CKD-MBD Data
November 2012

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on behalf of the Scottish Renal Registry

Guideline 3.2 CKD-MBD: Serum phosphate in dialysis patients (stage 5D)

We suggest that serum phosphate in dialysis patients, measured before a “short-gap” dialysis session in haemodialysis patients, should be maintained between 1.1 and 1.7 mmol/L (2C).

Hyperphosphataemia is associated with increased morbidity and mortality in dialysis patients. In a large cross-sectional and retrospective analysis of over 40,000 haemodialysis patients, the lowest relative risk of death was associated with serum phosphate concentrations between 0.97 - 1.6 mmol/L. Renal Registry data shows .. the lowest risk of death at serum phosphate concentrations between 1.1 and 1.8 mmol/L..... we recommend lowering the upper limit for phosphate to1.7 mmol/l.

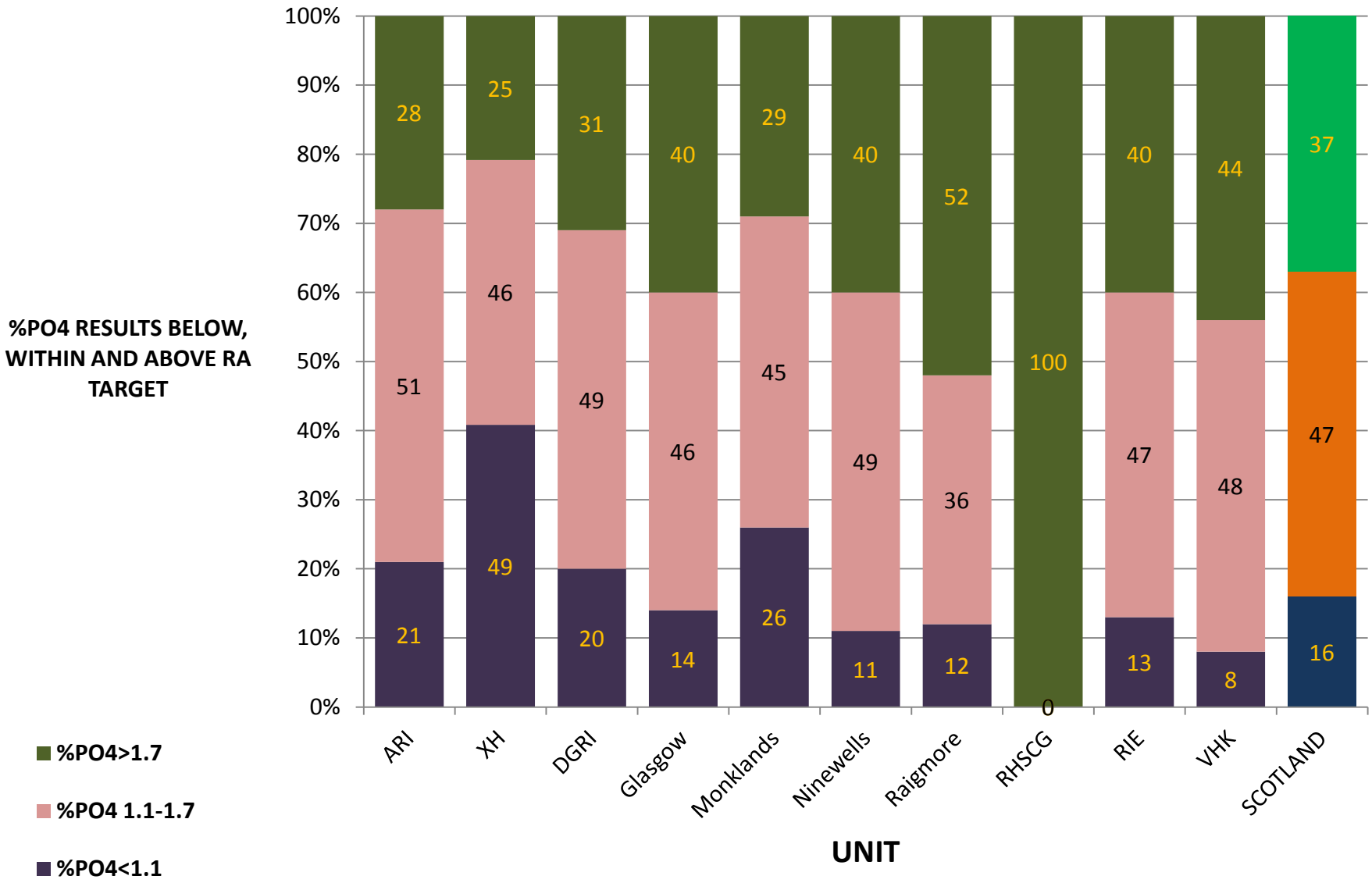
Dhingra R, Sullivan L, Fox CS et al. Relations of serum phosphorus and calcium levels to the incidence of cardiovascular disease in the community.
Arch Intern Med 2007; 167: 879-884

Block G, Klassen P, Lazarus J et al. Mineral metabolism, mortality, and morbidity in maintenance hemodialysis.
J Am Soc Nephrol 2004; 15:2208–18

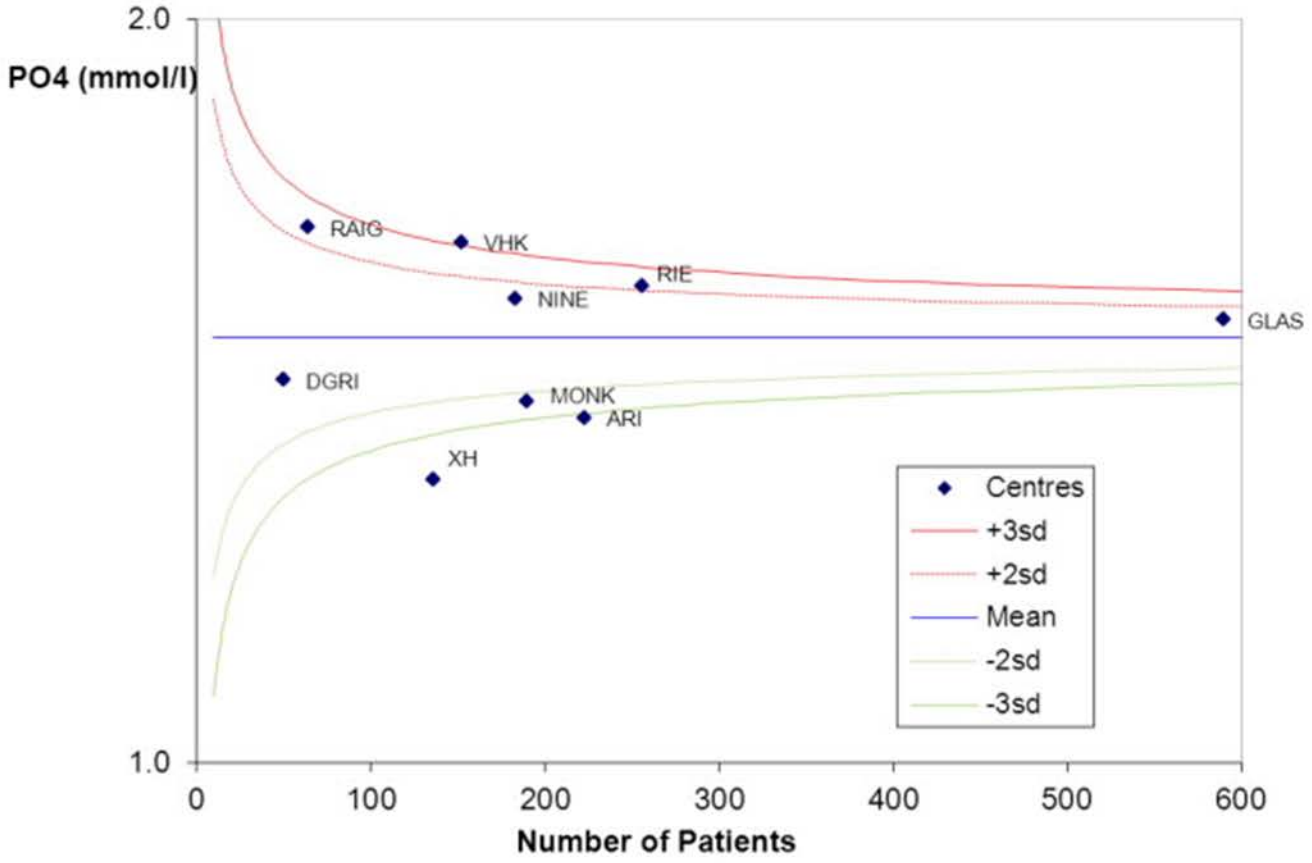
Covic A, Kothawala P, Bernal M et al. Systematic review of the evidence underlying the association between mineral metabolism disturbances and risk of all-cause mortality, cardiovascular mortality and cardiovascular events in chronic kidney disease. Nephrol Dial Transplant 2009; 24: 1506-1523

Tentori F, Hunt WC, Rohrscheib M et al. Which targets in clinical practice guidelines are associated with improved survival in a large dialysis organization?
J Am Soc Nephrol 2007; 18: 2377-2384

PHOSPHATE RESULTS BY UNIT: November 2012

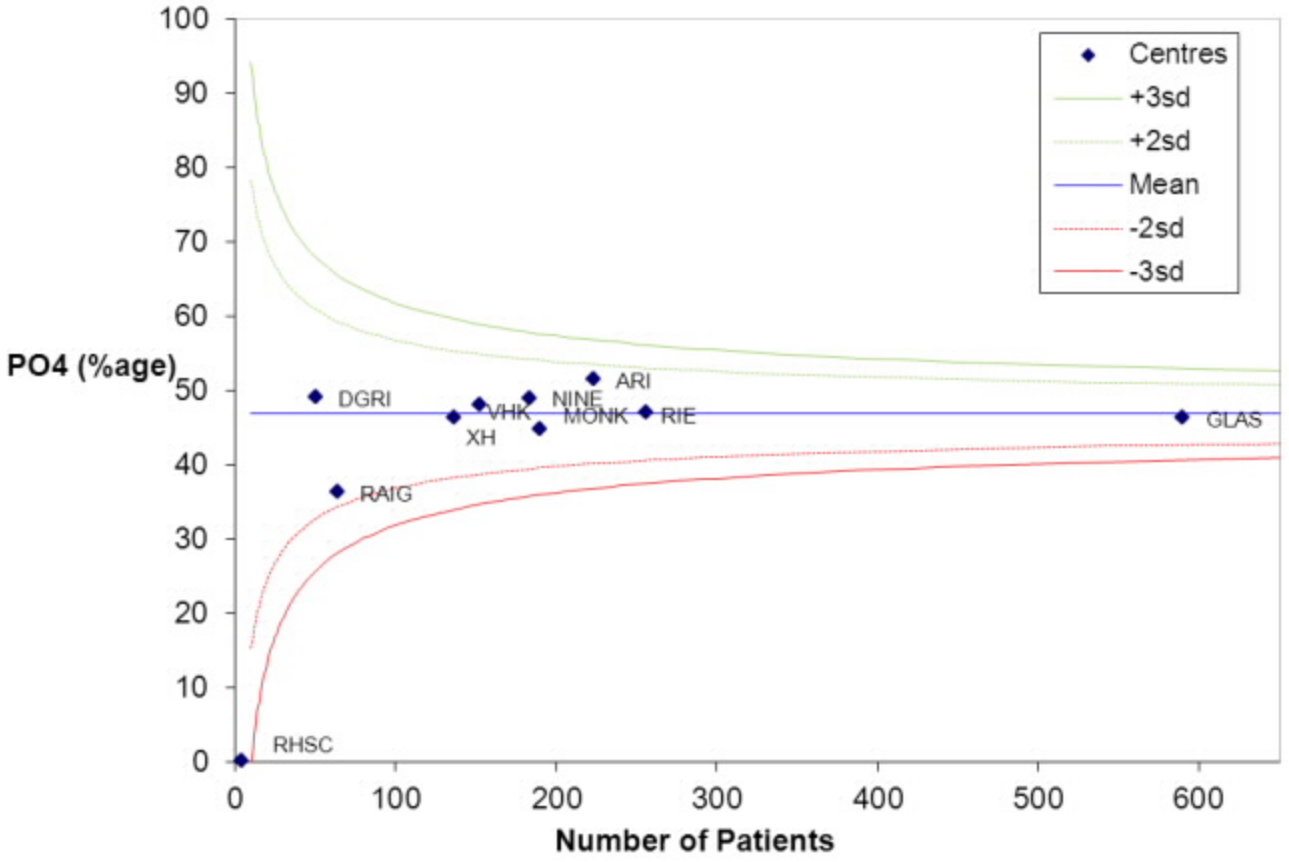


Mean Phosphate:
Analysis includes only those patients with results



Percentage of patients meeting phosphate target 1.1-1.7

Analysis included only those patients with results



Guideline 2.2 CKD-MBD: Serum calcium in dialysis patients (stage 5D)

We suggest that serum calcium, adjusted for albumin concentration, should be maintained within the normal reference range for the laboratory used, measured before a “short-gap” dialysis session in haemodialysis patients.

Ideally, adjusted serum calcium should be maintained between 2.2 and 2.5 mmol/L, with avoidance of hypercalcaemic episodes (2D).

There is some evidence that..... calcium concentrations have an independent association with relative mortality risk .

Kovesdy C, Kuckmak O, Lu JL, Kalantar-Zadeh K. Outcomes associated with serum calcium level in men with non-dialysis-dependent chronic kidney disease.

Clin J Am Soc Nephrol 2010; 5: 468-476

In a large retrospective review of over 40,000 haemodialysis patients, all cause mortality was relatively higher the higher the corrected calcium level, after adjustment for gender, age, dialysis vintage and diabetes .

Wald R, Sarnak M, Tighiouart H et al. Disordered mineral metabolism in haemodialysis patients: An analysis of the cumulative effects in the Haemodialysis Study (HEMO).

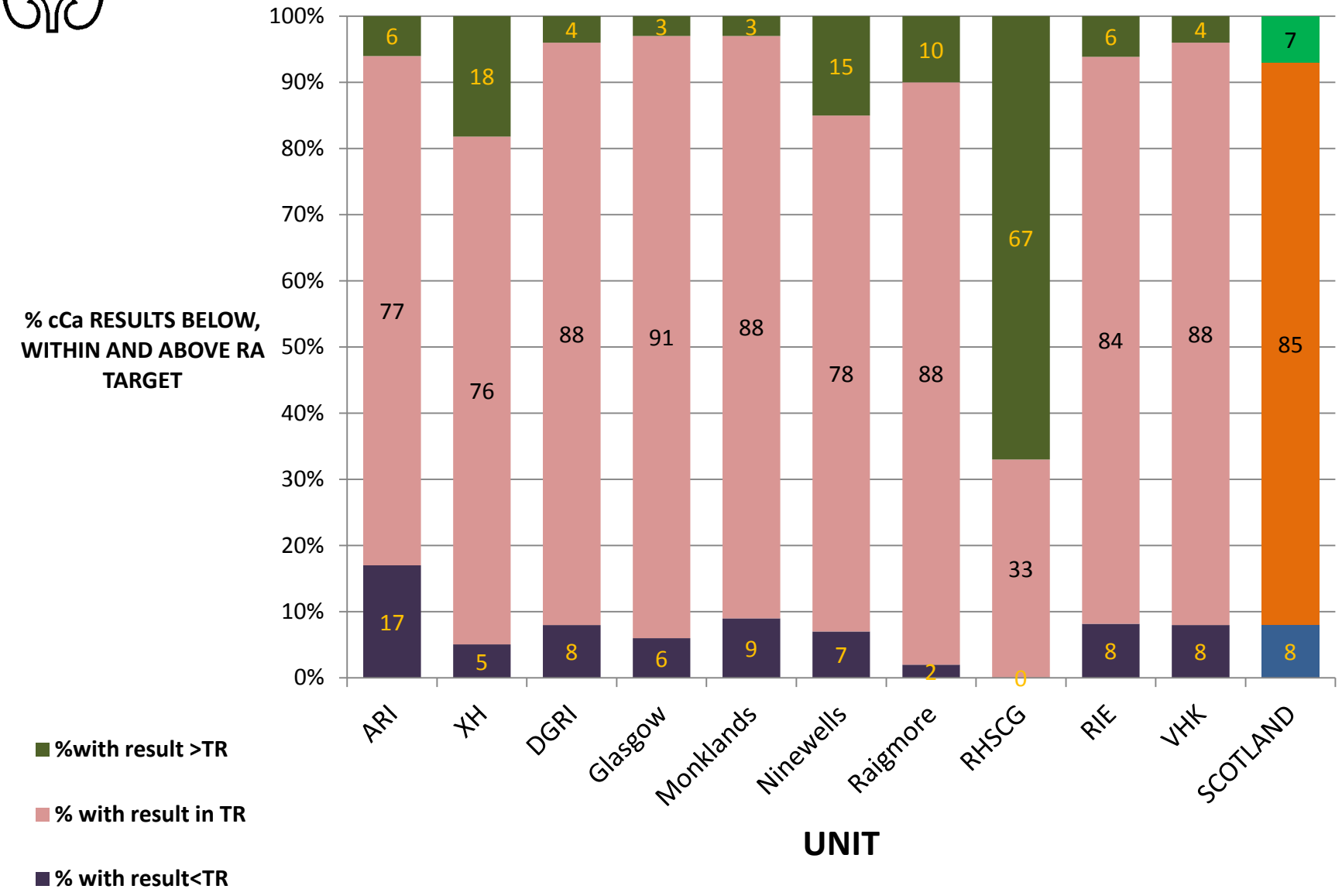
Am J Kidney Dis 2008; 52: 531-540

Observational data from the DOPPS study.... 17,236 haemodialysis patients from 307 participating centres ... all-cause mortality associated with a increased RR for each 0.25 mmol/L increase in calcium. There was an increased relative risk associated with calcium levels less than 2.2 mmol/L. Cumulative time dependent analysis of the DOPPS study shows that calcium values >2.65 are associated with significant hazard ratio for all cause mortality (1.66 (1.09-2.55)).

Tentori F, Blayney M, Albert JM et al. Mortality risk for dialysis patients with different levels of serum calcium, phosphorus, and PTH: The Dialysis Outcomes and Practice Patterns Study (DOPPS).

Am J Kidney Dis 2008; 52: 519-530.

SERUM ADJUSTED CALCIUM BY UNIT: November 2012



Guideline 4.2.1 CKD-MBD: Target range of serum PTH in patients on dialysis

We suggest that the target range for parathyroid hormone measured using an intact PTH assay should be between 2 and 9 times the upper limit of normal for the assay used (2C).

In the dialysis population, the PTH target focuses on avoidance of risk at extremes of PTH; i.e. at <2x or >9x the upper limit of the normal reference range. The 'multiplication' reference range accommodates the significant variation in PTH levels between assays and laboratories. Intact PTH levels do not consistently predict bone histology, particularly if considered in isolation. The level at which PTH becomes significantly associated with increased all cause mortality varies among studies from 400-600pg/mL (2-6). The suggested PTH range corresponds to approximately 130-600pg/mL, depending on the assay used. There will not be uniform agreement around this target and we note concerns being less stringent may risk refractory hyperparathyroidism, but it seems appropriate to harmonise guidelines on the basis of available evidence. The percentage of CKD stage 5D patients undergoing parathyroidectomy is proposed as an audit standard.

Block GA, Klassen PS, Lazarus JM et al. Mineral metabolism, mortality, and morbidity in maintenance hemodialysis.
J Am Soc Nephrol 2004; 15:2208–2218

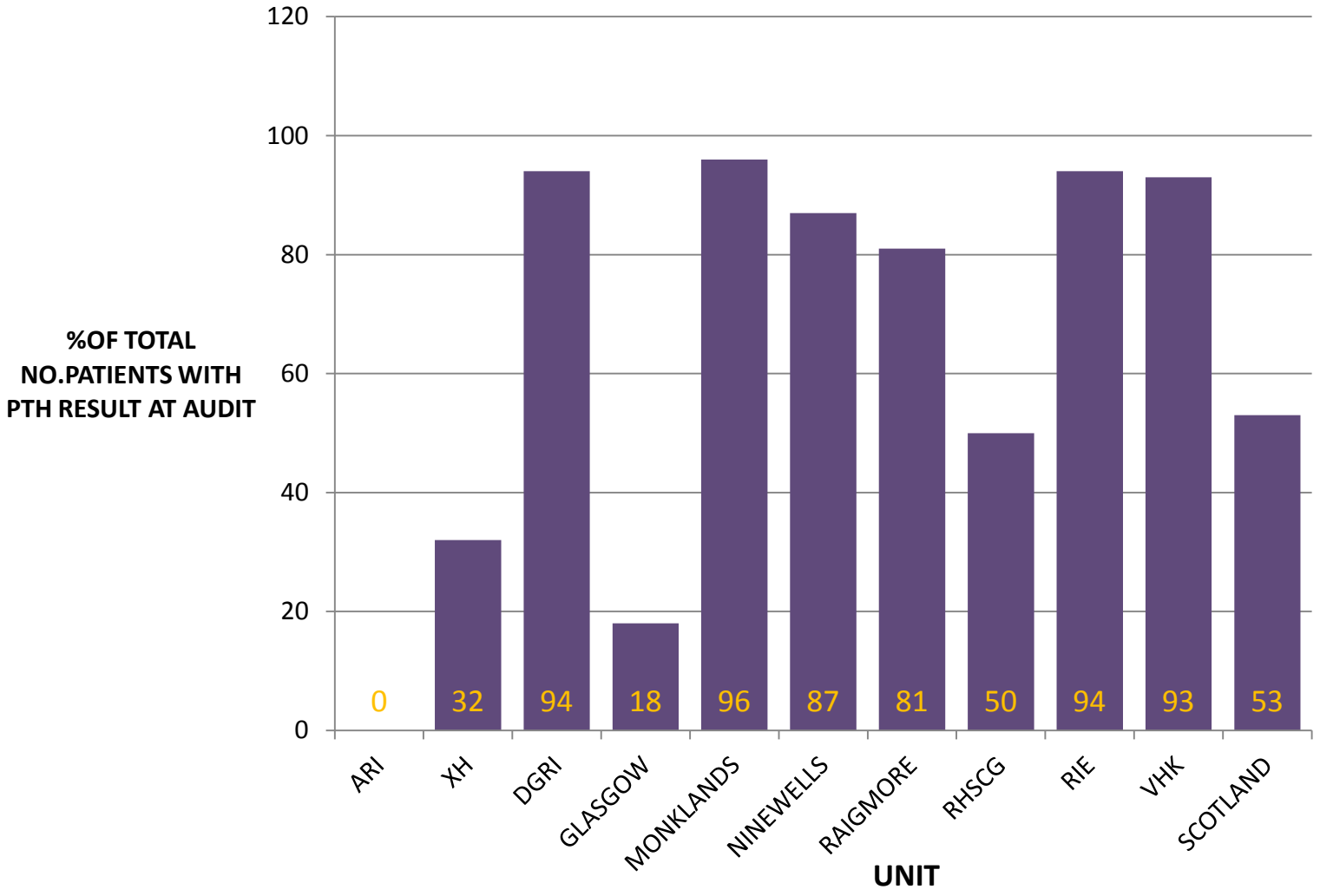
Block GA, Hulbert-Shearon TE, Levin NW et al. Association of serum phosphorus and calcium x phosphate product with mortality risk in chronic hemodialysis patients: a national study.
Am J Kidney Dis 1998; 31: 607–617

Kalantar-Zadeh K, Kuwae N, Regidor DL et al. Survival predictability of time-varying indicators of bone disease in maintenance hemodialysis patients.
Kidney Int 2006; 70: 771–780

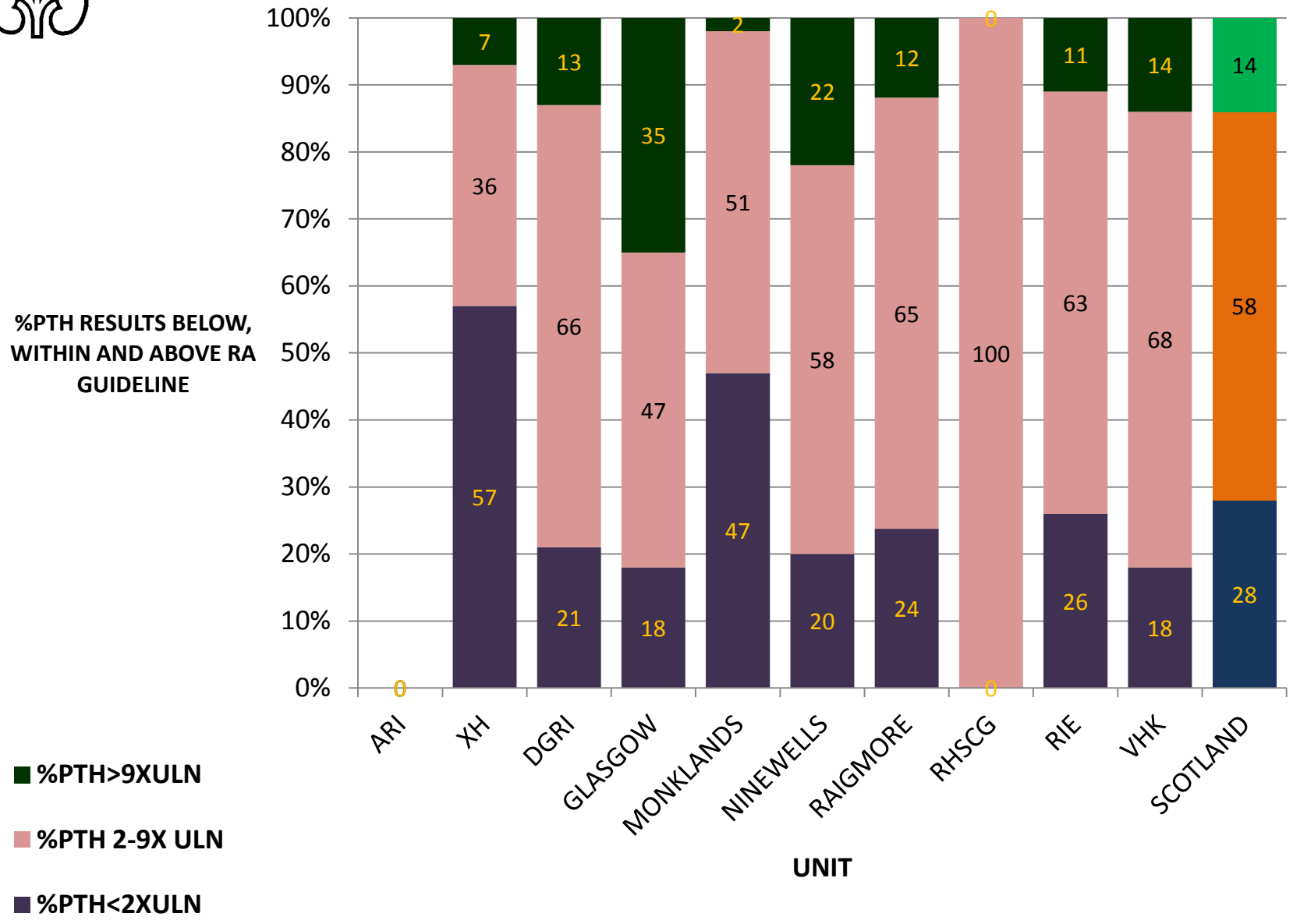
Kimata N, Albert JM, Akiba T et al. Association of mineral metabolism factors with all-cause and cardiovascular mortality in hemodialysis patients: the Japan dialysis outcomes and practice patterns study
Hemodial Int 2007; 11: 340–348

Young EW, Albert JM, Satayathum S et al. Predictors and consequences of altered mineral metabolism: the Dialysis Outcomes and Practice Patterns Study.
Kidney Int 2005; 67: 1179–1187

% PATIENTS WITH PTH RESULT BY UNIT: November 2012



PTH RESULTS BY UNIT: November 2012



PTH BY UNIT, USING OLD RA GUIDELINES