

Section I BONE MINERAL METABOLISM

The Scottish Renal Registry began to audit data on serum calcium, phosphate (PO₄) 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.

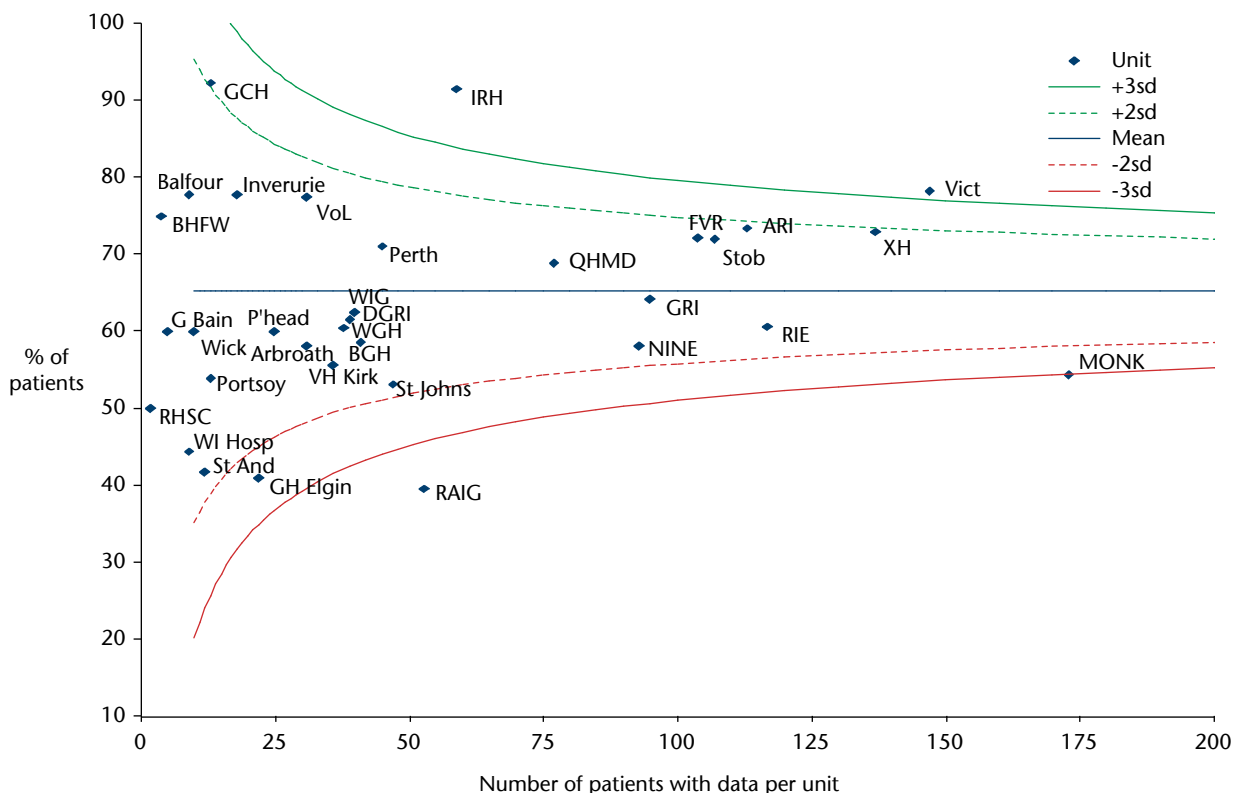
http://www.srr.scot.nhs.uk/projects/PDF/CA_Albumin_Background.pdf

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.

I1 Mean phosphate, corrected calcium, PTH and achievement of audit standards in haemodialysis patients by renal unit May 2011								
Renal Unit	Number of patients	% with PO ₄ result	Mean PO ₄ 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
Scotland	1877	96.9	1.54	65.3	97.4	77.9	56.6	58.3

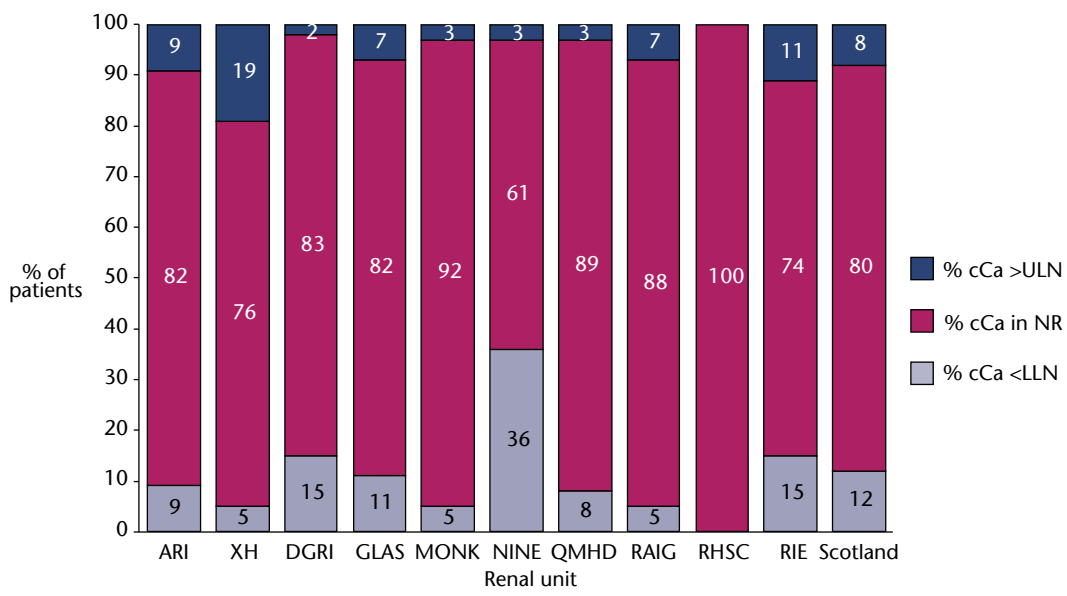
* UL-upper limit of normal
% of patients with data with PTH results 2-9x UL normal range.

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.

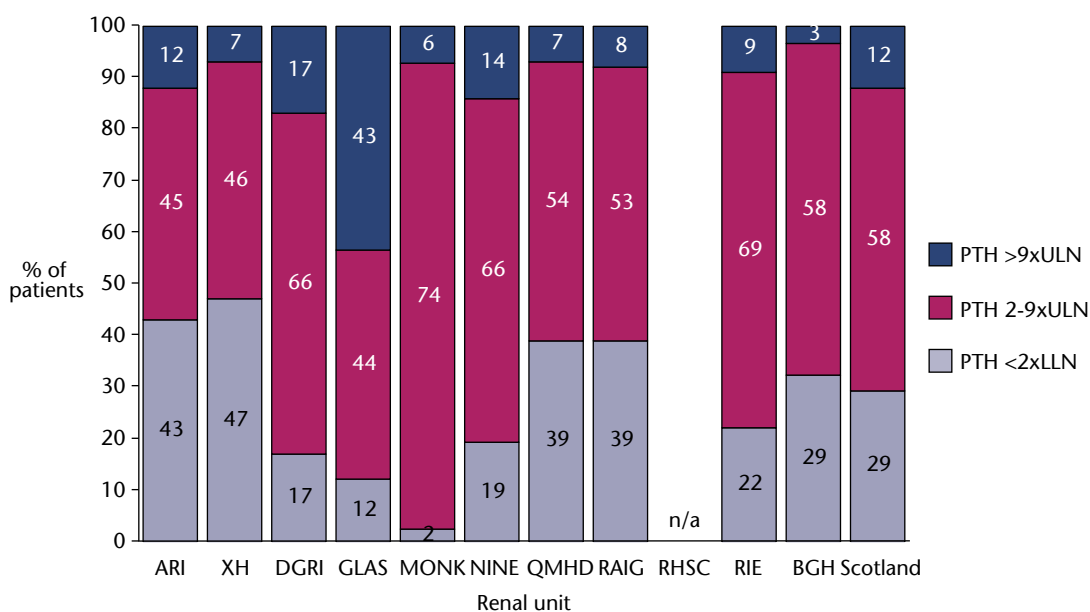
In 2010 the Scottish Biochemists society agreed to adopt a standard formula to correct calcium for albumin concentration:

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

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.