**Combined Calcium and Pentagastrin Stimulation Test**

**Indication:**
Screening for thyroid medullary cell carcinoma or to pick up C cell hyperplasia in MEN2 patients or their relatives.

**Contraindications:**
None

**Precautions:**
Calcium and calcitonin documented as being normal; if basal calcitonin level is already raised medullary cell carcinoma must be assumed to be present and stimulation will add little.

**Procedure:**
Preparation: 1 week before test obtain accurate weight of patient. Notify lab. Inform registrar on call and obtain prescription for Calcium & Pentagastrin. Inform pharmacist of test date, pharmacist requires to site prescription and will check dose calculation.

NB pharmacy cannot supply before 09:30 am on day of test.

Dose calculation

- **Pentagastrin:** 0.25mcg/kg body weight
- **Calcium Gluconate:** 1mg/kg body weight.

- Provide patient with copy of ‘C & P Test information letter’ when arranging appointment.
- **Fasting from midnight, except water:** no alcohol for twelve hours preceding test.
- Patient supine throughout test. Warn of common side effects (Pentagastrin - very transient flushing, nausea and abdominal cramps, Calcium - paraesthesia.)
- Site iv. cannula (Green venflon)
- **Two nurses required for twenty minutes of test.** Doctor for iv. administration and should stay in unit throughout test.
- Record BP at each sample time (use Omron with print facility). Use electronic minute minder for accurate calculation of sample collection times.
- **Order of iv. administration:** immediately after collection of 0 sample
  1 Calcium Gluconate given over 1 to 2 minutes - flush with 5 mls Sodium Chloride 0.9%.
  2 Pentagastrin given over 5 seconds - flush with 5 mls Sodium Chloride 0.9%.

- **Collection of remaining samples timed from completion of C & P administration.**

**Sampling:**

- **Calcitonin** - orange (li hep) 5.5ml.
- **PTH** - white (plain) 4ml.
- Ionised Calcium - blood gas syringe 1.5ml (use Monovette adapter, fill slowly, mix well)

- Calcitonin on ice -5 0 +2 +5 +10 +20
- Ionised calcium -5
- PTH -5

At each time point discard 0.5ml blood, collected separately in 2ml syringe, prior to sample collection. Following sample collection flush cannula with Sodium Chloride.
• Calcitonin is stable for a maximum of 20 minutes hence the need to send in batches.
• Send to lab in 4 batches with cool pack:  (-5)  (0 +2)  (+5+10)  (+20)
• Telephone lab immediately prior to sending -5 and send forms with first batch.
• **Mark each tube clearly with time of sample collection.**
• separate forms required: Regional Hormone form for Calcitonin &  PTH;  WGH -
  Ionised calcium. (see examples attached).

**Interpretation:**
Normal range : Calcitonin <15ng/l, Ionised Calcium 1.13-1.29,  PTH 10- 65ng/l
Doubling of the calcitonin level is abnormal.  A rise above 80ng/l is suggestive of C cell
hyperplasia.

Other screening investigations for MEN2 usually include:
DNA samples - take at collection of -5 sample (4 x pink EDTA 2.7ml tubes)  Genetics form.
24 hour urine collection for metanephrines - arrange at time of booking test or recording weight.
Collection returned on day of test.