Parathyroidectomy in patients with CKD

Pre Operative Care

- **Alfacalcidol 2mcg bd** should be given for 3 days prior to surgery.
- **Cinacalcet** should be stopped one week before parathyroidectomy.

Patients at risk of **hungry bone syndrome** should be identified per Appendix 1.

Post Operative Care

Patients should be admitted to ward 215 post operatively and prescribed:

- **Alfacalcidol 2mcg bd**
- **Calvive (formally Sandocal1000) 2 tablets tds** - Do not take at mealtimes.
- Hold phosphate binders.

Serum corrected calcium should be measured every 6 hours for the first 24 hours post surgery, and then less frequently if stable.

Aim for normal serum calcium values (2.2-2.6 mmol/L). Increase calcium supplementation by 50% if calcium falling and half the dose if calcium starts to rise.

Pay attention to the trend. If the corrected calcium is falling rapidly i.e. >10% over 6 hrs the development of significant hypocalcaemia is likely and requires more frequent monitoring.

If calcium <1.8 or if symptomatic, give IV calcium as detailed in Appendix 2.

Monitor serum phosphate and magnesium 12 hourly for first 24hrs, then daily.
Do not treat hypophosphataemia unless serum phosphate falls below 0.35 mmol/l.
Consider higher calcium dialysate (A232, A231 containing calcium 1.5 mmol) or PD fluid.

Post Discharge

RRT patients: Monitor serum calcium on each HD session or 3 times a week (for PD patients) for the first two weeks and weekly checks as required thereafter until stability is reached.

The dosing of alfacalcidol and calcium supplements post operatively is challenging and both hypo- and hypercalcaemia are common. Trends in concentration are more important than absolute values. Consider the following:

- Check adherence and adjust calcium supplement by +- 50%.
- Alfacalcidol dose to increase up to a maximum of 5 micrograms bd but note it takes 3 days to observe effect of increase in dose. Alfacalcidol product specification recommends increasing dose in increments of 0.25 – 0.5 micrograms but if taking 2 micrograms or more change dose by 1 microgram.
- Check magnesium levels and replace if recurrent /resistant hypocalcaemia.

Appendix 1. Hungry Bone Syndrome

Diagnosis hinges on a profound and persistently low calcium level of less than 2.1 mmol/L for more than four days postoperatively along with hypophosphatemia and normal PTH levels. Such patients require prolonged, high dose calcium to maintain serum calcium levels. Often there is also associated hypomagnesemia and hypocalciuria. Risk factors include:

- Alkaline phosphatase > 2 times upper limit of normal
- PTH levels> 100 pmol/L
- Radiologic evidence of bone disease
- Higher BMI
- Higher BUN

Appendix 2. IV Calcium Infusion

Use **calcium gluconate** over calcium chloride. Care must be taken to ensure intravenous calcium is not extravasated. If central line is available this is likely to be most suitable access. If venous access is not secure, then a central line may be considered.

Infusion
100ml of 10% **calcium gluconate** (900mg of elemental calcium) +150 ml of 5% Dextrose (total volume 250 ml). Final concentration is 3.6mg/ml.

- Start infusion at 0.3ml/kg/hour (1mg/kg/hour. 70kg patient = 21ml/hr)
- Check corrected serum calcium 6 hourly.
- Titrate calcium infusion dose between 0-0.6ml/kg/hour to prevent serum calcium falling below 1.9mmol/L or rising above 2.4 mmol/L.

Severe symptoms include paraesthesia, muscle cramps, carpo-pedal spasm, laryngeal stridor, convulsions, prolonged QT interval, arrhythmias, and hypotension. This will require bolus IV calcium and subsequent infusion.

Emergency Bolus
Emergency situations - Give 10ml of 10% **calcium gluconate** (2.2mmol calcium) no faster than 2ml/min (i.e., Over at least 5mins, ECG monitoring recommended); this can be given peripherally.

Appendix 3. Calcium Content of Common Supplements

Calcium supplements	Calcium Content
Adcal (chewable)	*15 mmol / tablet*
Calcichew(chewable)	*12.6 mmol / tablet*
Calvive/ Sandocal 1000 (soluble)	*25 mmol / tablet*
Calcichew forte(chewable)	*25 mmol / tablet*

(1 mmol = To 40mg Of Elemental Calcium)