Joint Trust Guideline for the Peri-operative Management of Renal Patients Undergoing Total Parathyroidectomy

A clinical guideline recommended for use

For Use in:	Norfolk and Norwich University Hospitals
By:	Medical and surgical staff
For:	Renal patients undergoing total parathyroidectomy surgery
Division responsible for document:	Medical Division (Including Emergency)
Key words:	Calcium, parathyroid, parathyroidectomy, renal
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Description of changes:	Change to Adcal dosages on pages 2 and 3
Compliance links: *(is there any NICE related to guidance)*	None
If Yes - does the strategy/policy deviate from the recommendations of NICE? If so why?	N/A

This guideline has been approved by the Trust's Clinical Guidelines Assessment Panel as an aid to the diagnosis and management of relevant patients and clinical circumstances. Not every patient or situation fits neatly into a standard guideline scenario and the guideline must be interpreted and applied in practice in the light of prevailing clinical circumstances, the diagnostic and treatment options available and the professional judgement, knowledge and expertise of relevant clinicians. It is advised that the rationale for any departure from relevant guidance should be documented in the patient's case notes.

The Trust's guidelines are made publicly available as part of the collective endeavour to continuously improve the quality of healthcare through sharing medical experience and knowledge. The Trust accepts no responsibility for any misunderstanding or misapplication of this document.

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Quick reference guidelines for doctors and nurses

Please also refer to accompanying text

Pre-Admission

- Inform renal team of date of surgery to allow pre-loading with alfacalcidol (eg. 2 micrograms daily for 2 weeks)
- If patient has not been preloaded discuss with Mr Pain and Renal Registrar as to whether surgery should be deferred.

Admission

- Inform renal team of admission
- Check serum calcium
- Prescribe patient's regular medications
- Prescribe 2 micrograms alfacalcidol QDS plus adcal 3000 mg TDS to commence immediately post-operatively

Post-operatively

- Check bone profile **immediately** upon return from theatre and inform renal team
- Recheck serum calcium after 4 hours

Serum corrected calcium drop by <0.4 mmol/L

- Repeat serum calcium 12 hourly until stable

Serum corrected calcium drop by >0.4 mmol/L

- Repeat serum calcium 4-6 hourly until stable
- Inform Hospital at Night team – this is a potential medical emergency

Serum corrected calcium <1.5 mmol/L or patient symptomatic

- Inform renal team
- Consider IV calcium (e.g. 20 ml 10% calcium gluconate over 15 mins)
- Check serum magnesium
- If >2 boluses are required – **Refer to main guideline (may need calcium infusion)**

Inform renal team prior to discharge to organise follow up

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Objective/s

This protocol aims to ensure adequate monitoring of serum calcium following total parathyroidectomy in renal patients.

Rationale

Patients with end stage renal failure may develop significant hyperparathyroidism. If this cannot be controlled medically, these patients may require total parathyroidectomy. When the level of parathyroid hormone (PTH) is reduced immediately following surgery, avid calcium uptake into bones ("hungry bone syndrome") may cause a precipitous reduction in serum calcium. Acute hypocalcaemia can lead to paraesthesiae, tetany, seizures and cardiac arrhythmias. Careful peri-operative calcium management is therefore imperative in these patients.

Broad recommendations

Pre-operatively:

The renal team should be informed well in advance of the date of surgery so that the patient can be pre-loaded with the Vitamin D analogue alfacalcidol (usually 2 micrograms daily for at least 2 weeks prior to surgery).

On admission a pre-operative bone chemistry profile should be sent by the surgical team. The renal registrar should be informed of the admission, and if the patient has not been pre-loaded with alfacalcidol, they will advise whether a pre-operative dose should be administered or whether surgery should be deferred. The admitting surgical team should ensure that the patient's regular medications are prescribed on the drug chart, together with alfacalcidol 2 micrograms QDS and adcal 3000 mg TDS to commence immediately post-operatively. **Ward staff must ensure that these drugs are available and if necessary obtain appropriate supplies from pharmacy**.

Post-operatively:

If all parathyroid tissue has been successfully removed, there should be a rapid post-operative fall in serum calcium. This is not predictable and should be assumed until proven otherwise.

The serum calcium level should be checked immediately on return from theatre and the renal team contacted with the result so that the post-operative regimen of alfacalcidol and calcium can be adjusted if required.

The serum calcium level should be checked again 4 hours later and subsequently rechecked as per the attached flow chart until stable. In the majority of patients, calcium can be controlled using oral therapy only; the renal team will continue to review and advice on this.

In the event of severe (e.g. corrected calcium <1.5 mmol/L) or symptomatic hypocalcaemia, the patient may need intravenous calcium. This should be done *only*

after discussion with the renal team. IV calcium can cause tissue necrosis if extravasated and should be administered peripherally with caution.

- Ensure the patient has a *patent* cannula in a large vein, and administer 20 mL10% calcium gluconate over at least 15 minutes followed by a sodium chloride 0.9% flush. Faster infusions may be arrhythmogenic.
- IV calcium may also be administered on dialysis.
- If the serum calcium is proving difficult to correct, a serum magnesium should be checked and corrected if low (normal range 0.7-0.9 mmol/L). 2 grams (8 mmol) Magnesium Sulphate in 100 ml 0.9% sodium chloride should be administered over 1 hour (4 grams if magnesium level < 0.5 mmol/L).
- Occasionally patients require repeated boluses of IV calcium, in which case a continuous calcium infusion may be necessary. This should ideally be administered *via central venous access* as a calcium solution (e.g. 200 mL 0.9% sodium chloride with 50 ml 10% calcium gluconate) over 2 hours. It can also be given as a neat solution (50 ml 10% calcium gluconate at rate of 10 mL/hour) if fluid restriction is necessary. Calcium infusions may cause nausea, vomiting, hot flushes and hypotension. HDU admission should be considered.

Discharge arrangements

Once calcium levels are stable (and provided that there are no ongoing surgical issues) the patient can be discharged home. The patient will usually require ongoing oral alfacalcidol and calcium after discharge. For haemodialysis patients, calcium levels will be checked on dialysis to allow further adjustment of therapy. For peritoneal dialysis and transplant patients the renal team will organise ongoing calcium management.

No patient should be discharged until firm arrangements are in place for blood tests and review by the renal team.

Clinical audit standards

Within 12 months of publication, we aim to audit the postoperative management of parathyroidectomy patients against these guidelines. There are no national audit guidelines and current practice is based on Level C evidence.

Summary of development and consultation process undertaken before registration and dissemination

The authors listed above drafted this guideline on behalf of the Renal Directorate who has agreed the final content. During its development it was has been circulated for comment to: all Renal consultants and Mr. S. Pain. All comments were considered and where appropriate were incorporated into the draft including the recommendations from the audit which was carried out last year.

Distribution list/ dissemination method

Intranet, appropriate surgical wards (Docking and Easton) and renal areas.

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References/ source documents

Protocols from hospitals including Cambridge, Edinburgh, Bristol and Birmingham.

K/DOQI Clinical Practice Guidelines for Bone Metabolism and Disease in Chronic Kidney Disease (USA, Level C evidence).