Women's & Children's Hospital

Endocrinology and Diabetes Referral Guidelines

Contents

Summary of Service

The WCHN Endocrine and Diabetes service provides care to children with all forms of diabetes, growth, thyroid, pituitary, adrenal, pubertal and bone disorders.

For Clinical Advice:
Phone (08) 8161 7000 and ask for the Paediatric Endocrine Registrar during working hours, or the On call Consultant for Endocrinology after hours

All referrals should be faxed to the Administration Hub on 8161 6246.

Referral Form Download: OPD referral form

Mandatory referral content

Demographic

- Childs name
- Date of birth **(please consider referring patients over the age of 17 years to an adult facility)**
- Family contact details including mobile and email if available
- Referrer details including mobile and email if available
- Interpreter requirements

Clinical

- Reason for referral
- Clinical urgency
- Management to date
- Relevant pathology/imaging
- Past medical history
- Medications
- Family history

***refer to individual guidelines for more specific information ***

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Priority

Priority will be based upon the information provided in this referral. All referrals to the Endocrine service will be assessed and triaged by a Consultant Endocrinologist who will allocate a clinical priority category as appropriate.

Emergency: Proceed to the emergency department

Priority 1: We aim to see these patients as soon as possible

Priority 2: Next available appointment

Priority 3: Within 12 months

To help us best triage your referral, it may be returned for further investigations if the following process has not been adhered to.

Please note this is a guideline for referral only. If concerned about a patient please contact the Endocrine Registrar via switchboard on 8161 7000.

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1. Diabetes

Type 1 diabetes can present at any age, but is very rare in children ≤ 6 months. The diagnosis always requires urgent discussion with the WCH Diabetes team or evaluation in ED WCH on the day of diagnosis, as even an apparently well child can deteriorate quickly. There is no need to wait for a fasting BGL if a random BGL is elevated.

Type 2 diabetes usually presents in children > 8 years with a family history of type 2 diabetes. It is associated with overweight, acanthosis nigricans and high risk ethnicities (Aboriginal, Asian, Indian, Hispanic).

Children may have stress hyperglycaemia in conjunction with an intercurrent infection and fever. This always requires assessment to exclude early type 1 diabetes.

Our service can evaluate children at risk of type 1 and 2 diabetes on the basis of family history and we are the SA Centre for all preclinical intervention trials and studies in childhood and adolescent type 1 diabetes. This includes the ENDIA study following at risk children from pregnancy www.endia.org.au. We are also the SA Centre for diabetes technology trials and national and national and international trials to prevent vascular complications in children and adolescents.

Initial pre-referral work up	GP management	Comments
Clinical History • Hyperglycaemia: polyuria, polydipsia, weight loss, fatigue • DKA: vomiting, abdominal pain, difficulty breathing, lethargy, decreased consciousness **Examination** • Ht, Wt, BP, pulse • Respiratory rate (Kussmaul breathing) • Hydration • Conscious state/GCS **Investigations** • Random blood glucose level (fasting glucose not required) • Blood or urine ketones **For additional medical/patient resources:**		**Emergency**: • If child unwell, vomiting (suggests rising ketones), or decreased conscious state for assessment of DKA **Urgent:** • If child looks well, refer to ED on the day of detection of raised blood glucose for assessment **Semi Urgent/Routine**

2. Short Stature

Evaluation of short stature is recommended if height is below the 1st percentile, height percentiles are falling, height is inconsistent with mid-parental height, or body proportions are abnormal.

Initial pre-referral work up	GP management	Comments
Clinical History • Previous growth parameters • Previous medical history • Age of onset of puberty • Family history: Parents' heights and pubertal timing **Examination** • Ht, Wt, Tanner staging • Dysmorphic features **Investigations to consider** • Hormone deficiency: IGF1, TSH, FT4 • Chronic disease: CBP, EUC, LFT, ESR, CRP, coeliac antibodies, urinalysis • Chromosomal abnormalities: karyotype, SHOX gene • Bone age xray with estimated final height **For additional medical/patient resources:**		**Emergency**: **Urgent:** **Semi Urgent/Routine:**

3. Early Puberty

The onset of puberty usually occurs between 8 and 13 years in girls and between 9 and 14 years in boys. Girls reach menarche 2-3 years after the onset of puberty. Full pubertal development occurs over 4-5 years.

Early puberty is defined as breast or pubic hair development before the age of 8yrs in girls and testicular enlargement (testes >4ml in volume) and pubic hair before the age of 9yrs in boys. It is often associated with a rapid tempo of pubertal progression and increased height velocity.

Initial pre-referral work up	GP management	Comments
Clinical History • Age of onset of breast development • Age of onset of pubic hair development • Age of menarche • Family history: Parents' heights and pubertal timing **Examination** • Ht, Wt, Tanner staging **Investigations to consider** • If breast development: LH, FSH, Oestradiol • If increase in testicular size: LH, FSH, testosterone • If increase in pubic hair: early morning 17OHP, DHEAS, testosterone • Bone age xray **For additional medical/patient resources:**		**Emergency**: **Urgent:** Pubertal onset before the age of 8 years in girls, 9 years in boys **Semi Urgent/Routine**

4. Delayed Puberty

The onset of puberty usually occurs between 8 and 13 years in girls and between 9 and 14 years in boys. Girls reach menarche 2-3 years after the onset of puberty. Full pubertal development occurs over 4-5years.

Delayed puberty is defined as no breast development by age 13yrs or no menstrual periods by age 16 years in girls and no testicular enlargement (testes <4mls in volume) by age 14 years in boys.

Initial pre-referral work up	GP management	Comments
Clinical History • Is puberty absent or stalled? • Family history: Parents' heights and pubertal timing • Medical conditions or treatments causing delayed growth and puberty • History of pituitary or gonadal problems **Examination** • Ht, Wt, Tanner staging **Investigations to consider** • LH, FSH and testosterone (boys) or oestradiol (girls) to exclude gonadal failure • Bone Age **For additional medical/patient resources:**		**Emergency**: **Urgent:** **Semi Urgent/Routine**

5. Thyroid disease

Thyroid problems in children may present as hypothyroidism, hyperthyroidism or a thyroid nodule. Commonly thyroid function testing reveals a normal FT4 and a mildly elevated TSH <10IU/L. This may be of no clinical significance or may represent developing hypothyroidism or mild iodine deficiency. Thyroid function tests should be repeated in 3 months with thyroid autoantibodies (TPO) before referral.

A thyroid ultrasound does not need to be ordered unless a thyroid nodule is palpated. Thyroid nodules with normal TFTs should be referred to a Thyroid Surgeon.

Initial pre-referral work up	GP management	Comments
Clinical History • Symptoms of hypo or hyper thyroidism • Family history of thyroid disease • Dietary iodine intake **Examination** • Ht, Wt and assessment of growth • Palpation of thyroid for enlargement, thyroid nodule or cervical lymphadenopathy • Assessment for signs of hypo or hyper-thyroidism **Investigations to consider** • Hypothyroidism: TSH, FT4 and thyroid autoantibodies (TPO). Thyroid ultrasound not required • Hyperthyroidism: TSH, FT4, FT3 and TSH receptor and TPO antibodies, CBP and LFTs. Thyroid ultrasound not required • Thyroid Nodule: TSH, FT4 and thyroid autoantibodies (TPO). Thyroid ultrasound **For additional medical/patient resources:**		**Emergency**: **Urgent:** **Semi Urgent/Routine**

6. Osteoporosis

Osteoporosis in childhood may present with frequent low trauma fractures, bone pain, or 'osteopenia' on plain xray. The most common cause is Osteogenesis Imperfecta (OI), followed by secondary osteoporoses associated with malnutrition, immobilisation (eg CP or DMD), vitamin D deficiency, chronic inflammation (eg CF, arthritis, IBD), or medications (eg, glucocorticoids, anti-convulsants). Treatment includes optimising dietary calcium, ensuring adequate vitamin D levels, and improving mobilisation where possible. In severe cases, a bone density scan may be helpful in determining whether treatment with a bisphosphonate will be of benefit.

Initial pre-referral work up	GP management	Comments
Clinical History • Fracture history – number of fractures and mechanism of injury • Dietary calcium intake • Sun exposure • Onset of puberty • Bone pain • Ability to mobilise • Family history of osteogenesis imperfecta **Examination** • Physical features of OI (see www.oif.org) • Bone deformity **Investigations** • Labs: 25OHD, calcium, magnesium, phosphate, ALP, PTH • Consider bone density scan at a Paediatric centre (total body and lumbar spine, adjusted for height) **For additional medical/patient resources:**	• Optimise dietary calcium and vitamin D levels • For replacement doses see SA Health Paediatric Clinical Practice Guidelines – Vitamin D Deficiency	**Emergency**: **Urgent:** **Semi Urgent/Routine**

7. Rickets

The most common cause of rickets is nutritional, ie vitamin D deficiency and/low calcium intake, and mild cases can be managed in a GP clinic following recommended guidelines (SA Health Paediatric Clinical Practice Guidelines – Vitamin D Deficiency).

Referral to WCH is recommended if:

- Significant bowing of limbs / other nutritional deficiencies – refer to General Paediatric clinic
- Secondary fractures / hypocalcaemia / not responsive to vitamin D replacement - refer to Endocrine clinic
- Hypophosphataemic rickets - refer to Renal clinic

Simple vitamin D deficiency can be managed in the community by supplementing with oral cholecalciferol to achieve 25OHD level > 50nmol/L and ensuring adequate dietary calcium. These children do not need to be referred to WCH.

Initial pre-referral work up	GP management	Comments
Clinical History • Onset of bowed legs/swollen wrists • Bone pain • Fractures • Sun-exposure • Dietary calcium intake • Maternal vitamin D status if child is less than 12 months **Examination** • Bowed legs • Swollen wrists • Rachitic rosary • Frontal bossing **Investigations** • 25OHD, Ca, Mg, PO4, ALP, PTH • Consider Xray of wrists/knees/chest **For additional medical/patient resources:** • SA Health Paediatric Clinical Practice Guidelines – Vitamin D Deficiency	• For replacement doses see SA Health Paediatric Clinical Practice Guidelines – Vitamin D Deficiency	**Emergency**: **Urgent:** **Semi Urgent/Routine**

8. Obesity

Definition:
Children ≥2 years of age with a BMI > 95th centile for age and gender
Children <2 years with weight for length > 97th centile (WHO chart)

Referral to assess for a pathological conditions should be considered if:

- Obesity onset < 5 years of age
- Obesity associated with hyperphagia and/or dysmorphic features
- History of developmental delay
- Height < 1st centile or falling height percentiles

Referral should be considered if:

- Patient has failed initial GP management outlined below
- Significant risk of type 2 diabetes
- Comorbidities: OSA to Respiratory Medicine, abnormal LFTs to Gastroenterology, Hypertension to Renal.
- Concerns of PCOS: see PCOS referral guidelines

Initial pre-referral work up	GP management	Comments
Clinical History • Age of onset of obesity • Developmental delay • Previous growth parameters • Diet & activity history • Complications of obesity: sleep apnoea, type 2 diabetes, joint pain, liver dysfunction • Menstrual history, acne and hirsutism in girls (PCOS) • Family history: obesity, bariatric surgery, cardiovascular disease, diabetes **Examination** • Ht, Wt, BMI, BP • Dysmorphic features • Acanthosis nigricans **Investigations** • Obesity complications: LFT, lipids, fasting insulin, glucose • PCOS: LH, FSH, androgens **For additional medical/patient resources:**	Counselling on diet, exercise and reducing screen time Consideration of health care plan to access dietitian / exercise physiologist / psychologist Consider commencing metformin if child ≥ 10 years Metformin Patient Information Sheet	**Emergency**: **Urgent:** **Semi Urgent/Routine**

9. Polycystic ovarian syndrome

A diagnosis of polycystic ovary syndrome (PCOS) can be considered in adolescents who are > 2 years post menarche and requires the following:

- Irregular menstrual cycles (shorter than 21 days or longer than 45 days)
- Clinical or biochemical evidence of hyperandrogenemia: severe acne, hirsutism, high androgen levels.

Pelvic ultrasound is not required as it is not helpful in the diagnosis of PCOS in adolescence.

Initial pre-referral work up	GP management	Comments
Clinical History • Onset of menarche • Menstrual history • Acne • Hirsutism • Diet & physical activity history • Family history of PCOS **Examination** • Ht, Wt, BMI • Acne • Hirsutism **Investigations** • (Blood samples should be collected before starting OCP and ideally early in the morning) • LH, FSH, oestradiol and progesterone • Testosterone, FAI, SHBG • 17 OH progesterone • DHEAS • TSH, prolactin • bHCG (if main symptom is primary or secondary amenorrhoea) **For additional medical/patient resources:**	• Do NOT start OCP until investigations are performed • Start a menstrual calendar • Consider Health Care Plan for dietitian / exercise physiologist if obese	**Emergency**: **Urgent:** **Semi Urgent/Routine**

10. Adrenal / Parathyroid / Pituitary

Examples of common conditions seen are:

Adrenal: Addison's disease, Congenital Adrenal Hyperplasia, Phaeochromocytoma

Parathyroid: Hyperparathyroidism, Hypoparathyroidism, Parathyroid adenomas

Pituitary: Congenital & acquired pituitary disorders, Diabetes Insipidus

Initial pre-referral work up	GP management	Comments
Clinical History **Investigations** **For additional medical/patient resources:**		**Emergency**: **Urgent:** **Semi Urgent/Routine**