lack of resources[2]. The reasons for the subsequent increase in numbers of elderly people commenced on RRT are multiple and include amongst others: an increased awareness of primary and secondary care physicians of the need to refer, technical advances leading to improved tolerance of dialysis, the development of PD programmes, an increase in treatment centres and the clinical demonstration of benefit to the elderly[3,4].

The small proportion of non-Whites among the elderly has been highlighted in the literature[4,5] and explained by several factors. It is known that the median age of South Asians and African-Caribbeans starting RRT is lower than that of Caucasians (Registry Report 2002) suggesting a younger population reaching established renal failure (ERF). This partly reflects the generally younger age profile of the ethnic minority population within the UK as a whole. Within the general population of England and Wales, only 16% of those aged 65 or more are from a non-White ethnic group (*www.statistics.gov.uk*). There may be an overall decreased life span in the minority ethnic groups due to a greater prevalence of diabetes and cardiovascular risk factors.

There is also postulated, decreased awareness of and possibly limited access to nephrology services. With regard to referral patterns however, UK Renal Registry data do not show any

evidence of lack of referral from the ethnic minorities and have shown that South Asians are more likely to be referred more than one year prior to initiating RRT to nephrology services than Whites. This does not eliminate the possibility that there may be unmet need in the elderly of ethnic minorities.

The main cause of established renal failure in the $\geqslant$75 years age group was uncertain (31%), probably because of late presentation with small kidneys to nephrology services. The commonest identified cause in the very elderly was renovascular disease (19%), which is not surprising given the frequency of vascular co-morbidity (peripheral, cardiac or cerebro-vascular). The low frequency of diabetes as a primary renal diagnosis in the older age cohort may reflect selection bias, or that relatively few diabetic patients survive to this age.

The high proportion of older patients on haemodialysis as a modality partly reflects the low rate of transplantation in the elderly. Many of these older patients are medically unfit for listing because of co-morbidities and may be also unable to manage PD successfully.

Although 33% of patients aged $\geqslant$75 years had no reported co-morbidity on starting RRT, 67% had one or more conditions. In the literature the proportion of incident patients aged $\geqslant$75 with at least one co-morbidity is $\geqslant$90% but the numbers studied were smaller[4]. Eighty percent of individuals over 65 years of age in the general population have one and 30% three or more chronic illnesses[6] and increasing co-morbidities have been shown to correlate with frequency of hospitalisation[4]. Cardiac disease was the commonest co-morbidity present in our cohort and this was reflected in the mortality of elderly patients on RRT; it was the commonest cause of death in the first 90 days and accounted for 22% of deaths in the year after 90 days.

The high proportion of elderly people achieving some standards such as serum phosphate, serum calcium and haemoglobin may reflect a more routine life style, more restrained appetites, or more respect for instruction/advice. The higher systolic BP is not surprising in view of the reduced compliance of the vascular tree in the elderly with susceptibility to dialysis-related hypotension. There is no evidence of under treatment of anaemia in the elderly.

Early mortality (within 90 days) among the elderly on dialysis increased significantly with age, from 16% for those 75–79 years old to 28% for those $\geqslant$85. The figures were 26% and 43% respectively for the year after 90 days. Treatment withdrawal became the commonest recorded cause of death in the year after 90 days in those aged $\geqslant$75 years. The Registry has no evidence of whether this was as a consequence of the quality of life, or the burden of current or chronic pathologies.

Some nephrologists offer a trial of dialysis to elderly patients and those with significant co-morbidity, with reassessment of the quality of life and functional status once established on RRT. This may account partly for the large number of deaths in the first 90 days and subsequent high treatment withdrawal rates. The decision to withdraw once started is often a difficult one for patient, family and staff. There is now evidence that with a comprehensive conservative approach, elderly patients can have a satisfactory quality of life without dialysis during their final months and may survive as long as many of those who are dialysed[7]. Once RRT has been initiated, the time required for treatment, the reduction in urine output and other physiological changes may actually reduce quality of life, so that there is a growing reluctance to enter into trials of RRT.

The very elderly patients starting RRT may represent the tip of an iceberg with more either not referred or not accepted for RRT. However, if those selected for dialysis carry the least co-morbidity, as their longevity on treatment is unimpressive the outcome in terms of survival and quality of life of the unreferred may be much worse. One should not assume that dialysis is the best option for all these patients.

The laboratory reporting of serum creatinine rather than calculated creatinine clearance plays a part in the failure to recognise established renal failure in the community. This is most misleading in women, patients of small build and the elderly. There are recommendations pending that clinical chemistry departments should be reporting an estimated creatinine clearance derived from serum creatinine. The

challenge for nephrologists will be to help thus identified uraemic elderly patients and their families come to appropriate choices about renal replacement therapy, a specific example of the goal of 'adding life to years rather than years to life' in the management of the elderly.

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