**Description of Service:**

The NALHN Endocrine Service accepts referrals for a full range of Endocrine Conditions. The Main service is provided through Lyell McEwin Hospital, with a satellite service available through Modbury Hospital.

<table>
<thead>
<tr>
<th>Conditions Seen Include:</th>
<th>Exclusions:</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; Adrenal Disease/Adrenal Mass</td>
<td>&gt; Uncomplicated primary hypothyroidism</td>
</tr>
<tr>
<td>&gt; Endocrine hypertension</td>
<td>&gt; Obesity without a suspected endocrine cause or complication</td>
</tr>
<tr>
<td>&gt; Thyroid disorders – hyperthyroidism; complicated hypothyroidism; Thyroid Cancer</td>
<td></td>
</tr>
<tr>
<td>&gt; Male hypogonadism</td>
<td></td>
</tr>
<tr>
<td>&gt; Menopause</td>
<td></td>
</tr>
<tr>
<td>&gt; Osteoporosis and Metabolic Bone Disease</td>
<td></td>
</tr>
<tr>
<td>&gt; Parathyroid Disease</td>
<td></td>
</tr>
<tr>
<td>&gt; Pituitary Disorders</td>
<td></td>
</tr>
<tr>
<td>&gt; Reproductive Health &amp; Polycystic Ovary Syndrome</td>
<td></td>
</tr>
<tr>
<td>&gt; Reproductive Endocrinology (Modbury Only)</td>
<td></td>
</tr>
<tr>
<td>&gt; Other:</td>
<td></td>
</tr>
<tr>
<td>&gt; hypocalcaemia</td>
<td></td>
</tr>
<tr>
<td>&gt; hypercalcaemia of uncertain cause</td>
<td></td>
</tr>
<tr>
<td>o hypoglycaemia without known diabetes mellitus</td>
<td></td>
</tr>
<tr>
<td>o severe dyslipidaemia</td>
<td></td>
</tr>
</tbody>
</table>

**Acknowledgement:** Content for this document was primarily sourced through the SALHN Specialty Outpatient Guidelines 2014/15

<table>
<thead>
<tr>
<th>Version</th>
<th>Date from</th>
<th>Date to</th>
<th>Amendment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>July 2015</td>
<td>July 2016</td>
<td>Original</td>
</tr>
<tr>
<td>2.0</td>
<td>May 2016</td>
<td>March 2019</td>
<td>New Template</td>
</tr>
<tr>
<td>3.0</td>
<td>April 2019</td>
<td></td>
<td>New template, edited document</td>
</tr>
</tbody>
</table>
Referral Criteria:
> Please include copies of all reports and results
> Patients are seen based on the urgency, as judged from the referral, so referring doctors are urged to give a full and detailed referral to ensure that this is equitably managed.

Referral Guidelines are provided for:

> Hyperthyroidism
> Hypothyroidism
> Thyroid nodules
> Male hypogonadism
> Hyperparathyroidism
> Hypercalcaemia
> Hypocalcaemia
> Hyperprolactinaemia
> Adrenal mass
> Osteoporosis/metabolic bone disease
> Polycystic ovarian syndrome

NALHN prefers all referrals to be named to a clinician providing the service (see list below)
<table>
<thead>
<tr>
<th>URGENT</th>
<th>SEMI-URGENT</th>
<th>NON-URGENT/ROUTINE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target &lt; 1month</td>
<td>Target &lt; 3months</td>
<td>All other endocrine referrals</td>
</tr>
</tbody>
</table>

- Addisonian Crisis
- Acutely symptomatic hypocalcaemia
- Hypercalcaemia if suspected malignancy or Ca > 3mmol/L
- Myxoedema coma
- Severe symptomatic hyponatraemia or other electrolyte disturbance
- Pituitary tumour with suspected apoplexy or visual field defect
- Hyperthyroidism with acute cardiac complication eg AF or ischaemia – refer as urgent also to Cardiology
- Hyperthyroidism with hypokalaemia or paralysis

- Suspected phaeochromocytoma
- Acute hyperthyroidism
- Suspected new thyroid cancer
- Suspected insulinoma
- Suspected Addison’s disease with abnormal pre 10am serum cortisol
- Suspected Cushing’s syndrome with abnormal screening test
- Adrenal mass if size >4cm or suspected malignancy or endocrine activity
- Hypercalcaemia non-acutely symptomatic
- Pituitary tumour – symptomatic or suspected endocrine activity
- Suspected hypopituitarism
- Suspected diabetes insipidus

Acknowledgement: Content for this document was primarily sourced through the SALHN Specialty Outpatient Guidelines 2014/15
Consultants

> Dr Anthony Zimmermann (Head of Diabetes and Endocrine Services)
> Dr Elaine Pretorius
> Dr Parind Vora
> Associate Professor Peak Mann Mah
> Dr Anjana Radhakutty.
> Dr Kirsten Campbell
> Dr Linda Watson
> Dr Jessica Stranks

For More Information or to Make a Referral
Location: LMH OPD Area 1 – Ground floor
Referral Fax Number: 81829499
Phone Number: via LMH Switchboard 81829000

Or

Location: MH OPD Area 2&3 – Ground Floor MH
Referral Fax Number: 8161 2591
Phone Number: via MH Switchboard 8161 2000

HYPOTHYROIDISM – Primary or Secondary

- Primary hypothyroidism (due to thyroid disease) can generally be managed in general practice unless there are warning signs (see below).
- If hypothyroidism is suspected but TSH levels are not elevated, the possibility of secondary hypothyroidism due to pituitary or hypothalamic disease should be considered.
- Secondary hypothyroidism is uncommon and rare in the absence of other pituitary hormone deficits
  - Evaluation should involve an endocrinologist.
  - Do not start Thyroxine for secondary hypothyroidism without endocrine unit input
- Thyroid ultrasound or other thyroid imaging is not generally useful in the assessment of primary or secondary hypothyroidism

Information Required

- Presence of Red Flags
- Duration of symptoms
- Associated symptoms

Investigations Required

- TSH, free T4 and T3
- Thyroid autoantibodies if primary hypothyroidism

Red Flags

- Pregnancy – established or planned
- Hyponatraemia <125mmol/L
- Congestive heart failure or major fluid overload
- Bradycardia < 50 beats/min
- Altered conscious state
- Possibility of secondary hypothyroidism
- Hypothermia Temp < 35.5C

Suggested GP Management

- Severe hypothyroidism with altered mentation, hypothermia or hyponatraemia - discuss with on call registrar
- If pregnant or planning pregnancy, aim to keep TSH < 2.5 miU/L
- Refer urgently if suspected or confirmed secondary hypothyroidism (do not start thyroxine until hypocortisolaemia is ruled out)

Clinical Resources

- Therapeutic Guidelines Endocrinology Version 5 2014
- For additional support and guidance please refer to the RACGP clinical guidelines.
HYPERPROLACTINAEMIA

- Common causes: drugs (e.g. antipsychotic agents, antiemetics), pregnancy and breastfeeding, idiopathic and pituitary micro and macroadenomas.
- Hypothyroidism and renal failure should be excluded.
- Significant symptoms are galactorrhea and those due to gonadal steroid deficiency (menstrual disturbance, hypogonadism, infertility).

Information Required
- Presence of Red Flags
- Duration of symptoms
- Associated symptoms
- Drug therapy
- Plans re pregnancy if relevant

Investigations Required
- Serum prolactin with repeat level and measure macroprolactin if no symptoms
- TFT, renal function

Investigations NOT Required
- CT Scan of Brain/Pituitary
- MRI may be performed if needed by the endocrine unit

Red Flags
- Visual loss or other neurological signs
- Pathological headaches
- Serum prolactin >x10 upper limit of normal range

Suggested GP Management
- Check female patient is not pregnant
- Withdraw any drugs likely to elevate serum prolactin if possible
- If patient is not clearly symptomatic repeat serum prolactin and ask for macroprolactin (a variant of prolactin which is inactive) level

Clinical Resources
**HYPOCALCAEMIA**

- Corrected or ionized serum calcium should be used for accurate assessment.
- Common causes of true hypocalcaemia are
  - hypoparathyroidism, drugs (including recent rather than current use) and alcohol

### Information Required

- Presence of Red Flags
- Duration of symptoms
- Previous neck surgery
- Recent chemotherapy
- Current and previous drug use – bisphosphonates, denosumab, phenytoin
- Alcohol use
- Associated symptoms

### Investigations Required

- Serum total and ionized calcium, albumin, phosphate, Mg, renal function, ALP, PTH, 25 OH Vit D

### Red Flags

- Tetany
- Seizures
- Cramp
- Cardiac Arrhythmia
- Paraesthesiae
- Concurrent hypokalaemia
- Corrected serum calcium <1.8mmol/L or Ionised Calcium <0.9mmol/L

### Suggested GP Management

- If Red Flags present, discuss with on call registrar
- Ensure hypocalcaemia is real by using corrected or ionized serum calcium
- Check serum PTH
- 25 OH Vitamin D and magnesium replacement if deficient
- Start treatment with calcium and calcitriol if symptomatic – discuss with on call registrar if unsure

### Clinical Resources

- Therapeutic Guidelines Endocrinology Version 5 2014

Acknowledgement: Content for this document was primarily sourced through the SALHN Specialty Outpatient Guidelines 2014/15
HYPERCALCAEMIA

Common causes are
- Primary hyperparathyroidism
- Malignancy
- Drugs (Lithium, Thiazides, Calcitriol)
- Other causes are rare and generally require endocrine assessment

Information Required
- Presence of Red Flags
- Duration of symptoms
- Associated symptoms
- Past medical and family history
- Current drug therapy (and previous lithium use)

Investigations Required
- Total and corrected serum calcium – repeat fasting if borderline
- Serum PTH, PO4, ALP and 25OH vitamin D, creatinine
- Second void fasting morning spot urine for calcium and creatinine

Red Flags
- Known or suspected malignancy – if confirmed as the cause of hypercalcaemia refer to oncology or relevant surgical unit
- Nausea, vomiting, dehydration, weight loss or diminished conscious state
- Corrected serum calcium >3 mmol/L
- Rapid renal function deterioration
- Recurrent renal calculi
- Pancreatitis

Suggested GP Management
- If Red Flags present, discuss with on call registrar
- Ensure hypercalcaemia is real by using corrected serum calcium
- Stop potential exacerbating drugs (Lithium if safe to do so)
- Maintain hydration

Clinical Resources
- Therapeutic Guidelines Endocrinology Version 5 2014
**MALE HYPOGONADISM**

> This is not a diagnosis in itself and requires investigation of an underlying cause.

> Should be diagnosed only in the presence of consistent symptoms and signs and unequivocally low testosterone values

- Primary hypogonadism (low T, elevated LH and FSH) indicates primary testicular disease
- Secondary hypogonadism (low T without compensatory increase in LH and FSH) indicates pituitary or hypothalamic dysfunction.

**Information Required**
- Presence of Red Flags
- Duration of symptoms
- Associated symptoms
- Comorbidities
- Drug therapy including previous prescribed or non-prescribed androgens

**Investigations Required**
- Androgen Studies measured at 0800-0900 on at least 2 separate days
- Serum LH, FSH and Prolactin
- CBP, EUC, LFT, PSA
- Sleep Study should be considered if there are risk factors for Sleep Apnoea

**Red Flags**
- Disabling Symptoms
- Panhypopituitarism
- Headache
- Significant hyperprolactinaemia
- Visual field defects
- Osteoporosis and/or sarcopenia

**Suggested GP Management**
- Investigation should establish persistent biochemical testosterone deficiency (requires at least 2 serum testosterone levels at 0800-0900 on separate days) and then establish a cause of deficiency if present.
- If there is clear biochemical androgen deficiency (<6mmol/L), perform the recommended other preliminary biochemical tests.
- **Not all patients with hypogonadism benefit from testosterone replacement**

**Clinical Resources**
ADRENAL MASS

Adrenal masses are a common incidental finding on imaging, particularly in older individuals. The majority are benign and non-functioning (incidentalomas)

- investigation to exclude abnormal endocrine activity remains an important aspect of management.

Primary or secondary malignancies are rare causes which require exclusion.

<table>
<thead>
<tr>
<th>Information Required</th>
<th>Investigations Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presence of Red Flags</td>
<td>Depending on clinical features, test for biochemical evidence that the mass is functioning.</td>
</tr>
<tr>
<td>Co-morbidities</td>
<td>EUC and plasma aldosterone/renin ratio if hypertension is present to screen for primary hyperaldosteronism</td>
</tr>
<tr>
<td>Current medications</td>
<td>1mg overnight dexamethasone suppression test, late night salivary cortisol measurement, or 24hour urine free cortisol to screen for Cushing’s syndrome</td>
</tr>
<tr>
<td></td>
<td>Plasma or 24 hour urine metanephrines (replaces catecholamine determination) to screen for Phaeochromocytoma</td>
</tr>
<tr>
<td></td>
<td>Current and previous CT or other imaging</td>
</tr>
<tr>
<td></td>
<td>Specialised adrenal imaging with MRI or nuclear scan</td>
</tr>
</tbody>
</table>

Red Flags

- Symptoms of mass effect (rare)
- Clinical or Radiological features suggestive of malignancy or phaeochromocytoma
- Severe hypertension or hypokalaemia

Suggested GP Management

Refer Urgently to Endocrine clinic if:

- there are features on imaging suggestive of adrenocortical carcinoma (e.g. size greater than 4 cm, irregular borders, as reported by radiology)
- there is evidence (clinical or biochemical) that the mass is functional

If none of the above features are present a non-urgent referral is appropriate.

Clinical Resources

- European Society of Endocrinology Clinical Practice Guidelines: Management of adrenal incidentalomas
  
THYROID NODULES

- 3 to 7% of adult patients have a thyroid nodule palpable on examination.
- Nodules can be detected with ultrasound in 30-70% of adults, and this increases with age.
- The vast majority of these nodules are not malignant and do not necessarily require any further investigation.
- Many older patients will have foci of thyroid cancer which never cause any clinical problem.
- Use of ultrasound for non-specific symptoms or screening purposes is not cost-effective as it may stimulate further unnecessary concern and tests.

Information Required

- Presence of Red Flags
- Presence of clinical or radiological features associated with increased risk of malignancy of thyroid nodule
- Thyroid function
- Previous irradiation if known

Investigations Required

- Thyroid function tests (TSH and free T4)
- Previous imaging or cytology

Red Flags

- Stridor associated with a thyroid mass - refer urgently to emergency department
- Thyroid mass associated with palpable cervical lymphadenopathy or voice change - refer semi-urgently to Breast Endocrine Surgical clinic

Suggested GP Management

- For patients with a thyroid nodule and abnormal thyroid function test, refer to Endocrine clinic
- For patients with a euthyroid thyroid nodule, refer to Breast Endocrine Surgical clinic

Thyroid nodules may not require further investigation if:

- Thyroid function is normal and no local symptoms and likelihood of thyroid cancer is low
- Age, comorbidities or other patient characteristics make diagnosis of thyroid cancer irrelevant.

If a Nodule is detected on ultrasound,

- the report should include characterization of the nodule including size, calcification and vascularity; features suspicious for malignancy
- if this is not stated in the report send it back and have it properly reported.

Nodules with a benign appearance do not usually require FNA unless:

- the individual has a statistically high risk of malignancy (e.g. previous neck irradiation).

Clinical Resources

- American Thyroid Association Guidelines for the Management of Thyroid Nodules and Differentiated Thyroid Cancer 2015 https://www.liebertpub.com/doi/pdf/10.1089/thy.2015.0020
- For additional support and guidance please refer to the RACGP clinical guidelines.
HYPERPARATHYROIDISM

- Primary hyperparathyroidism generally involves some degree of hypercalcaemia with an inappropriately high PTH level (not necessarily above the normal lab range) indicating autonomous PTH production. Primary hyperparathyroidism is a clinical and biochemical diagnosis – it is not aided by currently available parathyroid imaging.
- Secondary PTH elevation is most commonly due to vitamin D deficiency, hypocalcaemia or renal failure and involves a normal response of the parathyroid glands to a physiological stimulus - it does not indicate any abnormality in the parathyroid glands themselves.

Information Required
- Presence of Red Flags
- Duration of symptoms
- Associated symptoms
- Past medical and family history
- Current drug therapy (and previous lithium use)

Investigations Required
- Total and corrected serum calcium – repeat fasting if borderline
- Serum PTH, PO4, ALP and 25OH vitamin D, creatinine
- Second void fasting morning spot urine for calcium and creatinine
- DEXA if minimal trauma fracture or loss of height

Investigations NOT Required
- Parathyroid imaging (US, nuclear scanning, CT) should not be performed – these tests are insensitive, do not aid diagnosis and are only useful in guiding the type of surgery once a decision has been made to operate

Red Flags
- Nausea, vomiting, dehydration, weight loss or diminished conscious state
- Corrected serum calcium >3 mmol/L
- Recurrent renal calculi
- Rapid renal function deterioration
- Pancreatitis

Suggested GP Management
- Ensure hypercalcaemia is real by using corrected serum calcium
- Stop potential exacerbating drugs (e.g. thiazides, calcitriol, lithium if safe to do so)
- Maintain hydration
- Continue a normal dietary calcium intake
- Correction of low vitamin D stores using a vitamin D3 preparation

Clinical Resources
- Therapeutic Guidelines Endocrinology Version 5 2014
OSTEOPOROSIS / METABOLIC BONE DISEASE

- Idiopathic osteoporosis
- Corticosteroid bone disease
- Osteomalacia
- Paget’s disease
- Osteogenesis Imperfecta
- Other metabolic bone diseases – generally renal bone disease is managed by the renal unit

<table>
<thead>
<tr>
<th>Information Required</th>
<th>Investigations Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presence of Red Flags</td>
<td>EUC, Ca, ALP, LFT</td>
</tr>
<tr>
<td>Duration of symptoms</td>
<td>25 OH vit D</td>
</tr>
<tr>
<td>Associated symptoms</td>
<td>TFT</td>
</tr>
<tr>
<td>Co-morbidities</td>
<td>DEXA</td>
</tr>
<tr>
<td>Previous fractures, particularly if low impact</td>
<td>Relevant plain X-rays</td>
</tr>
<tr>
<td>Drug therapy including current and prior glucocorticoids, HRT and osteoporosis therapy</td>
<td>Serum testosterone 0800-0900h in males</td>
</tr>
<tr>
<td></td>
<td>Fasting Serum crosslaps</td>
</tr>
<tr>
<td></td>
<td>Coeliac Screen</td>
</tr>
<tr>
<td></td>
<td>Serum electrophoresis</td>
</tr>
</tbody>
</table>

Red Flags
- Frequent fractures especially on therapy
- Suspicion of underlying malignancy
- Hypercalcaemia (serum Ca corrected >2.8 mmol/L)
- Z score < -2.0
- Severe bone pain or progressive deformity

Suggested GP Management
- Refer urgently or speak to on call registrar if Red Flags present – otherwise referral is generally non-urgent
- Optimize calcium and vitamin D status
- Use a fracture risk calculator (FRAX or Garvan) to help guide the need for specific drug therapy
- If Z score is < -2.0 investigation for secondary cause of osteoporosis is indicated

Clinical Resources
- Fracture Risk Assessment Tool (FRAX) [http://www.shef.ac.uk/FRAX/tool.jsp?locationValue=9](http://www.shef.ac.uk/FRAX/tool.jsp?locationValue=9)
- For additional support and guidance please refer to the [RACGP](http://www.racgp.org.au) clinical guidelines.
HYPERTHYROIDISM

- Management depends on the underlying cause
- Common causes:
  - Graves’ disease, toxic adenoma or multi-nodular goitre, subacute, silent or post-partum thyroiditis, excessive thyroid hormone administration and iodine induced (often from radiological contrast media or Amiodarone).

<table>
<thead>
<tr>
<th>Information Required</th>
<th>Investigations Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presence of Red Flags</td>
<td>TFTs</td>
</tr>
<tr>
<td>Duration of symptoms</td>
<td>Thyroid TSH receptor antibodies if suspicious of Graves’ disease</td>
</tr>
<tr>
<td>Associated symptoms</td>
<td>Nuclear thyroid scan</td>
</tr>
<tr>
<td>Current and previous drug use (e.g. amiodarone, lithium)</td>
<td>Investigations NOT Required</td>
</tr>
<tr>
<td>Recent potential iodine source (e.g. contrast media)</td>
<td>Thyroid ultrasound is not usually helpful</td>
</tr>
<tr>
<td>Concomitant medical problems and family history</td>
<td></td>
</tr>
</tbody>
</table>

Red Flags
- Atrial fibrillation or other cardiac rhythm disturbance
- Hypokalaemia or periodic paralysis, particularly in South East Asian origin patients
- Rapid weight loss, significant myopathy
- Obstructive symptoms from a goiter
- Severe or progressive thyroid eye disease
- Cardiac failure or ischaemia
- Pregnancy (current or intended) or breastfeeding

Suggested GP Management
- If Red Flags present discuss with on call registrar.
- Nuclear thyroid scan and serum TSH receptor antibodies if cause unclear.
- Avoid iodinated contrast agents wherever possible.
- Consider B Blocker for symptom control.
- If hyperthyroidism is not due to excess exogenous thyroid hormone, transient thyroiditis or iodine load start carbimazole (or PTU if pregnancy possible) e.g. If age < 50 years 10mg twice daily; age > 50 years 5mg twice daily. Note that serious adverse reactions to these drugs are not uncommon (rash, jaundice, neutropenia) and patients must be fully informed.
- Repeat TFTs a week prior to clinic appointment

Clinical Resources
- Therapeutic Guidelines Endocrinology Version 5 2014
- For additional support and guidance please refer to the RACGP clinical guidelines.
POLYCYSTIC OVARY DISEASE (PCOS)

Polycystic ovary syndrome (PCOS) is a common condition, present in 12–21% of women of reproductive age.

A diagnosis of polycystic ovary syndrome can be made if 2 of the 3 following criteria are met:
- Androgen excess (clinical or biochemical)
- Ovulatory dysfunction
- Polycystic ovaries (PCO)

Other disorders that mimic the clinical features of PCOS must be excluded.

Information Required
- Presence of Red Flags
- Duration of symptoms
- Associated symptoms
- Family history

Investigations Required
- Androgen studies
- TFT, Prolactin
- OGTT or HbA1c
- Sleep study if clinical suspicion of OSA

Red Flags
- Virilisation (not typical of PCOS and should prompt consideration for investigation of other causes of hyperandrogenism)
- Abnormal glucose metabolism
- Obstructive sleep apnoea
- Non-alcoholic fatty liver disease
- Cardiovascular disease
- Endometrial carcinoma

Suggested GP Management
- Treatment of current symptoms, preventive advice, and management and monitoring for future complications are all important aspects of care.
- Pharmacological treatment will be influenced by the major presenting feature and whether fertility is a patient priority.

Clinical Resources
- Endocrine Society Clinical Guidelines: Diagnosis and Treatment of Polycystic Ovary Syndrome (2013)
- For additional support and guidance please refer to the RACGP clinical guidelines.