Chapter 11: Measures of Care in Adult Renal Transplant Recipients in the UK

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Summary

- The total number of patients active on the transplant waiting list (adult and paediatric) on 31/12/2005 was 5,736, an 8% increase from the previous year.
- On 31/12/2005 45.7% of prevalent adult RRT patients in the UK, had a functioning renal transplant which equated to 19,074 patients. During 2005, the death rate in prevalent transplant patients was 2.7 per 100 patient years. An additional 3.1% of all prevalent transplants failed with patients returning to dialysis.
- During 2005, deceased heart beating donor numbers decreased by 18% compared to 2004. In comparison, non-heart beating donors and living kidney donors increased by 35% and 17% respectively in 2005. The proportion of renal transplants performed from deceased heart beating donors fell from 68% in 2004 to 60% in 2005.
- There is wide variation in prevalence per million population (pmp) of transplanted patients resident in each local authority area across the UK.
- 11.4% of incident transplants in 2005 were to patients with diabetes.
- The median eGFR was 46.1 ml/min/1.73 m^2, with 18% of prevalent transplant recipients having an eGFR <30 ml/min/1.73 m^2.
- The median Hb in prevalent transplant recipients was 12.9 g/dl, with 10% of patients having an Hb <10 g/dl.
- The median systolic and diastolic BP was 136 and 79 mmHg respectively, with only 25% of patients within guidelines.
- Transplant function analysed by CKD stage 1–2 (eGFR <60), 3 (eGFR 30–59), 4 (eGFR 15–29) and 5 (eGFR <15), shows that these categories account for 24%, 59%, 15% and 2.5% of patients respectively.
- Haemoglobin values fall with decreasing eGFR such that of the 2.5% of transplant patients with eGFR <15 ml/min, 27% had an Hb <10 g/dl and 51% <11 g/dl.
- Control of iPTH was poor in transplant recipients in CKD stages 4 and 5, with 22% and 50% of patients respectively having a PTH >32 pmol/L (= 300 ng/L).
- Patients with failing transplants are less likely to achieve RA targets of key biochemical variables when compared to patients on dialysis.
- There is still wide variability in the completeness of data returns from individual units.

Introduction

This chapter reports on collaborative analyses carried out between the UK Renal Registry and UK Transplant (UKT), in conjunction with the support from the British Transplantation Society. This continues to be a fruitful and mutually beneficial relationship, as the details of the episode of transplantation held on the UKT database and the key clinical/biochemical variables other than just survival data held on the UKRR database complement each other. This combination of comprehensive data on transplant recipients is internationally unique and a great resource to assess renal transplant activity and its distribution across the UK, compare practices and key outcome variables between centres and to provide insight into the processes involved in the care of renal transplant patients.

Overview

In December 2005, there were 20 transplant centres in England (including 6 in London of which 1 is based in Great Ormond St. Paediatric Hospital), 1 in Northern Ireland, 2 in Scotland and 1 in Wales. The number of centres in England has been reduced by the amalgamation in London of Hammersmith with St. Mary's to form the West London Renal Transplant Centre, of the Royal Free with the Middlesex and of St. Helier's with St Georges.

Comprehensive information from 1995, concerning the number of patients on the transplant waiting list, the number of transplants performed, the number of heart beating, non heart beating and living donors and patient and graft survival are available on the UKT website (www.uktransplant.org/ukt/statistics).

As of 31st December 2005, 5,736 patients (including adult and paediatric) were active on the renal or renal + pancreas transplant waiting list, an increase of 8% when compared with 2004. Live donor and non-heart-beating donor transplants continue to increase and in 2005 formed 29% and 11% of all kidney transplants performed respectively (Table 11.1), although there has been a further large fall in heart-beating donors.

There was no statistically significant difference in one year and five year risk adjusted patient and graft survival rates amongst UK renal transplant centres (Table 11.2). These graft survival rates include grafts with primary non-function (which is excluded in some countries).

Table 11.1: Kidney and kidney plus other organ transplants in the UK, 1 Jan 2004–31 Dec 2005

Organ	2004	2005	% change
Heart-beating donor kidney[1]	1,211	998	−18
Non-heart-beating kidney	147	198	35
Living donor kidney	463	543	17
Kidney and liver	15	11	−27
Kidney and heart	0	2	–
Kidney and pancreas[2]	69	102	48
Total kidney transplants	**1,905**	**1,854**	**−3**

[1]Includes en-bloc kidney transplants (3 in 2004, 5 in 2005) and double kidney transplants (5 in 2004, 6 in 2005).
[2]Includes one non heart beating kidney and pancreas transplant.

Data from the UK Renal Registry show that 3.1% of patients with a functioning transplant on 1/1/2005 returned to dialysis after their transplants failed in 2005. This has remained unchanged since 2000.

Using data from the UKRR, the death rate in the prevalent transplant cohort was 2.7 (95% CI 2.5–3.0) censoring at return to dialysis and 2.9 per 100 patient years including those who restarted dialysis. This remains unchanged from previous years.

Table 11.2: Risk-adjusted first adult kidney transplant only, graft and patient survival percentage rates for UK centres*

	Deceased donor 1 yr survival		Deceased donor 5 yr survival		Living kidney donor 1 yr survival		Living kidney donor 5 yr survival	
Centre	**Graft**	**Patient**	**Graft**	**Patient**	**Graft**	**Patient**	**Graft**	**Patient**
Belfast	90	97	76	84	96	100	100	100
Birmingham	90	95	83	87	93	99	86	93
Bristol	95	95	86	91	95	100	97	100
Cambridge	90	95	77	86	95	99	89	100
Cardiff	90	96	83	88	95	98	85	93
Coventry	93	95	85	86	97	100	87	81
Edinburgh	92	97	81	86	98	98	82	93
Glasgow	89	95	81	87	97	98	85	100
Guy's	91	96	80	86	96	100	95	95
Hammersmith	94	91	83	86	85	100	88	100
Leeds	90	95	76	82	96	97	94	95
Leicester	87	93	79	85	97	98	82	94
Liverpool	90	97	76	89	93	96	84	95
Manchester	91	96	77	83	97	100	78	94
Middlesex	87	95	81	87	89	100	100	100
Newcastle	90	95	80	79	93	97	90	90
Nottingham	88	93	77	83	95	100	85	97
Oxford	94	94	85	85	94	99	91	97
Plymouth	87	90	73	86	71	89	83	100
Portsmouth	91	96	79	82	92	94	91	95
Royal Free	91	93	77	90	93	100	81	100
Royal London	92	95	81	82	95	100	84	97
Sheffield	90	98	80	87	91	100	84	91
St George's	93	97	86	86	94	97	87	92
St Mary's	96	99	84	86	95	99	95	100
All centres	**91**	**95**	**80**	**85**	**95**	**98**	**88**	**95**

Cohorts for survival rate estimation:
1 year survival: 1 Jan 2000–31 Dec 2004.
5 year survival: 1 Jan 1996–31 Dec 2000.
First grafts only – re-grafts excluded for patient survival estimation.
*Information courtesy of UKT. Number of patients and 95%CI for each data point can be obtained from the UKT website.

Post transplant follow up

There are 65 renal units which send data electronically to the UK Renal Registry with 53 also providing additional demographic, laboratory and blood pressure data for renal transplant patients during 2005. The 5 remaining UK renal units (Canterbury, Manchester RI, Stoke, London St Marys & London St Georges) not yet linked electronically have supplied summary statistics. Three centres (Chelmsford, Clwyd & Derby) have been excluded from data analyses below due to small numbers (<10 pts in each unit). Due to differences in the timing of repatriation of patients after transplantation from the transplanting centre to the host/non-transplanting renal unit, caution needs to be exercised when comparing results between centres. The number of prevalent patients on renal replacement therapy (RRT) in each renal unit and the proportion of transplant patients are shown in Table 11.3.

On 31/12/2005 45.7% of UK RRT patients had a functioning renal transplant. This ratio seems to have stabilised over the last 3 years. During the period 1997–2002 it had decreased from 51.0% to 46.0%.

Table 11.3: Distribution of prevalent patients on RRT and modalities 31/12/2005

Centre	Total	% HD	% PD	% Tx
Birmingham Heartlands	541	62	8	30
Birmingham QEH	1,518	47	9	43
Basildon	169	66	18	15
Bradford	367	46	12	42
Brighton	618	48	15	37
Bristol	1,165	37	6	57
Cambridge	819	35	10	55
Carlisle	185	42	11	46
Carshalton	1,002	48	17	35
Chelmsford	134	66	28	7
Coventry	638	43	10	46
Derby	277	73	26	2
Dorset	381	33	19	48
Dudley	258	46	21	33
Exeter	583	42	16	42
Gloucester	282	51	13	36
Hull	588	51	12	38
Ipswich	289	38	24	38
Kent & Canterbury	569	28	34	32
London Barts	1,337	37	16	46
London St Georges	544	34	9	56
London Guys	1,225	33	7	60
London H&CX	1,137	50	13	37
London Kings	636	46	12	41
London Royal Free	1,346	41	11	48
London St Marys	1,149	53	0	47
Leeds	1,341	35	10	55
Leicester	1,430	38	16	46
Liverpool	1,361	34	7	60
Manchester Hope	631	38	22	40
Manchester Royal Inf	1,420	23	12	65
Middlesborough	573	41	4	55
Newcastle	867	27	5	68
Norwich	409	57	12	31
Nottingham	894	36	16	48
Oxford	1,196	33	10	58
Plymouth	369	33	10	57
Portsmouth	1,085	32	10	59
Preston	772	43	15	42
Reading	409	45	26	29
Sheffield	1,166	47	14	39
Shrewsbury	236	53	22	26
Stevenage	567	56	9	35
Stoke	560	42	18	41
Southend	181	66	12	23
Sunderland	278	55	5	40
Truro	269	52	15	33
Wirral	192	84	16	–
Wolverhampton	440	66	13	21
York	182	51	14	35
England	**34,585**	**42**	**12**	**46**

Table 11.3: (continued)

Centre	Total	% HD	% PD	% Tx
Antrim	189	56	11	33
Belfast	749	42	9	49
Newry	155	58	10	32
Tyrone	169	62	4	35
Ulster	44	93	2	5
N. Ireland	**1,306**	**50**	**9**	**41**
Bangor	101	72	27	1
Cardiff	1,272	33	11	56
Clwyd	83	77	14	8
Swansea	473	56	17	27
Wrexham	146	70	30	–
Wales	**2,075**	**44**	**14**	**41**
Aberdeen	417	43	12	46
Airdrie	171	85	15	–
Dumfries & Galloway	69	71	19	10
Dundee	359	41	14	45
Dunfermline	150	65	17	18
Edinburgh	670	35	9	56
Glasgow Royal	350	92	7	1
Glasgow Western	1,243	21	6	73
Inverness	200	43	21	37
Kilmarnock	181	57	28	14
Scotland	**3,810**	**43**	**11**	**46**
England	**34,585**	**42**	**12**	**46**
N.Ireland	**1,306**	**50**	**9**	**41**
Wales	**2,075**	**44**	**14**	**41**
Scotland	**3,810**	**43**	**11**	**46**
UK	**41,776**	**42**	**12**	**46**

Demographic variables

Age and gender

There has been no significant change in the gender ratio of incident and prevalent transplant patients between 1998 and 2005 (Table 11.4; Fig. 11.1). This ratio reflects that found in patients starting RRT and indicates there is no gender bias in patient selection for transplantation. The median age of patients has been slowly rising.

Centre and Local Authority prevalence of renal transplant patients

In the UK there are approximately 19,000 RRT patients with a functioning renal transplant and the numbers under follow up in each UK renal unit are shown in Table 11.5. The prevalence (pmp) of patients with renal transplants living in each local authority (LA) is shown in Table 11.6 and was derived from the patient postcode which was validated against the full address using software from QAS systems. LA boundaries and population numbers were obtained from the UK 2001 census and the methodology is described in Appendix D on the web (www.renalreg.org). As 5 renal units in England are not yet submitting individual patient data electronically, any partially covered LA areas have been removed (this includes many areas in London due to high rates of cross boundary flow).

Although differences in local arrangements for transplant follow up impact on the proportion of patients followed up in transplant centres as opposed to referring renal units, this

Table 11.4: Median age and gender ratio of incident and prevalent transplant patients covered by the Registry

	Incident transplants			Prevalent transplants		
Year	Number	Median age	M:F ratio	Number	Median age	M:F ratio
1998	632	42.2	1.6	6,152	48.6	1.6
1999	654	42.6	1.8	6,693	48.7	1.6
2000	802	44.9	1.6	7,993	48.7	1.6
2001	976	44.7	1.6	10,065	48.7	1.6
2002	1,040	46.9	1.5	11,646	49.4	1.6
2003	1,173	45.3	1.5	12,689	49.5	1.6
2004	1,367	45.4	1.7	15,014	49.6	1.6
2005	1,479	45.4	1.5	16,878	49.7	1.6

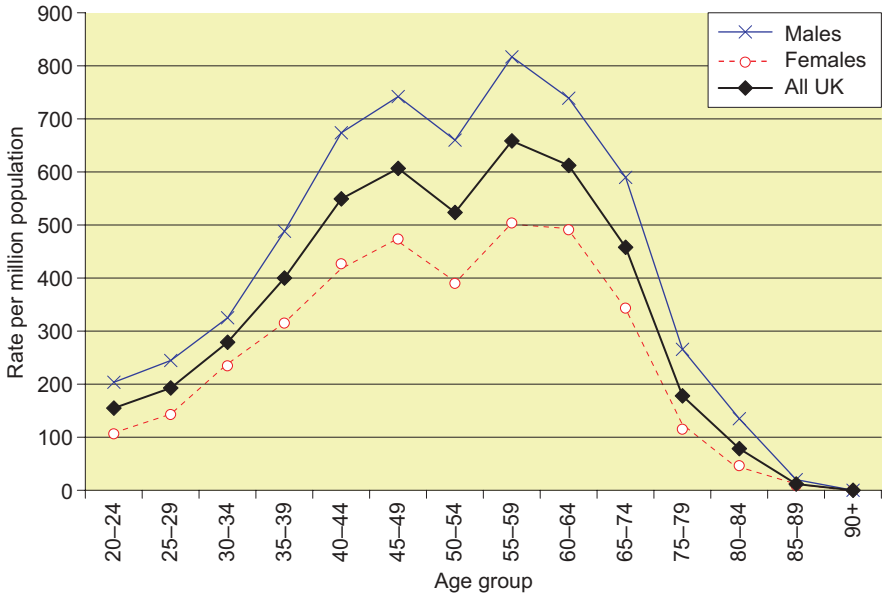

Figure 11.1: Transplant prevalence rate (pmp) by age and gender on 31.12.05

will not explain the variation in prevalence (pmp) of transplanted patients resident in different local authority areas as this has been allocated by patient postcode. These data need to be taken into consideration when planning the allocation of resources for transplant follow up, in order to ensure equity of access to medical care for these patients. Guidelines specifying minimum manpower requirements for the management of renal transplant patients are not currently available either from the British Transplantation Society or the UK Renal Association.

Co-morbidity and transplantation

The number of patients with established renal failure who are accepted onto the renal transplant waiting list is limited by co-morbidity. Comparison of the prevalence of co-morbidity (at the onset of renal replacement therapy) in dialysis patients with patients who have subsequently been transplanted (data from centres who have provided co-morbidity information on >80% of patients starting renal replacement therapy between 2000–2005) is shown in Table 11.7. Unsurprisingly there is less co-morbidity at the time of onset of renal replacement therapy in patients who are subsequently transplanted than in those who remain on dialysis, but the incidence of 'smokers' (as recorded in renal unit clinical databases) is the same in both groups. For next years report it is hoped to provide analysis of prevalence of co-morbidity in waitlisted and not waitlisted dialysis patients (in conjunction with waiting list data supplied by UKT) in comparison to patients who have been successfully transplanted.

Table 11.5: Number of prevalent transplant patients by renal unit on 31/12/05*

Dialysis centres	Number of patients	Transplant centres	Number of patients
Abrdn	190	Birm QEH	659
Airdrie	n/a	Belfast	366
Antrim	62	Bristol	660
B Heart	164	Camb	454
Bangor	n/a	Cardff	718
Basldn	26	Carsh	354
Bradfd	155	Covnt	296
Brightn	231	Edinb	372
Carlis	86	GlasWI	902
Chelms	9	Lond Barts	621
Clwyd	7	Lond George	307
D&Gall	7	Lond Guys	734
Derby	5	Lond Rfree	647
Dorset	182	Lond Marys	536
Dudley	85	Leeds	741
Dundee	161	Leic	660
Dunfn	27	Livrpl	814
Exeter	246	Man RI	920
Glas RI	4	Newc	588
Glouc	101	Nottm	428
Hull	222	Oxford	688
Inverns	73	Plymth	209
Ipswi	111	Ports	639
Kent	184	Sheff	459
Klmarnk	26		
Lond H&CX	416		
Lond Kings	263		
Man Wst	253		
Middlbr	313		
Newry	50		
Norwch	128		
Prestn	327		
Redng	119		
Shrew	61		
Stevng	196		
Stoke	228		
Sthend	41		
Sund	110		
Swanse	127		
Truro	88		
Tyrone	59	**England**	**15,920**
Ulster	2	**N Ireland**	**539**
Wirral	n/a	**Scotland**	**1,762**
Wolve	93	**Wales**	**853**
Wrexm	n/a	**UK**	**19,074**
York	63		

*Includes 5 units which are not electronically linked but provide summary statistics.

Table 11.6: The prevalence (pmp) of patients with renal transplant recipients by UK Local Authorities on 31/12/05

UK Area	Region	Local Authority	Population covered 2005	Rate pmp 2003	Rate pmp 2004	Rate pmp 2005
North East	County Durham and Tees Valley	Darlington	97,838	296	307	327
		Durham	493,469	338	355	373
		Hartlepool	88,610	372	418	406
		Middlesbrough	134,855	400	408	408
		Redcar & Cleveland	139,132	403	446	446
		Stockton-on-Tees	178,408	280	314	331
	Northumberland, Tyne & Wear	Gateshead	191,151	413	408	445
		Newcastle upon Tyne	259,536	328	335	362
		North Tyneside	191,658	417	407	444
		Northumberland	307,190	352	381	381
		South Tyneside	152,785	347	347	367
		Sunderland	280,807	370	385	370
North West	Cheshire & Merseyside	Halton	118,209	254	271	288
		Knowsley	150,459	312	299	292
		Liverpool	439,471	296	289	305
		Sefton	282,958	240	247	258
		St. Helens	176,843	204	221	238
		Warrington	191,080	262	277	272
		Wirral	312,293	295	298	301
	Cumbria & Lancashire	Blackburn with Darwen	137,470	138	196	175
		Blackpool	142,283	218	239	225
		Cumbria	487,607	258	277	271
		Lancashire	1,134,975	249	269	255
	Greater Manchester	Bolton	261,037	164	180	226
		Bury	180,607	39	61	100
		Oldham	217,276	87	101	110
		Rochdale	205,357	63	73	112
		Salford	216,105	139	148	171
		Wigan	301,415	133	146	169
Yorkshire & Humber	N & E Yorkshire & N Lincolnshire	East Riding of Yorkshire	314,113	226	248	264
		Kingston upon Hull, City of	243,588	263	275	291
		North East Lincolnshire	157,981	234	260	241
		North Lincolnshire	152,848	229	236	249
		North Yorkshire	569,660	246	277	286
		York	181,096	248	271	293
	South Yorkshire	Barnsley	218,063	335	349	339
		Doncaster	286,865	251	272	279
		Rotherham	248,175	262	286	266
		Sheffield	513,234	234	249	261
	West Yorkshire	Bradford	467,664	325	353	376
		Calderdale	192,405	353	395	421
		Kirklees	388,567	358	386	425
		Leeds	715,403	260	292	302
		Wakefield	315,172	261	279	305

Table 11.6: (continued)

UK Area	Region	Local Authority	Population covered 2005	Rate pmp 2003	Rate pmp 2004	Rate pmp 2005
East Midlands	Leicestershire, Northamptonshire & Rutland	Leicester	279,920	411	439	464
		Leicestershire	609,578	282	322	348
		Northamptonshire	629,676	268	192	292
		Rutland	34,563	434	463	492
	Trent	Derby	221,709	194	203	226
		Derbyshire	734,585	206	212	223
		Lincolnshire	646,644	249	288	298
		Nottingham	266,988	258	273	281
		Nottinghamshire	748,508	259	281	289
West Midlands	Birmingham & the Black Country	Birmingham	977,085		330	339
		Dudley	305,153		249	246
		Sandwell	282,904		315	339
		Solihull	199,515		226	251
		Walsall	253,498		276	288
		Wolverhampton	236,582		262	262
	Coventry, Warwickshire Hererfordshire, Worcestershire	Coventry	300,849	293	316	332
		Herefordshire, County of	174,871		263	274
		Warwickshire	505,858	322	358	356
		Worcestershire	542,105		234	260
	Shropshire & Staffordshire	Shropshire	283,173		205	237
		Telford and Wrekin	158,325		133	139
East of England	Bedfordshire & Hertfordshire	Bedfordshire	381,572	223	259	296
		Hertfordshire	1,033,978		143	229
		Luton	184,373	222	244	325
	Essex	Essex	1,310,837		224	258
		Southend-on-Sea	160,259	94	150	206
		Thurrock	143,128		196	252
	Norfolk, Suffolk & Cambridgeshire	Cambridgeshire	552,659	219	239	279
		Norfolk	796,728		222	235
		Peterborough	156,061	179	224	224
		Suffolk	668,555		220	229
London	North Central London	Barnet	314,561			315
		Camden	198,020			288
		Enfield	273,559			391
		Haringey	216,505			323
		Islington	175,797			336
	North East London	Barking & Dagenham	163,942		226	256
		Hackney	202,824		232	306
		Newham	243,889		221	250
		Redbridge	238,634		289	327
		Tower Hamlets	196,105		189	235
		Ealing	300,948	243	266	292
		Hammersmith & Fulham	165,244	224	242	248
		Hillingdon	243,006		189	263
		Hounslow	212,342		226	264

Table 11.6: (continued)

UK Area	Region	Local Authority	Population covered 2005	Rate pmp 2003	Rate pmp 2004	Rate pmp 2005
London	South East London	Bexley	218,307	362	380	403
		Bromley	295,532	281	298	328
		Greenwich	214,404	219	233	266
		Lambeth	266,169	195	222	237
		Lewisham	248,923	329	378	386
		Southwark	244,866	400	429	466
	South West London	Croydon	330,588	215	224	248
South East	Hampshire & I of Wight	Hampshire	1,240,102	278	296	294
		Isle of Wight	132,731	286	301	309
		Portsmouth	186,700	375	380	359
		Southampton	217,444	308	308	322
	Surrey & Sussex	Brighton and Hove	247,817		206	206
		East Sussex	492,326		244	250
		Surrey	1,059,017		240	252
		West Sussex	753,612		244	259
	Thames Valley	Bracknell Forest	109,616		283	255
		Buckinghamshire	479,026	340	328	342
		Milton Keynes	207,057	270	275	309
		Oxfordshire	605,489	348	363	380
		Reading	143,096	370	356	217
		Slough	119,064	319	336	353
		West Berkshire	144,485	360	360	325
		Wokingham	150,231	273	266	273
South West	Avon, Gloucestershire & Wiltshire	Bath & N.E. Somerset	169,040	207	266	284
		Bristol, City of	380,616	397	415	418
		Gloucestershire	564,559	287	319	338
		North Somerset	188,564	414	435	419
		South Gloucestershire	245,641	379	383	399
		Swindon	180,051	289	294	311
		Wiltshire	432,972	245	254	270
	Dorset & Somerset	Bournemouth	163,444		269	257
		Dorset	390,980		312	333
		Poole	138,288		275	333
		Somerset	498,095	293	303	329
	South West Peninsula	Cornwall & Scilly	501,267	277	297	333
		Devon	704,491	265	275	285
		Plymouth	240,722	366	366	420
		Torbay	129,706	285	301	332
Wales	Bro Taf	Cardiff	305,353	373	386	406
		Merthyr Tydfil	55,979	393	464	518
		Rhondda, Cynon, Taff	231,947	349	392	435
		Vale of Glamorgan	119,292	327	360	344
	Dyfed Powys	Carmarthenshire	172,842	324	324	353
		Ceredigion	74,941	294	374	347
		Pembrokeshire	114,131	280	289	333
		Powys	126,353		230	222

Table 11.6: (continued)

UK Area	Region	Local Authority	Population covered 2005	Rate pmp 2003	Rate pmp 2004	Rate pmp 2005
Wales	Gwent	Blaenau Gwent	70,064	442	400	385
		Caerphilly	169,519	354	354	366
		Monmouthshire	84,885	436	495	530
		Newport	137,012	365	380	350
		Torfaen	90,949	429	451	451
	Morgannwg	Bridgend	128,645	342	365	396
		Neath Port Talbot	134,468	312	335	357
		Swansea	223,300	367	412	416
	North Wales	Conwy	109,596	301	328	319
		Denbighshire	93,065	247	247	301
		Flintshire	148,594	262	283	303
		Gwynedd	116,843	274	274	300
		Isle of Anglesey	66,829	180	209	224
		Wrexham	128,476	325	311	311
Scotland		Aberdeen City	212,125	321	316	316
		Aberdeenshire	226,871	287	300	313
		Angus	108,400	452	517	526
		Argyll & Bute	91,306	274	252	252
		Scottish Borders	106,764	244	244	272
		Clackmannanshire	48,077	250	250	270
		West Dunbartonshire	93,378	278	257	257
		Dumfries & Galloway	147,765	277	298	311
		Dundee City	145,663	405	384	391
		East Ayrshire	120,235	225	250	258
		East Dunbartonshire	108,243	416	406	416
		East Lothian	90,088	344	344	322
		East Renfrewshire	89,311	358	381	392
		Edinburgh, City of	448,624	305	308	334
		Falkirk	145,191	317	310	324
		Fife	349,429	279	266	289
		Glasgow City	577,869	377	396	421
		Highland	208,914	268	282	316
		Inverclyde	84,203	285	321	368
		Midlothian	80,941	284	297	309
		Moray	86,940	322	334	414
		North Ayrshire	135,817	309	346	398
		North Lanarkshire	321,067	336	330	355
		Orkney Islands	19,245	468	520	572
		Perth & Kinross	134,949	319	311	326
		Renfrewshire	172,867	399	359	382
		Shetland Islands	21,988	273	318	273
		South Ayrshire	112,097	348	339	339
		South Lanarkshire	302,216	351	377	381
		Stirling	86,212	267	255	255
		West Lothian	158,714	378	347	372
		Eilean Siar	26,502	189	189	226

Table 11.6: (continued)

UK Area	Region	Local Authority	Population covered 2005	Rate pmp 2003	Rate pmp 2004	Rate pmp 2005
Northern Ireland		Antrim	48,366			331
		Ards	73,244			328
		Armagh	54,262			350
		Ballymena	58,610			239
		Ballymoney	26,895			223
		Banbridge	41,389			314
		Belfast	277,391			292
		Carrickfergus	37,658			531
		Castlereagh	66,488			436
		Coleraine	56,314			213
		Cookstown	32,581			92
		Craigavon	80,671			310
		Derry	105,066			324
		Down	63,828			251
		Dungannon	47,735			230
		Fermanagh	57,527			174
		Larne	30,833			616
		Limavady	32,422			308
		Lisburn	108,694			386
		Magherafelt	39,778			402
		Moyle	15,932			314
		Newry and Mourne	87,058			402
		Newtownabbey	79,996			288
		North Down	76,323			341
		Omagh	47,953			250
		Strabane	38,246			261
England			**42,396,371**	**261**	**273**	**294**
Scotland			**5,062,011**	**325**	**329**	**348**
Wales			**2,903,083**	**324**	**351**	**365**
Northern Ireland			**1,685,260**			**315**
Total			**52,046,725**	**274**	**283**	**304**

Table 11.7: Comparison of co-morbidity in patients starting RRT during 2000–2005 who remained on dialysis, with those who were subsequently transplanted

	Not transplanted		Transplanted	
Co-morbidity	**Number**	**%**	**Number**	**%**
Patients with co-morbidity data	5,873		865	
Without any co-morbidity	2,680	45.6	644	74.5
Ischaemic heart disease	1,423	24.3	40	4.6
Peripheral vascular disease	782	13.3	25	2.9
Cerebro-vascular disease	615	10.5	26	3.0
Diabetes (not cause of ERF)	447	7.7	21	2.4
COPD	440	7.5	19	2.2
Liver disease	151	2.6	5	0.6
Malignancy	746	12.7	13	1.0
Smoking	861	15.1	126	15.6

Table 11.8: Ethnicity of patients who received a transplant in the years 2000 to 2005

Year	% White	% South Asian	% African Caribbean	% other	% unknown
2000	65.5	3.4	2.9	1.0	27.3
2001	69.2	4.4	1.7	0.8	23.8
2002	72.5	6.5	4.4	1.4	15.1
2003	70.7	4.0	3.1	1.4	20.8
2004	68.8	6.5	4.2	1.8	18.7
2005	69.0	7.0	4.9	1.2	17.8

Ethnicity and transplantation

It is difficult to tell whether there has been any significant change in the ethnic ratio of patients receiving a renal transplant between 2000 and 2005. An apparent increase in the proportion of recipients who are of South Asian or African Caribbean ethnicity is likely to be due to improvements in the completion of data returns. This opinion is supported by the fact that there has been no reduction in the proportion of transplanted patients who are White whilst there has been a reduction in the proportion of patients reported as being of unknown ethnic origin (Table 11.8).

Other demographic variables

There has been no change in the relative proportions of the primary renal diagnosis of patients transplanted in 2005 compared with previous years (Table 11.9).

Post-transplant outcome

The number of UK renal transplant patients included in this year's Renal Registry Report has increased with more renal units contributing data to the Registry. However, there is room for improvement in the completeness of information about clinical variables from each centre (Table 11.10), with data returns from some centres being better than others. Therefore caution is needed when interpreting the following information from centres with a substantial proportion of missing data.

Methods

Prevalent patient data

Data from both transplanting and non-transplanting renal units concerning biochemical and clinical variables for patients with a functioning transplant were included in the analyses. The cohort is comprised of patients transplanted before 30 September 2005. Patients were considered as having a functioning transplant if 'transplant' was listed as the mode of renal replacement therapy in one or more of the quarters in 2005 without any other modality of treatment or death being entered for any of the subsequent quarters in 2005. Patients were assigned to the renal unit that sent the data to the Renal Registry but some patients will have received care in more than one unit. If data for the same transplant patient were received from both the transplant centre and non-transplant centre, care was allocated to the non-transplant centre.

Table 11.9: Primary diagnosis of renal transplant recipients

	New transplants in 2005		Established transplants 01/01/05	
Diagnosis	%	No	%	No
Aetiology unc./Glom. NP*	19.5	289	21.9	3,288
Diabetes	11.4	168	7.3	1,090
Glomerulonephritis	18.9	280	20.1	3,015
Polycystic kidney disease	11.5	170	12.1	1,812
Pyelonephritis	11.8	174	16.3	2,443
Reno-vascular disease	6.4	94	6.5	973
Other	12.4	183	15.0	2,254
Not available	8.2	121	0.9	139

Table 11.10: Percentage completeness by centre for prevalent patients on 31/12/05

	Ethnicity		eGFR		Hb		BP	
Centre	%	Number with data	%	Number with data	%	Number with data	%	Number with data
Antrim	100.0	60	90.0	54	83.3	50	0.0	0
B Heart	100.0	163	87.7	143	86.5	141	3.1	5
B QEH	99.8	634	89.8	570	89.1	566	0.2	1
Basldn	100.0	26	92.3	24	92.3	24	3.9	1
Belfast	100.0	359	95.8	344	93.5	336	33.4	120
Bradfd	66.7	96	65.3	94	91.7	132	97.2	140
Brightn	33.8	76	27.6	62	83.6	188	0.4	1
Bristol	98.4	633	96.1	618	97.4	626	85.2	548
Camb	75.3	323	72.5	311	93.9	403	0.5	2
Cardff	41.4	289	39.7	277	96.3	672	94.7	661
Carlis	100.0	86	95.4	82	91.9	79	0.0	0
Carsh	89.9	312	81.0	281	88.2	306	0.3	1
Covnt	89.2	255	75.2	215	84.3	241	77.6	222
Dorset	98.9	178	95.0	171	93.9	169	28.9	52
Dudley	100.0	84	92.9	78	92.9	78	85.7	72
Exeter	96.7	231	90.8	217	93.7	224	28.9	69
Glouc	100.0	100	99.0	99	96.0	96	2.0	2
Hull	91.4	203	81.5	181	89.6	199	1.4	3
Ipswi	99.1	107	94.4	102	95.4	103	97.2	105
L Guys	87.7	640	84.9	620	97.0	708	1.1	8
L H&CX	100.0	408	96.8	395	96.3	393	0.0	0
L Kings	93.7	238	88.2	224	93.3	237	0.0	0
L Rfree	66.8	423	54.0	342	68.7	435	0.0	0
Leeds	69.3	501	66.9	484	94.1	680	70.7	511
Leic	88.5	568	80.7	518	81.2	521	85.1	546
Livrpl	94.0	745	86.5	686	90.7	719	82.0	650
ManWst	93.3	223	83.3	199	84.1	201	0.0	0
Middlbr	92.8	284	90.9	278	95.4	292	58.5	179
Newc	99.3	558	97.0	545	97.7	549	1.3	7
Newry	100.0	50	74.0	37	40.0	20	4.0	2
Norwch	69.1	87	65.1	82	95.2	120	0.0	0
Nottm	95.0	397	89.5	374	94.7	396	93.3	390
Oxford	30.3	200	29.7	196	97.0	640	15.6	103
Plymth	97.5	195	94.5	189	95.5	191	0.0	0
Ports	99.2	620	90.1	563	87.5	547	0.0	0
Prestn	91.6	272	84.9	252	89.6	266	0.0	0
Redng	100.0	119	98.3	117	98.3	117	99.2	118
Sheff	99.3	445	98.0	439	98.7	442	98.4	441
Shrew	100.0	60	100.0	60	100.0	60	5.0	3
Stevng	100.0	190	52.1	99	66.3	126	1.1	2
Sthend	82.5	33	77.5	31	92.5	37	0.0	0
Sund	96.3	105	95.4	104	99.1	108	0.0	0
Swanse	100.0	124	99.2	123	98.4	122	18.6	23
Truro	80.2	69	76.7	66	96.5	83	95.4	82
Tyrone	100.0	58	58.6	34	39.6	23	1.7	1
Wolve	100.0	92	97.8	90	97.8	90	84.8	78
York	80.3	49	78.7	48	90.2	55	98.4	60
Eng	**86.9**	**11,609**	**76.8**	**10,255**	**86.8**	**11,597**	**33.0**	**4,404**
Wls	**49.9**	**414**	**48.2**	**400**	**96.5**	**801**	**83.3**	**691**
NI	**100.0**	**539**	**89.0**	**471**	**81.4**	**431**	**23.4**	**124**
UK	**85.2**	**12,562**	**75.5**	**11,132**	**87.1**	**12,837**	**35.4**	**5,219**

*Centres with <20 patients are not shown. Scotland and London Barts are not included as they do not provide biochemical data.

For laboratory results, the last value in quarter 3 or quarter 4 of 2005 was used (last 6 months). For blood pressure recordings the latest value from 2005 was used.

eGFR

For the purpose of eGFR calculation, the 4-variable MDRD formula was used, although serum creatinine has not been standardised to that of the assay used at the MDRD laboratory, or taken into account the different creatinine assay methods in use in the UK.

By May 2006, over 60% of UK laboratories had aligned their creatinine assays with that of the creatinine concentration obtained using the Beckman analyzer running a compensated kinetic Jaffe assay as used in the MDRD study. In the UK there is now a further move towards standardising against an isotope dilution mass spectrometry (ID-MS) traceable creatinine result, which will then require use of an adjusted 4v MDRD equation. The UK Association of Clinical Biochemists have stated that most UK laboratories were using the kinetic Jaffe assay and the standard 4v MDRD equation is most appropriate (personal communication E Lamb).

Patients without ethnicity information were excluded from the eGFR analysis.

One year post transplant data

Whilst comparing data relating to transplant patients from different renal units it is important to recognise that in addition to individual centre clinical practice, the results may be affected by a number of factors such as differences in local transplant repatriation policies and the relative numbers of patients with recent as opposed to long established grafts. To minimise such bias, for the first time the UKRR has analysed the outcome in patients at one year after transplantation.

Patients who received a renal transplant between 01 January 2000 and 31 December 2004 were assigned according to the renal unit in which they were transplanted. Transplant units were only included if they had submitted data throughout the 5 year period. Patients who had died or experienced graft failure within 12 months post transplantation were excluded from analysis.

For each patient, the last laboratory or BP value in the 4th quarter or the first value in the 5th quarter after renal transplantation was taken to be representative of the 'one year post transplant outcome'. For the purpose of eGFR calculation (4-variable MDRD formula), if there was a valid serum creatinine but no ethnicity data available, patients were classed as White.

Post transplant eGFR in prevalent transplant recipients

Median eGFR in each centre and percentage of patients with eGFR $\geqslant 60$ or <30 ml/min/1.73 m^2 are shown in Figures 11.2 to 11.4. Only

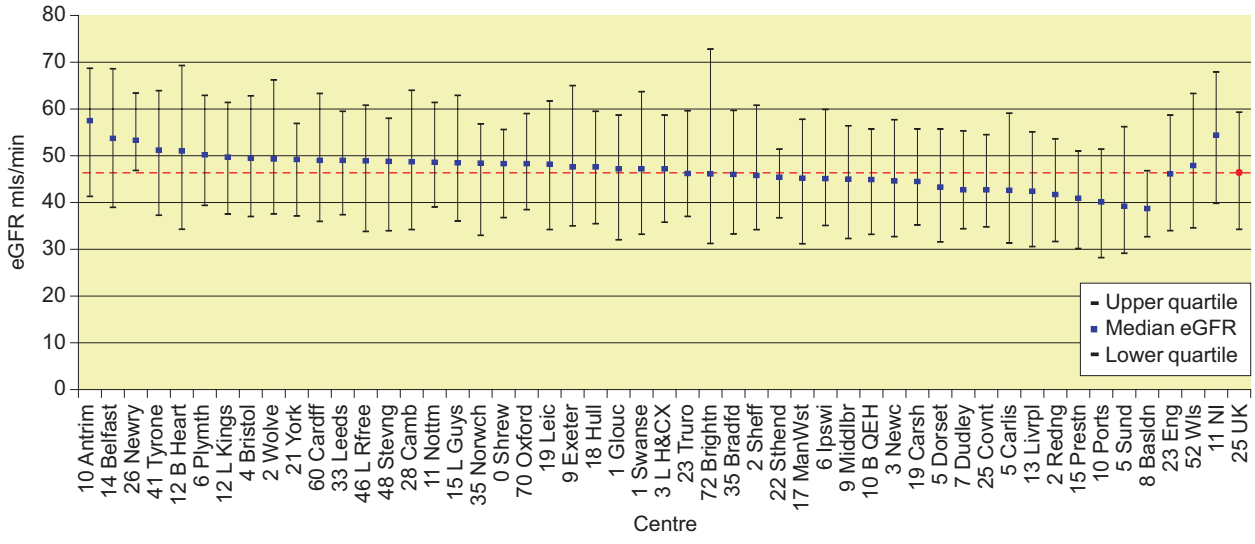

Figure 11.2: Median eGFR of prevalent patients by centre

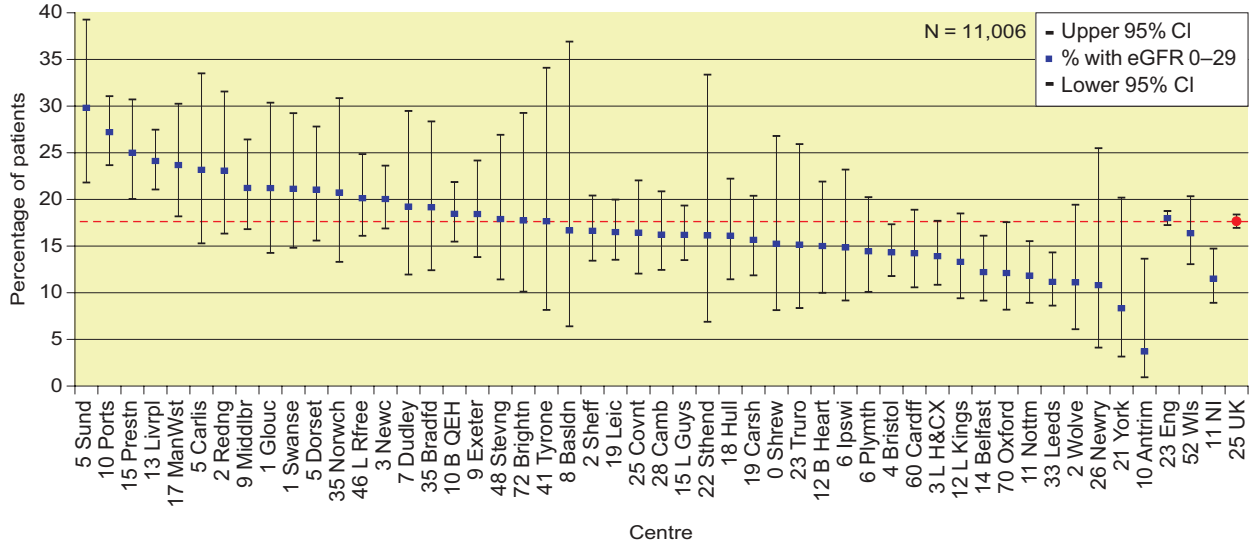

Figure 11.3: Percentage of prevalent transplant patients with eGFR <30 ml/min/1.73 m^2

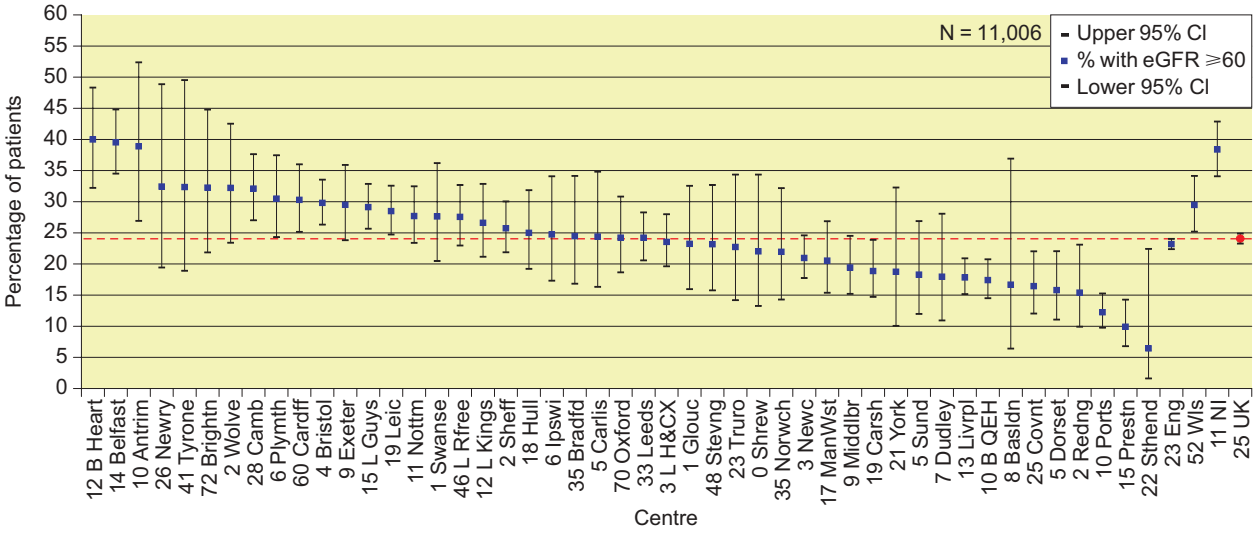

Figure 11.4: Percentage of prevalent transplant patients with eGFR ⩾60 ml/min/1.73 m^2

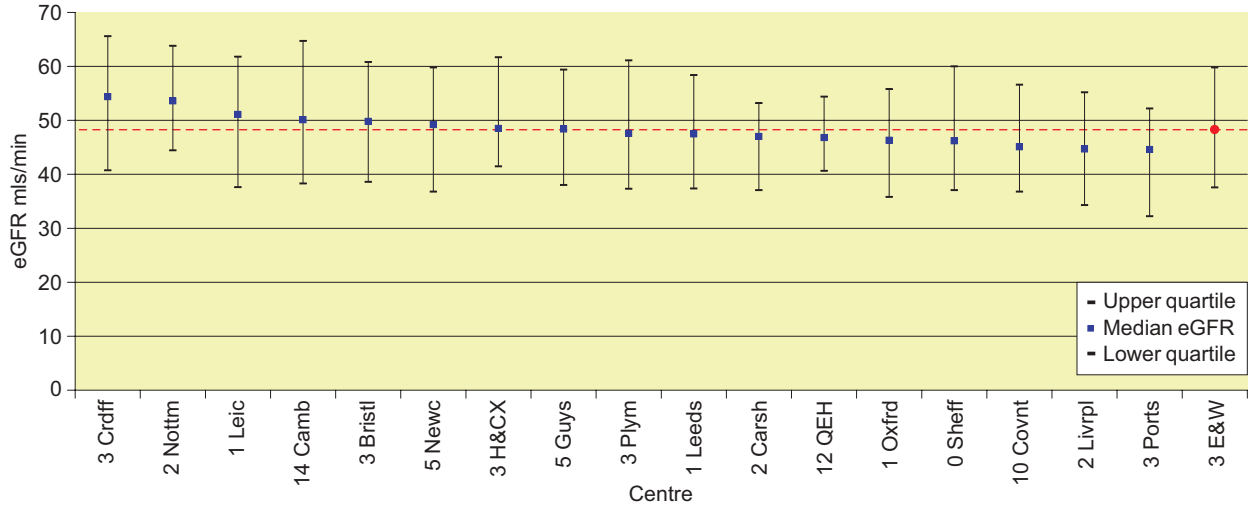

Figure 11.5: Median eGFR one year after date of transplant by transplant centre for cohort 2000–2004

centres with >20 patients are shown in these figures. The median eGFR was 46.1 ml/min/1.73 m^2, with 18% of prevalent transplant recipients having an eGFR <30 ml/min/1.73 m^2. Some centres may have a higher proportion of patients with eGFR <30 ml/min/1.73 m^2 because of local repatriation policies in which patients are only transferred back to the referring renal unit from the transplant centre when the need for dialysis is imminent. Patients with low eGFR, will require substantial resource allocation to prepare for dialysis or to be managed conservatively.

eGFR in patients one year after transplantation

Renal function one year after transplantation is believed to be predictive of future graft performance[1]. Figure 11.5 shows that median eGFR one-year post transplant for patients transplanted between 2000–2004 was 48.3 ml/min/1.73 m^2. All transplants (deceased and live kidney donors) from each unit were included in this analysis.

Haemoglobin in prevalent transplant patients

Transplant patients are to be under the RA CKD guidelines that all patients should have a haemoglobin above 10g/dl.

A number of factors including immunosuppressive medication, graft function, EPO use, IV/oral iron use as well as centre practices/protocols for management of anaemia affect haemoglobin levels in transplant patients. Figure 11.6 gives median Hb values from UK centres whilst Figure 11.7 shows the percentage of transplant patients with Hb <10 g/dl. Only centres with >20 patients and also >50% data returns are shown in these figures.

The median Hb was 12.9 g/dl, with 10% of patients having a Hb <10 g/dl. It is interesting to note that the five centres with the highest percentage of prevalent transplant patients with eGFR <30 ml/min/1.73 m^2 (Figure 11.3) are not the same as the five centres with the highest percentage of patients with Hb <10 g/dl.

Haemoglobin in patients one year after transplantation

Figure 11.8 shows that the median Hb at 1 year post transplant was 13.0 g/dl. Some centres with above average eGFR also have above average haemoglobin results at one year after transplantation.

Blood pressure in prevalent transplant patients

In the absence of controlled trial data, opinion based recommendation from the RA states that BP targets for transplant patients should be similar to the targets for patients with CKD ie systolic BP <130 and diastolic BP <80.

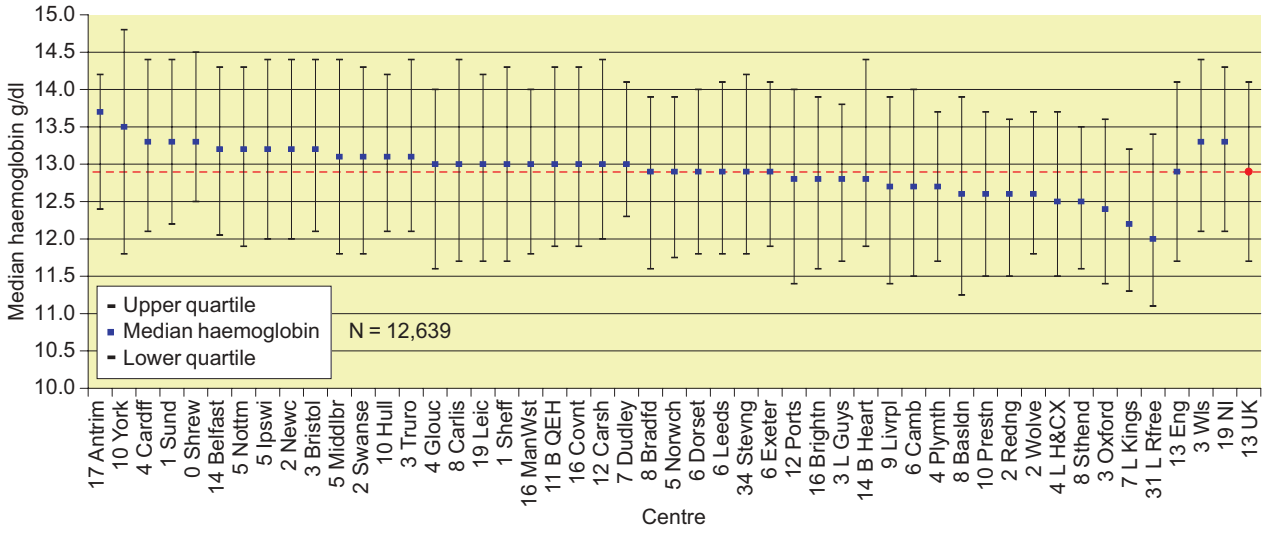

Figure 11.6: Median Hb of prevalent transplant patients by centre

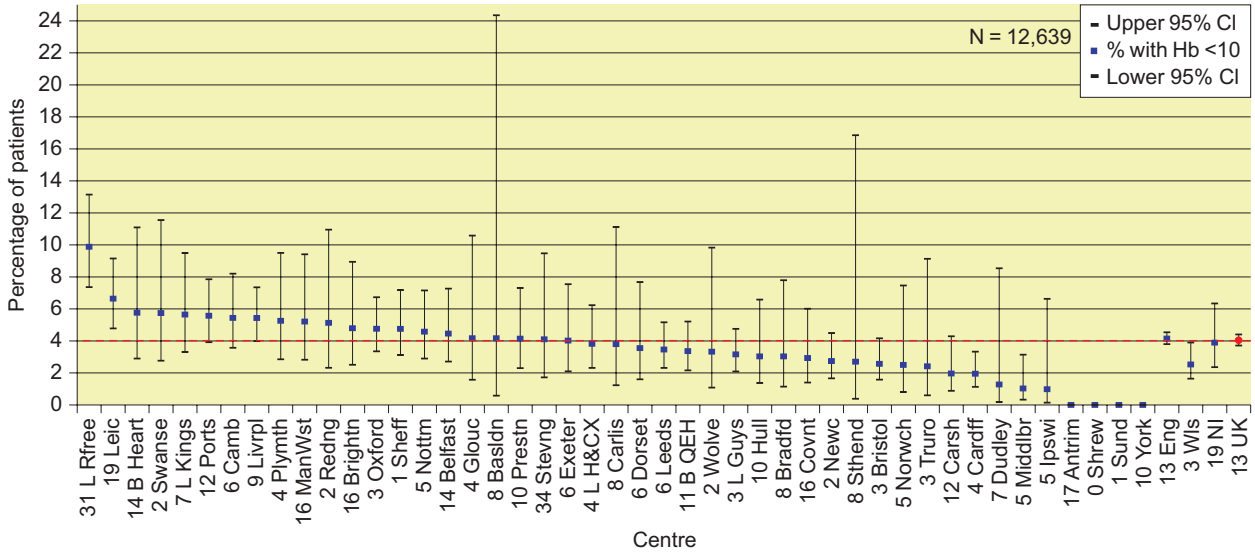

Figure 11.7: Percentage of prevalent patients with Hb <10 g/dl

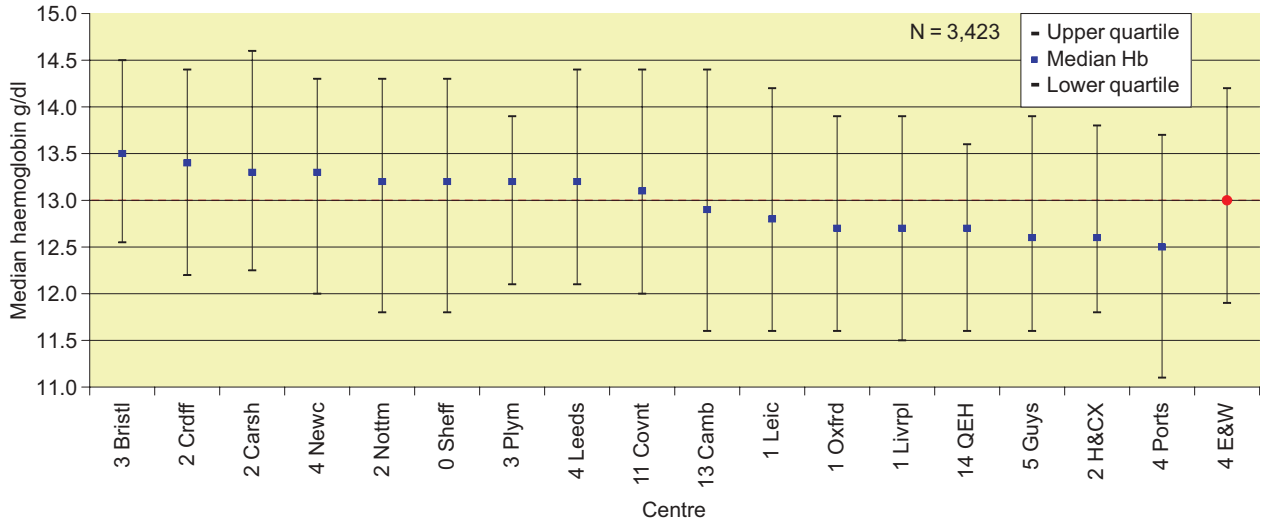

Figure 11.8: Median Hb one year post transplant for patients transplanted between 2000–2004, by centre

Although some centres provide BP data for the majority of their patients many centres provide little if any. Median systolic BP (Figure 11.9), median diastolic BP (Figure 11.10) and the percentage of patients who achieve RA standards (Figure 11.11) are shown. The median systolic and diastolic BP was 136 and 79 mm Hg respectively, with only 25% of patients within guidelines. Only centres with >20 patients and also >50% data returns are shown in these figures.

Blood pressure in patients one year after transplantation

The number of patients who had valid returns for systolic (Figure 11.12) and diastolic BP (Figure 11.13) one year post transplant are substantially less than the numbers available for eGFR and Hb. Since the completeness of data for this variable is very poor, comparison between units is open to criticism.

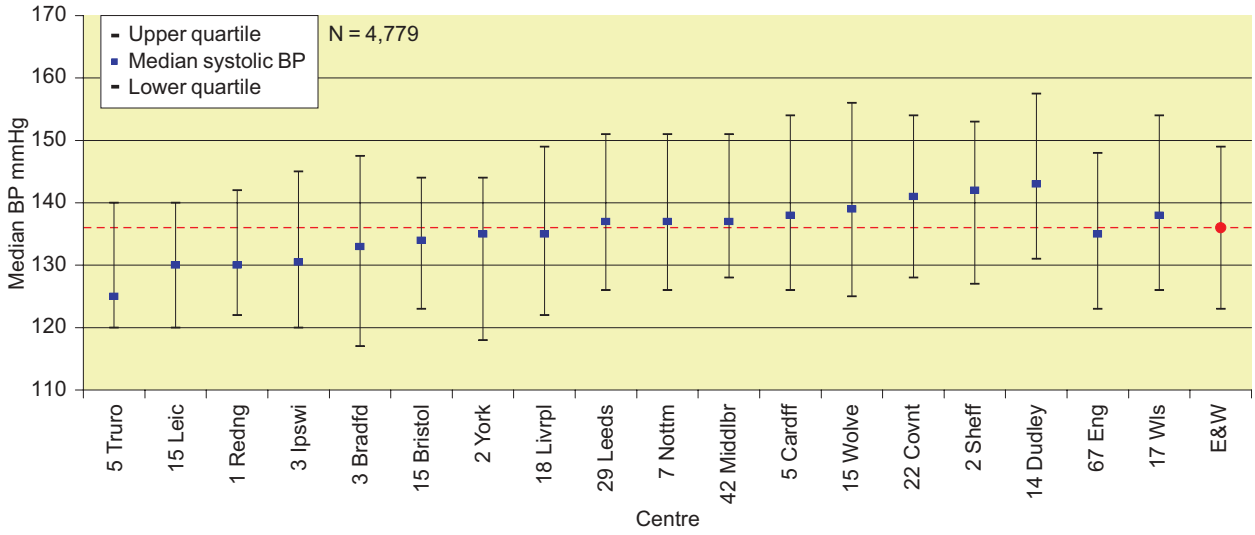

Figure 11.9: Median systolic BP in patients with renal transplants from different renal units

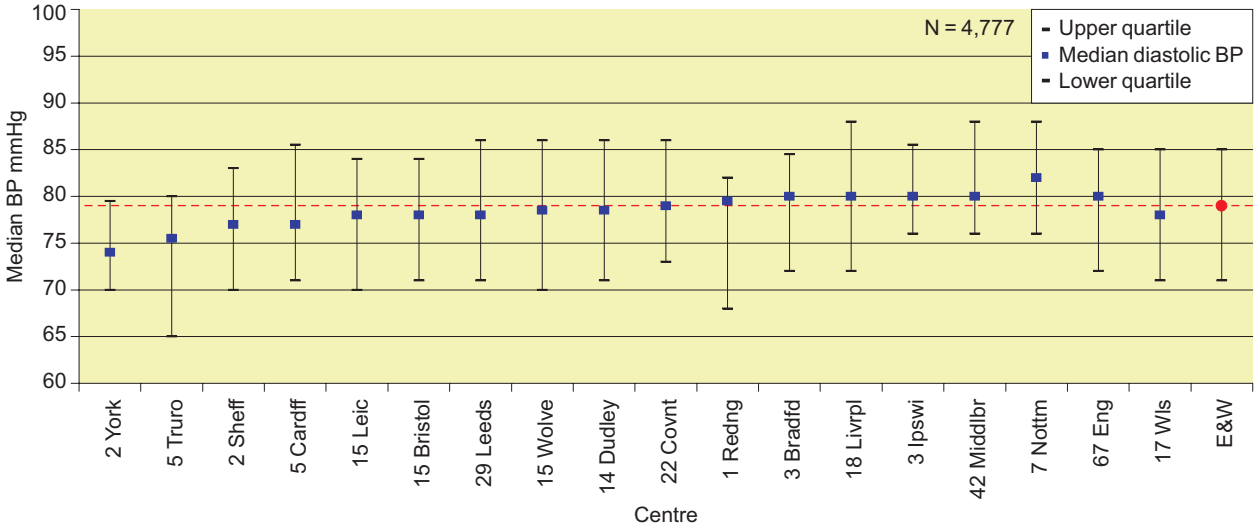

Figure 11.10: Median diastolic BP in patients with renal transplants from different renal units

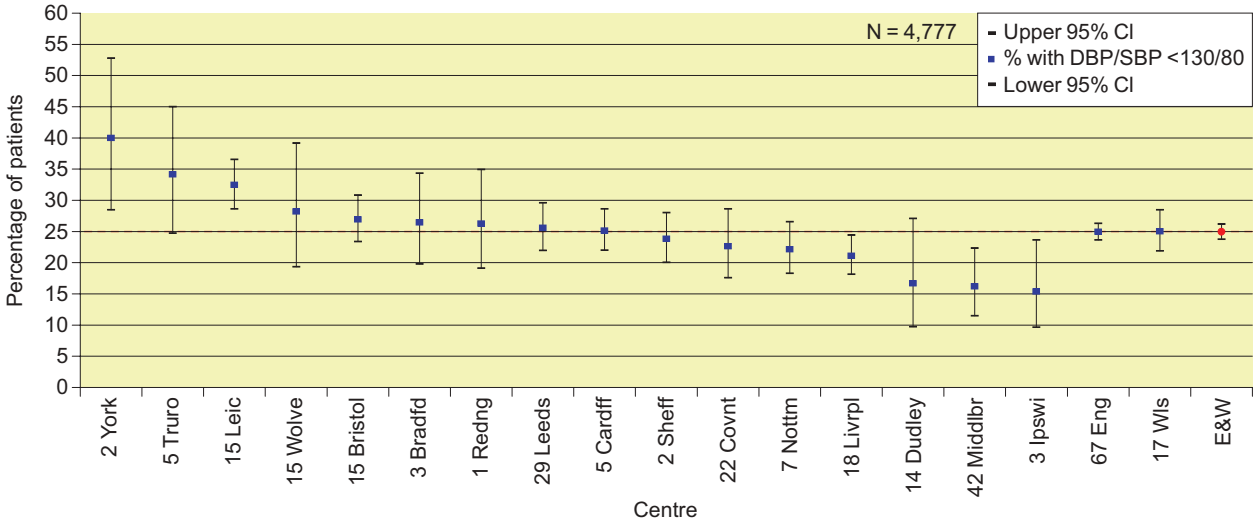

Figure 11.11: Percentage of patients with renal transplants in different renal units who achieve the RA standards for BP

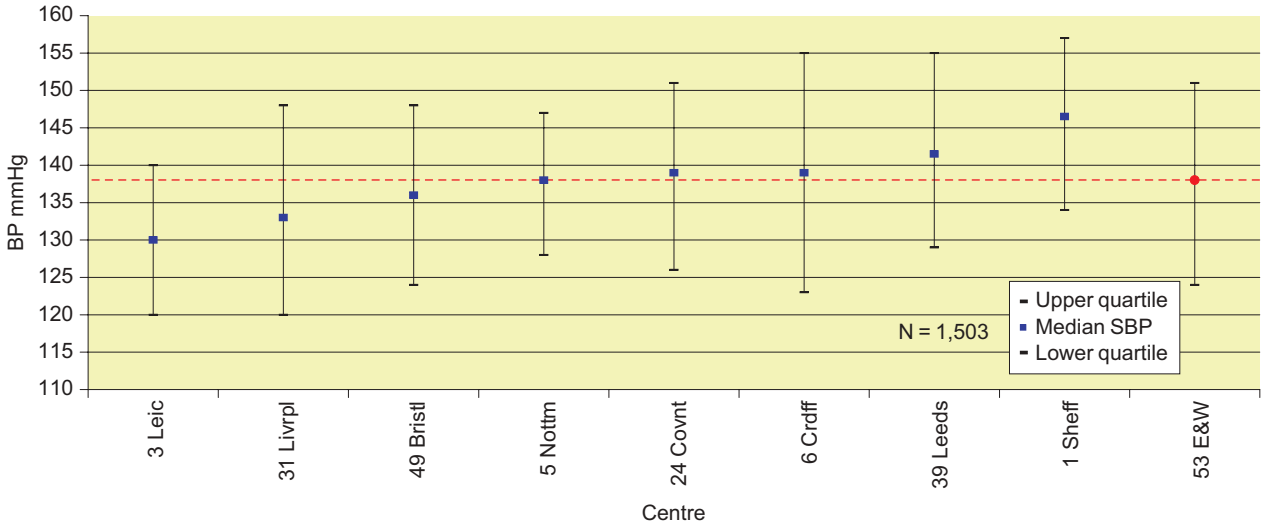

Figure 11.12: Median systolic BP one year post transplant by centre

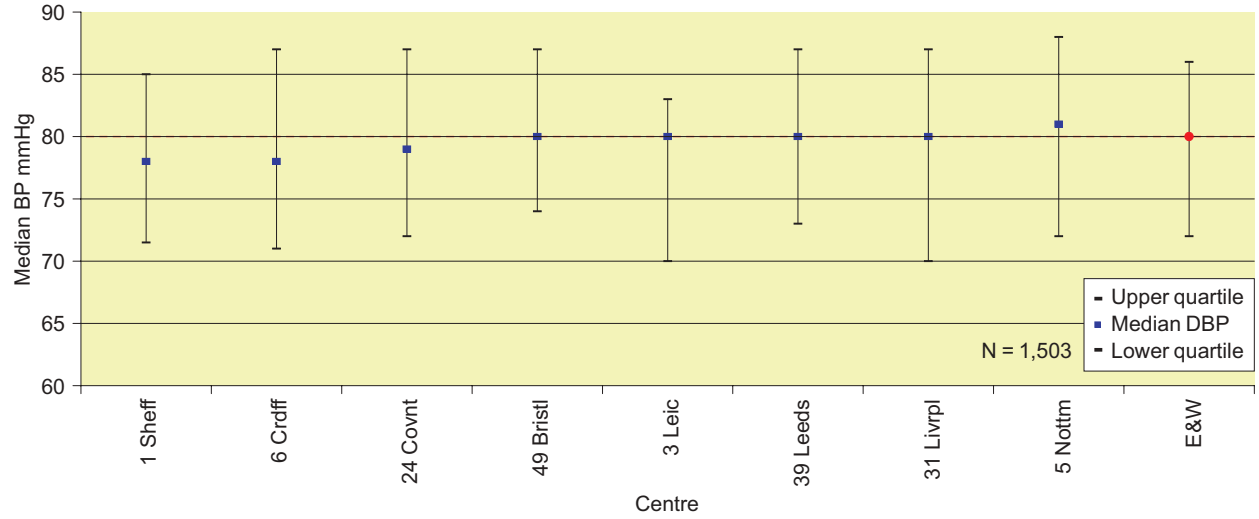

Figure 11.13: Median diastolic BP one year post transplant by centre

Analysis of prevalent transplant patients by CKD stage

About 3% of prevalent transplant patients return to dialysis each year. Patients with failing transplants are similar to other patients with CKD stage 5 in that they contribute substantially to the work load of the multi-disciplinary renal team in order to ensure a safe and seamless transition to dialysis or conservative care. While centre practices vary, in most UK renal units such patients are routinely followed up in transplant out-patient clinics which may not be designed to address the needs of patients with stage 5T transplant function. The results of an analysis to establish the number of patients in each CKD stage T group and to determine if the common biochemical targets for patients on dialysis are comparable to patients post-transplantation are shown in Table 11.11. Approximately 18% of transplant recipients have CKD stage 4T or 5T. While the numbers of patients in the stage 5T group are small, the data suggests that fewer patients in this category achieve the clinical and biochemical targets when compared with patients on dialysis. Whether these results are substantially different to patients with stage 5 CKD prior to commencement of RRT is not known, but in contrast there are no 'late referrals' in the transplant group as they have all been under long term follow up.

Table 11.11: Analysis by CKD stage for prevalent transplant patients compared with dialysis patients

	Stage 1–2T (⩾60)	Stage 3T (30–59)	Stage 4T (15–29)	Stage 5T (<15)	Stage 5D
Number of patients	3,028	7,537	1,971	321	13,715
% of patients	23.6	58.6	15.3	2.5	
eGFR ml/min/1.73 m^2					
mean ± SD	73.0 ± 12.5	44.9 ± 8.3	24.0 ± 4.0	11.4 ± 2.6	
Median	69.6	44.8	24.6	12.1	
Systolic BP					
mean ± SD	134.5 ± 18.7	137.4 ± 19.2	141.6 ± 20.7	143.2 ± 22.1	131.4 ± 25.6
% ⩾130 mmHg	58.6	65.7	74.4	70.8	50.3
Diastolic BP					
mean ± SD	77.7 ± 10.8	78.6 ± 10.6	79.1 ± 11.6	80.7 ± 13.3	71.4 ± 14.5
% ⩾80 mmHg	46.8	49.4	51.6	54.2	28.2
Cholesterol					
mean ± SD	4.7 ± 1.0	4.8 ± 1.0	4.8 ± 1.1	4.8 ± 1.4	4.1 ± 1.1
% ⩾5 mmol/L	35.8	38.4	40.5	35.3	18.4
Haemoglobin					
mean ± SD	13.8 ± 1.6	12.9 ± 1.6	11.7 ± 1.6	11.0 ± 1.7	11.7 ± 1.6
% <10 g/dl	1.1	3.1	11.4	27.4	13.3
Ferritin					
median	103.5	126.0	171.5	230.7	388.0
% ⩽100 µg/L	49.5	41.9	30.9	22.2	6.2
Phosphate*					
mean ± SD	0.9 ± 0.2	1.0 ± 0.2	1.2 ± 0.3	1.6 ± 0.4	1.6 ± 0.5
% ⩾1.8 mmol/L	0.1	0.3	3.0	26.0	30.0
Corrected calcium					
mean ± SD	2.4 ± 0.1	2.4 ± 0.2	2.4 ± 0.2	2.3 ± 0.2	2.4 ± 0.2
% >2.6 mmol/L	9.5	9.8	5.9	7.2	10.5
% <2.1 mmol/L	3.9	5.6	11.5	24.7	13.8
iPTH					
median	8.4	9.9	16.6	31.5	23.4
% ⩾32 pmol/L	7.1	6.5	21.9	49.7	39.2
Albumin g/L**					
mean ± SD	41.9 ± 3.8	41.4 ± 3.8	39.9 ± 4.1	38.1 ± 5.3	38.4 ± 4.8
Bicarbonate mmol/L					
mean ± SD	26.4 ± 3.0	25.6 ± 3.4	23.4 ± 3.6	21.5 ± 4.0	24.0 ± 3.8

* Only PD patients included in stage 5D, n = 2,697.
** Only patients with BCG assay included: transplant patients n = 10,640, only HD patients included n = 7,421.
Note: prevalent transplant patients with no ethnicity data were classed as White.
Laboratory data from last 2 quarters in 2005 used for this analysis. For stage 5D, incident dialysis patients in 2005 were excluded.

Reference

1. Hariharan S, McBride MA, Cherikh WS *et al.* Post transplant renal function in the first year predicts long term kidney transplant survival. *Kidney International* 2002;61(2):311–318.