

## Section H VASCULAR ACCESS FOR HAEMODIALYSIS

Details of vascular access used for haemodialysis for all hospital and home haemodialysis patients were collected during the annual SRR census in the first week of May 2011 or as soon as possible thereafter. Vascular access details were available for 1810 patients, 96.5% of the 1877 prevalent HD patients on 02 May 2011.

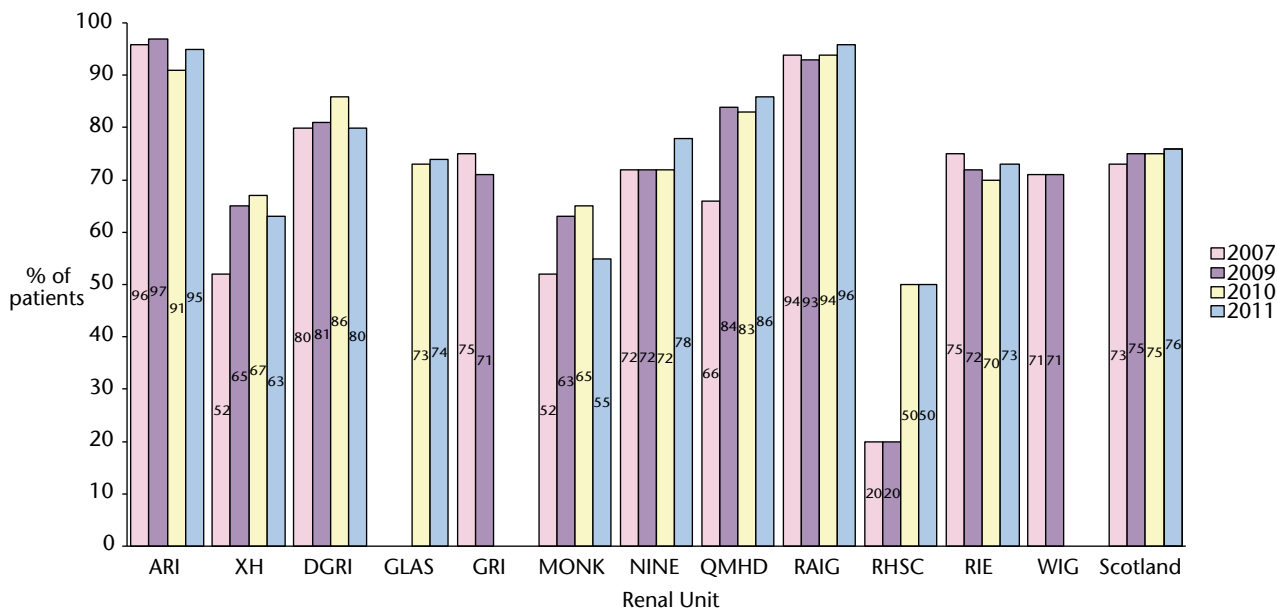
H1 Types of vascular access for haemodialysis patients May 2011		
Type of Access	Number	Percentage
Arteriovenous	1369	75.6
Fistula	1275	70.4
Graft	54	3.0
AV access – details not known	40	2.2
Catheter	441	24.4
Tunnelled	405	22.4
Non-tunnelled	36	2.0
<b>Total</b>	<b>1810</b>	<b>100</b>

Of the 1810 patients with data, 1369 (75.6%) patients were using arteriovenous (AV) access and 441 (24.4%) patients with central venous catheters (CVC). As in previous years, males were significantly more likely than females to have AV access (79% v 70%; Chi square  $p < 0.001$ ). Age did not affect rates of AV access.

There were significant differences between diagnosis groups (Chi square  $p < 0.01$ ); patients with glomerulonephritis were most likely to have AV access (81%) and those with diabetic nephropathy least likely (71%).

Only 48% of patients who had started RRT up to 180 days before data collection had AV access, compared with 79% of those who started RRT more than 360 days before (Chi square  $p < 0.001$ ). However, those who had started 181-360 days prior to data collection were not significantly less likely to have AV access than those who had started earlier (74% v 79%; Chi square  $p > 0.05$ ).

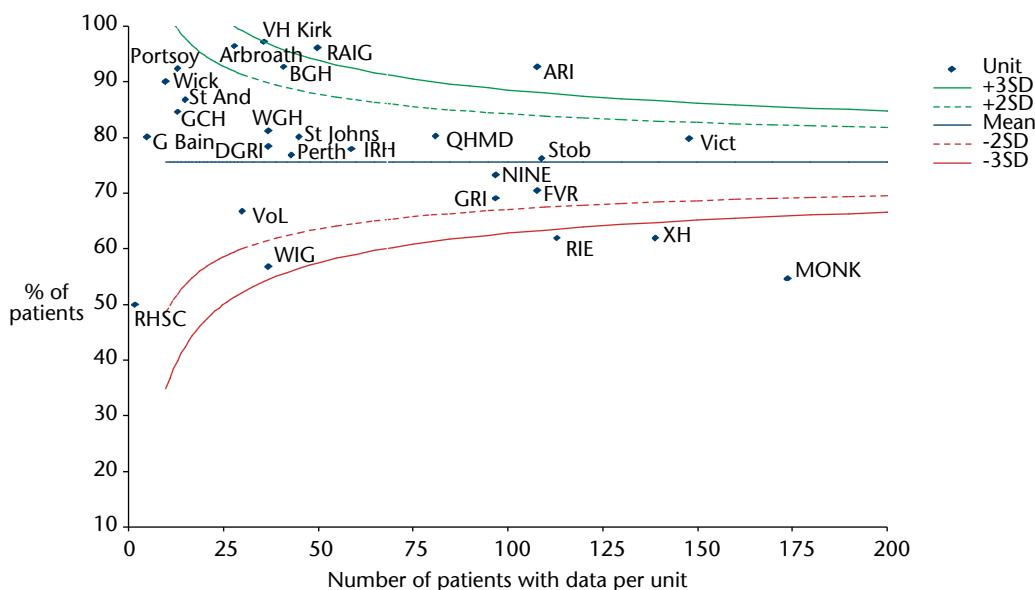
**H2 Percentage of haemodialysis patients with AV access by renal unit: Census results 2007, 2009, 2010 and May 2011**



The percentage of HD patients (with data) using AV access ranged from 55% to 100% in the adult units. H2 shows the percentage AV access (in patients with data submitted) by parent unit from each census 2007 to 2011. GRI and WIG units merged in 2010, data from those units are shown separately for 2007 and 2009 and amalgamated thereafter.

H3 shows the percentage of AV access in 2011 in each unit, with all satellite and main units shown individually.

**H3 Percentage of patients with AV access by dialysis unit May 2011**



Balfour, GH Elgin, Inverurie, Peterhead, BHFV, WI all had 100% prevalence of AV access and are not shown on the funnel plot to enhance clarity.

## Section I BONE MINERAL METABOLISM

The Scottish Renal Registry began to audit data on serum calcium, phosphate (PO<sub>4</sub>) and parathyroid hormone (PTH) in 2009.

In May 2011 pre-dialysis blood samples were collected after a short interdialytic gap from all prevalent haemodialysis patients in Scotland. Any samples marked 'post haemodialysis' were excluded.

The recommendations of the Working Group of Senior Scottish Clinical Biochemists on bone biochemistry targets in the management of renal failure, which Scottish biochemists have agreed to adopt, are available on the SRR website.

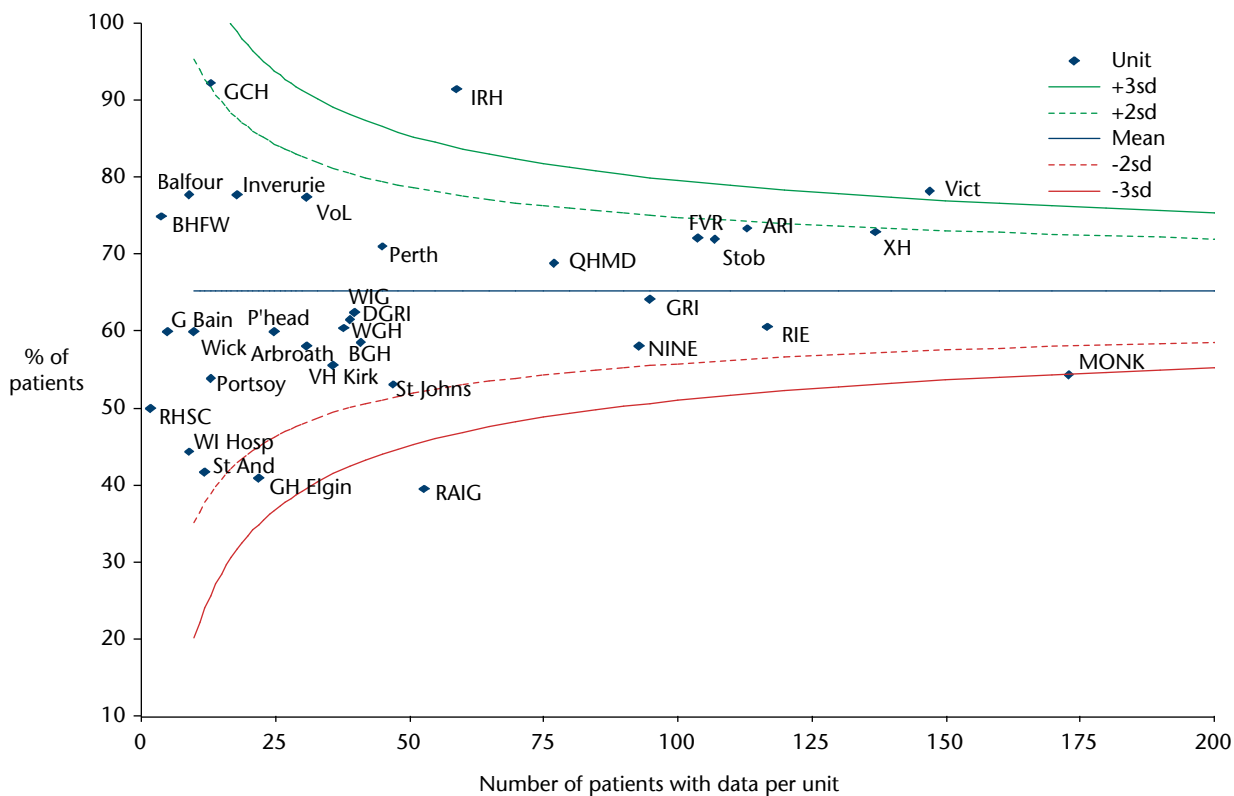
[http://www.srr.scot.nhs.uk/projects/PDF/CA\\_Albumin\\_Background.pdf](http://www.srr.scot.nhs.uk/projects/PDF/CA_Albumin_Background.pdf)

These recommendations have now been largely implemented, and in this report of data from May 2011 the SRR is able to report PTH according to the recommended assay specific targets appropriate to each renal unit for the first time.

<b>I1 Mean phosphate, corrected calcium, PTH and achievement of audit standards in haemodialysis patients by renal unit May 2011</b>								
Renal Unit	Number of patients	% with PO <sub>4</sub> result	Mean PO <sub>4</sub> mmol/L	% with result <1.7 mmol/L	% with cCa result	% with cCa in normal range	% with PTH result	% PTH result 2-9x UL* normal
ARI	212	99.1	1.56	67.1	100	82.1	78.3	45.2
XH	148	98.0	1.43	73.1	98.0	72.3	93.9	45.9
DGRI	52	100	1.46	69.2	100	59.6	11.5	66.7
GLAS	624	96.8	1.54	72.7	96.8	79.5	14.4	44.4
MONK	175	99.4	1.68	54.6	99.4	92.0	92.0	73.9
NINE	178	95.5	1.68	61.2	98.9	60.1	78.1	66.2
QMHD	139	89.9	1.59	62.4	89.9	79.1	81.3	54.0
RAIG	81	93.8	1.77	44.7	93.8	82.7	75.3	52.5
RHSC	2	100	1.57	50.0	100	100	0	
RIE	266	97.7	1.4	59.2	98.5	72.6	80.8	67.4
<b>Scotland</b>	<b>1877</b>	<b>96.9</b>	<b>1.54</b>	<b>65.3</b>	<b>97.4</b>	<b>77.9</b>	<b>56.6</b>	<b>58.3</b>

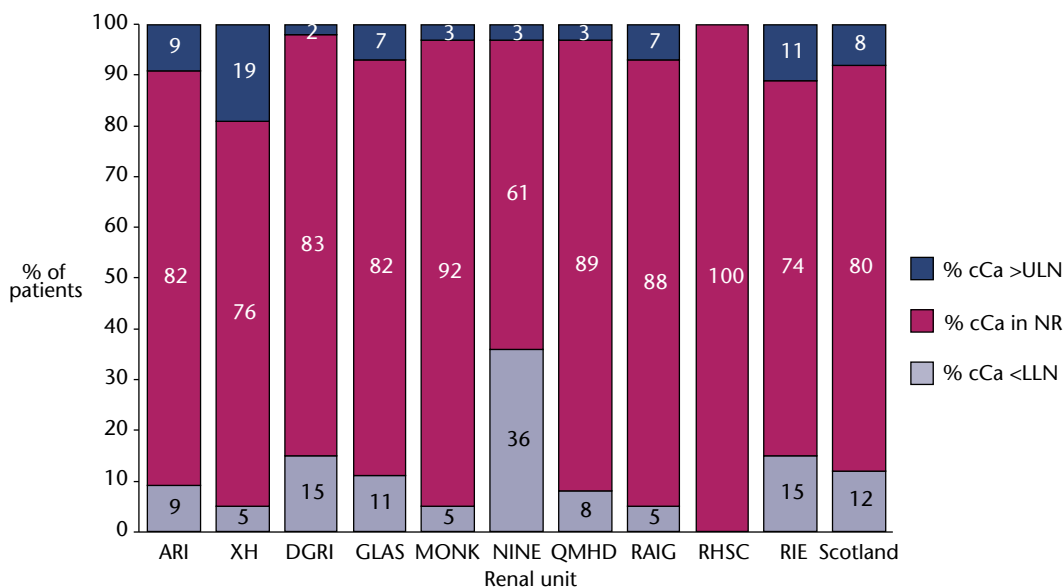
\* UL-upper limit of normal  
% of patients with data with PTH results 2-9x UL normal range.

**12 Percentage of patients achieving pre-HD PO4 target of <1.7 mmol/L by dialysis unit May 2011**



Analytical methods for phosphate are fairly standard across Scotland and therefore results are comparable both between units and against the UKRA guideline (Pre HD PO4 <1.7 mmol/L).

**13 Distribution of pre HD corrected serum calcium in haemodialysis patients by renal unit May 2011**



The graph shows the percentage of patients within each unit, who were hypocalcaemic (cCa < lower limit of normal range (LLN)), normocalcaemic (cCa in normal range (NR)) and hypercalcaemic (cCa > upper limit of normal range (ULN)) according to the local assay ranges for the biochemistry laboratory serving each main renal unit.

The UKRA guideline suggests that cCa should be maintained within the local normal range. The normal range differs between renal units and therefore direct comparison of calcium results is not meaningful.

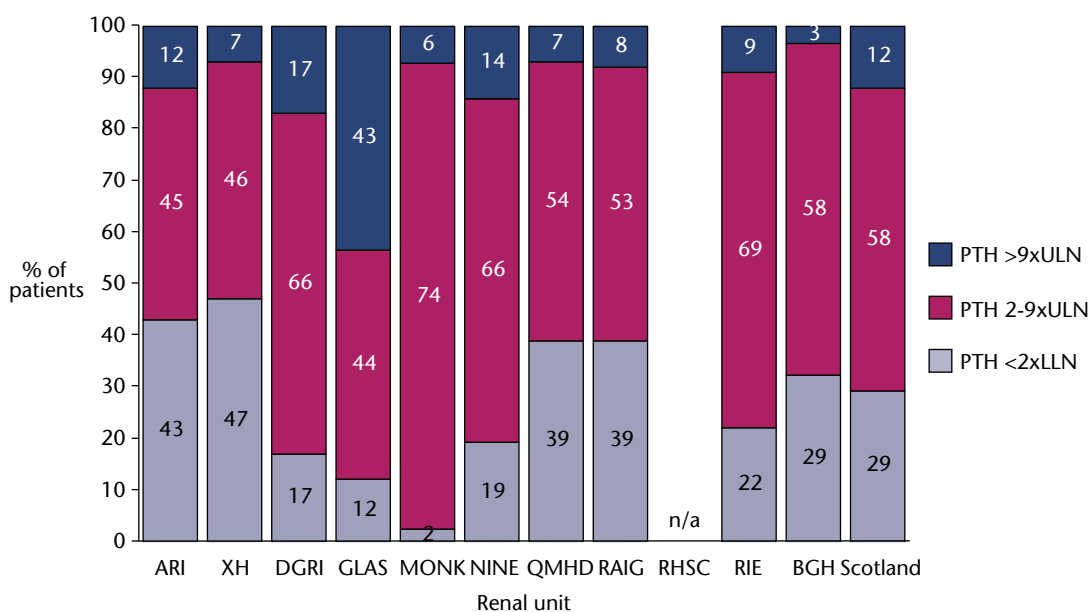
In 2010 the Scottish Biochemists society agreed to adopt a standard formula to correct calcium for albumin concentration:

$$cCa = \text{measured serum calcium} + [(40 - \text{serum albumin (g/L)}) \times 0.02]$$

They also agreed that calcium should not be corrected if the albumin is <25 g/L. The implementation of these changes across Scotland is still in progress.

Patients with very low albumin were included in this current report, this affects 3.1% of cCa results reported.

**14 Distribution of pre HD serum PTH in haemodialysis patients by renal unit May 2011**



BGH is a satellite dialysis unit of RIE, PTH is analysed locally using a different assay to RIE and results are given separately.

The PTH data remain incomplete; results were available for only 1062 (57%) of the 1877 prevalent HD patients on 02 May 2011.

The UKRA guideline was revised in January 2011 and now states that PTH levels should be maintained between 2 and 9 times the upper limit of normal for the assay used. This widening of acceptable limits has improved the number of patients achieving the target from less than one third in 2009, to 58% in 2011.

Results are stratified into 3 groups: less than twice the upper limit of the assay specific normal range (ULN), 2-9 times greater than the ULN, and more than 9 times the ULN for the PTH assay used.

There are currently 5 PTH assays in use across Scotland, each with slightly different normal ranges and each performing very differently in detection of PTH. In 2010 the Scottish Biochemists agreed to adopt the recommendations of the PTH Working Group which include assay specific target ranges for PTH in CKD 4 and 5 and the standard unit picomol per litre (pmol/L) for reporting. The data in this report take account of the local PTH assay, normal range, and appropriate range in CKD 4 and 5 in use in each renal unit.

## Section J ANTHROPOMETRIC MEASUREMENTS OF HAEMODIALYSIS PATIENTS

Patients' measured height and weight were recorded in the May 2011 census, all patients receiving hospital or home haemodialysis (HD) on 02 May 2011 were included. Height and weight measurements were available for 1721 (91.7%) of the 1877 prevalent HD patients.

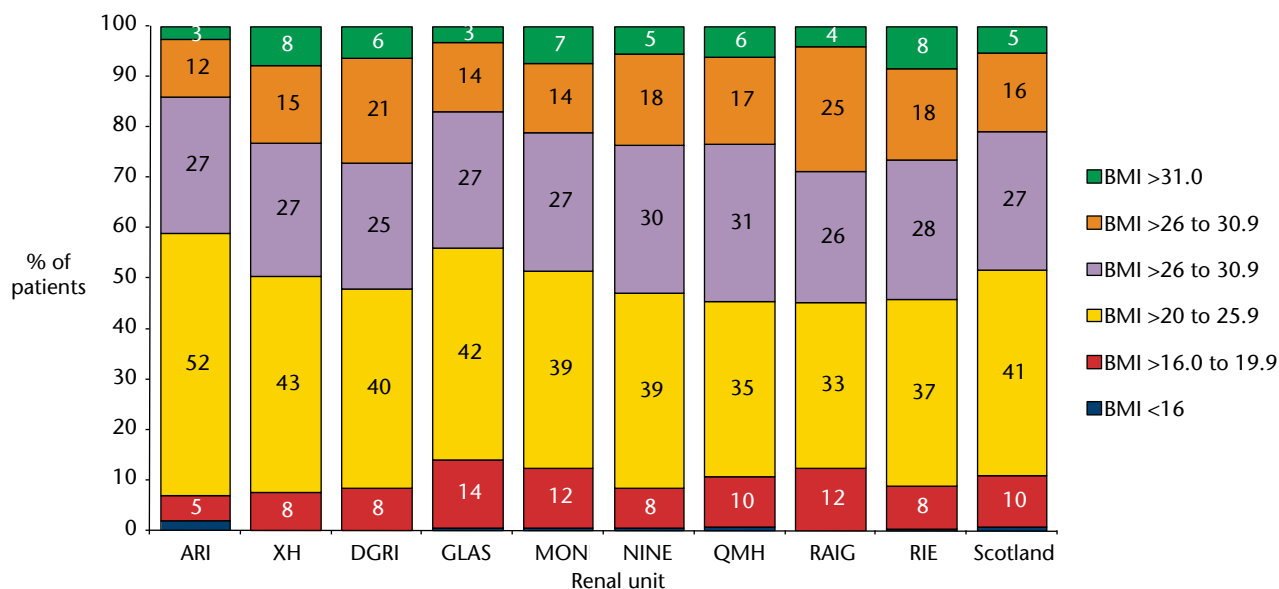
Body mass index (BMI) can be calculated using height and weight in adult patients.

Patients aged under 18 (2 patients) are excluded from the analyses.

The data collection forms and methods are available on the SRR website:

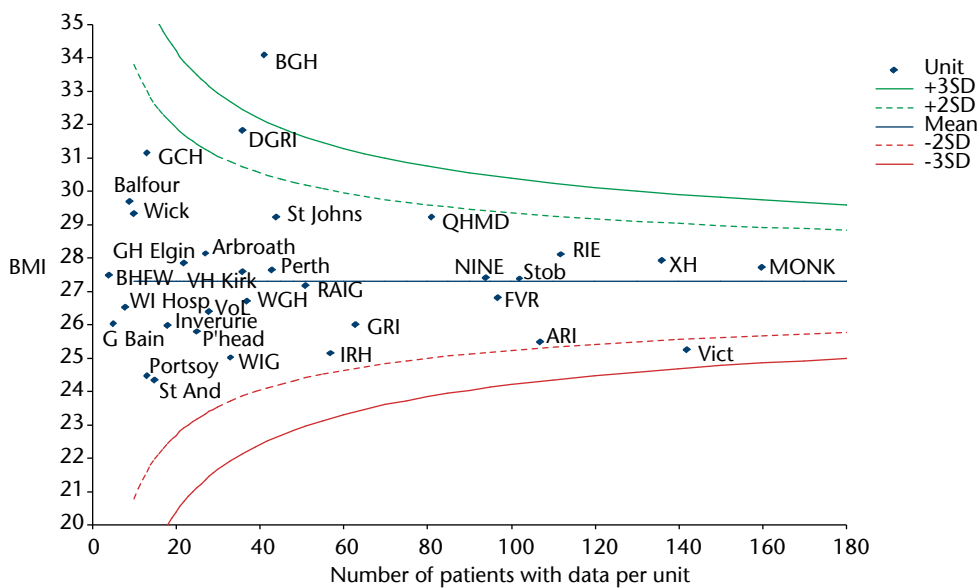
<http://www.srr.scot.nhs.uk/About/Guide.htm>

**J1 Distribution of BMI (kg/m<sup>2</sup>) by parent renal unit May 2011**



All units have a similar percentage of patients with a BMI under 20 (range 7-15%), which is a recommended UK Renal Association audit measure for under nutrition.

**J2 Distribution of mean BMI (kg/m<sup>2</sup>) by dialysis unit May 2011**



The mean BMI of HD patients in Scotland was 27.3 kg/m<sup>2</sup> (overweight).



## Section K CAUSE OF DEATH

The cause and location of death of patients treated by RRT in Scotland has been collected routinely since 2008 as part of the Scottish Mortality Audit of Renal Replacement Therapy (SMARRT).

Cause of death has been coded in accordance with ERA-EDTA codes and aggregated into the following main groups: Cardiovascular, Infection, Dialysis Complication, Treatment Withdrawal, Malignancy and Other.

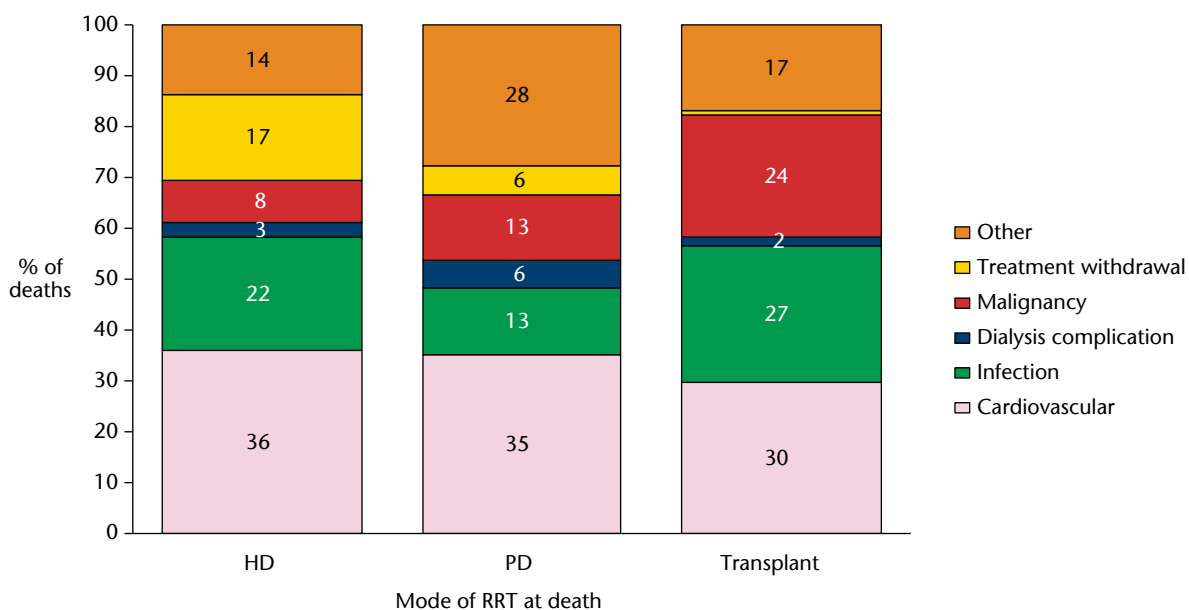
Dialysis Complication includes deaths due to: Hyperkalaemia, Haemorrhage from vascular access, Ruptured AV fistula, PD peritonitis and Sclerosing peritonitis.

A list of the ERA-EDTA codes and grouping is available on the SRR website:

<http://www.srr.scot.nhs.uk/Projects/methods.html>

Data reported here relates to the deaths of patients occurring in the two years between 01 January 2008 and 31 December 2009. There were 888 deaths among RRT recipients. Cause of death data is available for 855 (96%) and information on location of death is available for 808 (92%).

### K1 Cause of death and modality of RRT at death 2008-2009



<b>K2 Location of patient death 2008-2009</b>		
<b>Location</b>	<b>Number of patients</b>	<b>Percentage of patients</b>
Home	166	18.7
Hospital	625	70.2
Hospice	11	1.2
Nursing Home	11	1.2
Unknown	75	8.4
<b>Total</b>	<b>888</b>	<b>100</b>