National Policy ☐ National Procedure ☐ National Protocol ☐ National Guideline ☐
National Clinical Guideline ☑

HSE National Clinical Guideline
Annual review and co-morbidity screening in Paediatric Type 1 Diabetes

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Lead responsibility for national monitoring and audit:	National Clinical Programme for Paediatric Diabetes
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Additional headings can be inserted as required	

DOCUMENT MANAGEMENT [2]			
Date effective from:		28/06/2024	
Date set for next review:		28/06/2027	
Your Reference No: *(if applicable)*		CDI/0098/2.0/2024	
Current version no:	2	**Archived version no:**	1
Note: Original document is Version 0. First revision is Version 1. Second revision is Version 2, and so on.			
Note: HSE National 3PGs should be formally reviewed every 3 years, unless new legislative/regulatory or emerging issues/research/technology/audit etc. dictates sooner.			

[1] Records the senior management roles involved in the governance and development of the document.
[2] Records the control information about the document.

VERSION CONTROL UPDATE [3]		
Version No. (most recent version first)	**Date reviewed** (most recent date first)	**Comments** (1 sentence max, if required)
V2	June 2024	Edits applied to all sections.
V1	Published Oct 2020	(Original document) Unique identifier – Ref: NCD19-036-001
Document management notes:		

PUBLICATION INFORMATION [4]
Topic:
Annual review and co-morbidity screening in Paediatric Type 1 Diabetes
National Group:
National Clinical Programme for Paediatric Diabetes
Short summary:
The aim of this guideline is to provide clear and standardised guidelines for all staff caring for paediatric patients with type 1 diabetes in order to detect co-morbidities (e.g. thyroid dysfunction, coeliac disease and dyslipidaemia) or complications and to improve their management.
Description:
Children with a diagnosis of diabetes require intervention, treatment and follow up care from a specialist paediatric team with expertise in managing their condition. Annual review provides an opportunity for the clinician along with the child or young person to review all aspects of their diabetes care including planning for transition to adult services pathway when age appropriate (16-18 years). A standardised approach should be employed to look for early signs of co-morbidities including coeliac disease, dyslipidaemia and thyroid dysfunction as well as complication

[3] Records details when a document is reviewed, even if no changes are made.

[4] Records the document information required for publication on the HSE National Central Repository.

NATIONAL CLINICAL GUIDELINE

Annual review and co-morbidity screening in Paediatric Type 1 Diabetes

Clinical Design and Innovation Health Service Executive

Version 2

Developed by:	National Clinical Programme for Paediatric Diabetes	Publication date:	October 2020
Document Reference Number:	CDI/0098/2.0/2024	Revised and Updated (V2):	May 2024

Contents

Aim of Guideline

The aim of this guideline is to provide clear and standardised guidelines for all staff caring for paediatric patients with type 1 diabetes in order to detect co-morbidities (e.g. thyroid dysfunction, coeliac disease and dyslipidaemia) or complications and to improve their management.

Purpose and Scope

- The purpose of this guideline is to improve the management of paediatric patients with Type 1 diabetes
- These guidelines are intended for healthcare professionals, particularly those in training, who are working in HSE-funded paediatric and neonatal services.
- They are designed to guide clinical judgement but not replace it. In individual cases a healthcare professional may, after careful consideration, decide not to follow a guideline if it is deemed to be in the best interests of the child

Background and Introduction

Children with a diagnosis of diabetes require intervention, treatment and follow up care from a specialist paediatric team with expertise in managing their condition. Annual review provides an opportunity for the clinician along with the child or young person to review all aspects of their diabetes care including planning for transition to adult services pathway when age appropriate (16-18 years). A standardised approach should be employed to look for early signs of co-morbidities including coeliac disease, dyslipidaemia and thyroid dysfunction as well as complications.

Legislation/other related policies

Model of Care for All Children and Young People with Type 1 Diabetes
http://www.hse.ie/eng/about/Who/clinical/natclinprog/paediatricsandneonatology/paedsmoc.pdf

Glossary of Terms and Definitions

T1D	Type 1 diabetes
IgA	Immunoglobulin A
Lipoatrophy	Localised loss of fat tissue at the site of insulin injections
Lipohypertrophy	Lump under the skin at the site of insulin injections that may result in abnormal insulin action
Microalbuminuria	Earliest sign of diabetic nephropathy. Screening should take place at age 11 or onset of puberty, whichever is earlier, with diabetes duration between 2-5 years (ISPAD 2022)
Nephropathy	Microvascular complication of the kidney. **Screen by:** **1.** First morning urine samples for albumin/creatinine ratio (ACR) **or** 2. Timed urine collections for albumin excretion rates (AER). Due to the risk of biological variability at least 2 of 3 consecutive collections over 3-6 months should be positive as evidence of microalbuminuria**.** If an abnormal result is found then this should be repeated as microalbuminuria may not be persistent. Screening should be avoided during periods of intensive exercise, menstrual bleeding, infections, pyrexia and marked hyperglycaemia as these may confound the results. Where patients have persistent microalbuminuria, angiotensin converting enzyme (ACE) inhibitors or angiotensin receptor blockers (ARBs) should be considered (to prevent progression to proteinuria) in consultation with paediatric nephrology services. These drugs are potentially teratogenic and this needs to be carefully considered if prescribing to adolescent girls.
Retinopathy	Microvascular complication of T1D. Screening should begin at age 11 years or at onset of puberty, whichever is earlier, with diabetes duration between 2-5 years (ISPAD 2022). Diabetic RetinaScreen is available for all with T1D in Ireland from age 12 years and screening is performed annually from then.
Neuropathy	Microvascular complication of T1D. Screening should begin at age 11 years or at onset of puberty, whichever is earlier, with diabetes duration between 2-5 years (ISPAD 2022) Screen by comprehensive foot exam checking sensation, vibration and ankle jerks annually. Autonomic neuropathy refers to damage to the nerves involved in involuntary body functions and can affect BP, HR, bowel, bladder and sexual function and should be considered if suggestive symptoms or signs. Screening, if indicated involves assessment of orthostasis and heart rate variability.

Hypothyroidism (HT)	Autoimmune hypothyroidism is more common in patients with T1D. ✓ Screen for risk of HT by checking anti-TPO and anti-thyroglobulin antibodies at diagnosis of T1D. ✓ Screen for by measurement of thyroid function tests (TSH and FT4) at diagnosis and thereafter, every second year in asymptomatic individuals without goitre or in the absence of thyroid autoantibodies at diagnosis. ✓ Screen should be undertaken annually if there are symptoms or signs of thyroid disease, positive autoantibodies at diagnosis or first degree relatives with autoimmune thyroid disease.
Coeliac disease (CD)	Occurs in 1.6-16 % of children with T1D. Screening should be performed at time of T1D diagnosis. The screening tests used should include anti-tissue transglutaminase (tTG-A) and endomysial antibodies (EMA). IgA deficiency (more common in patients with CD and T1D) should be excluded at diagnosis of diabetes, as screening for CD in cases of IgA deficiency will require IgG specific antibody tests (tTG IgG or EM IgG). All IgA deficient individuals with T1D who are positive for IgG-based serological tests should be referred to a paediatric gastroenterologist for consideration of biopsy. Screening for CD should then be carried out every 2- 5 years. More frequent screening is indicated if there are clinical suspicions of CD or a first degree relative with CD. ➢ **If tTG-A is positive, EMA should be checked.** For **symptomatic or asymptomatic children** with tTG-A levels > 10 times ULN and positive EMA antibodies, a biopsy-sparing approach can be considered in discussion with the family. Children should start a GF diet. Referral to GI services is advised if symptoms persist despite a GF diet. If tTG-A levels > 10 times ULN and negative EMA antibodies, should be referred to GI services for small bowel biopsy. **Symptomatic and asymptomatic children** with both positive tTG- A screen (> 2 times ULN) and positive EMA, refer for biopsy **Asymptomatic children** with positive tTG-A screen <2 times ULN should have repeat serology every 6 months. Once >2 times ULN or symptomatic, refer for biopsy. Children diagnosed with CD should receive education from a paediatric dietician. A GF diet should be commenced to optimise growth, bone health, prevent anaemia and may also improve glycaemic control and reduce the risk of microalbuminuria. All first degree relatives should be advised to undergo screening for coeliac disease with their family doctor, even if asymptomatic. All children with coeliac disease should have annual FBC, ferritin, B12/Folate, Vitamin D levels and thyroid function. Vit D deficiency can be associated with CD; consider supplementation if level suboptimal (< 50 nmol/L).

Hyperlipidaemia	Testing for dyslipidaemia should be performed when metabolically stable after diagnosis from age 11 years. If screen is normal, it should be repeated every 3 years. Children with a family history of hypercholesterolaemia or early cardiovascular disease should be tested earlier. Testing ideally should be with fasting lipids but this may be impractical with diabetes. Testing can be undertaken with a random sample and if LDL or triglycerides are elevated, a fasting sample is then indicated. LDL is elevated if >2.6 mmol/L; first-line management includes interventions to improve metabolic control, dietary interventions and exercise promotion. If these interventions do not reduce LDL cholesterol to < 3.4 mmol/L statins should be considered in children from age 11years after careful consideration and counselling on side effect profile

Roles and Responsibilities

This guideline should be reviewed by each acute hospital senior management team to appropriately plan implementation. This facilitates best practice and standardises the care provided to children in Ireland. This will ensure that the inpatient care of children/neonates admitted to their facility is optimised irrespective of location.

Clinical Guideline

I. At diagnosis of T1DM

It is recommended that all children newly diagnosed with T1DM should have screening for hypothyroidism, future risk of hypothyroidism, coeliac disease and IgA deficiency, TFTs, TPO and thyroglobulin antibodies IgA, tTG and EMA

II. Annual Review in prepubertal children aged < 11 years with any diabetes duration

Physical Exam: should include measurement of height, weight, BP, injection sites, pump or sensor sites and pubertal status (if relevant)

Every 2 years following diagnosis*:

Testing for Thyroid Dysfunction: TFTs
Testing for Coeliac Disease: TTG (when IgA deficiency is out ruled)

III. Annual review in children aged 11 years or pubertal with diabetes > 2 years

Physical Exam: should include measurement of height, weight, BP, injections sites, pump or sensor sites, pubertal status and foot examination (sensation, vibration and ankle jerks)

Retinopathy screening: Children aged 11 years with diabetes duration greater than 2 years, may be referred to local paediatric ophthalmology services for retinopathy screening pending eligibility for Diabetic RetinaScreen. From age 12 (see below) retinopathy screening will be undertaken by the national screening programme (www.diabeticretinascreen.ie).

Patients may be referred or may self- refer. For further information see www.diabeticretinascreen.ie or free phone *1800454555*

Microalbuminuria screening: First morning urine samples for albumin/ creatinine ratio (ACR) on two consecutive days

Every 2 years:

Testing for Thyroid Dysfunction *: TFTs

Testing for Coeliac Disease *: TTG (when IgA deficiency is out-ruled)

* unless symptomatic in which case screen when symptoms noted

Every 3 years:

Testing for Dyslipidaemia: Random sample is acceptable but if LDL > 2.6 or triglycerides are elevated, a fasting sample is indicated

Implementation, Revision and Audit

- Implementation will be via the Regional Executive Officer (REO) of each Regional Health Area (RHA) and senior management team of each acute hospital
- Distribution to other interested parties and professional bodies
- The guideline development group has agreed that this guideline will be reviewed on a 3 yearly basis
- Regular audit of implementation and impact of this guideline through outcome and process measures is recommended to support continuous quality improvement. The audit process should be coordinated in each paediatric unit under local paediatric clinical governance and should be taken from a multidisciplinary perspective where appropriate

References

1. ESPGHAN Guidelines for Diagnosing Coeliac Disease 2020. J Pediatr Gastroenterol Nutr. 2020 Jan; 70(1):141-156.

2. ESPGHAN position paper on management and follow up of children and adolescents with coeliac disease. J Pediatr Gastroenterol Nutr. 2022 Sep 1;75(3):369-386.

3. International Society for Paediatric and Adolescent Diabetes (2022) ***ISPAD Clinical Practice Consensus Guidelines 2022*** https://www.ispad.org/page/ISPADGuidelines2022

4. Guideline for the Diagnosis of Paediatric Coeliac Disease (2024) National Center for Paediatric Gastroenterology Hepatology and Nutrition CHI Crumlin in collaboration with National Clinical Programme for Paediatrics and Neonatology. https://www.hse.ie/eng/about/who/cspd/ncps/paediatrics-neonatology/resources/paediatric-algorithms/

Qualifying Statement

- These guidelines have been prepared to promote and facilitate standardisation and consistency of practice.
- Clinical material offered in this guideline does not replace or remove clinical judgement or the professional care and duty necessary for each child.
- Clinical care carried out in accordance with this guideline should be provided within the context of locally available resources and expertise.
- This Guideline does not address all elements of standard practice and assumes that individual clinicians are responsible for:
    - ✓ Discussing care with the child, parents/guardians and in an environment that is appropriate and which enables respectful confidential discussion
    - ✓ Advising children, parents/guardians of their choices and ensure informed consent is obtained
    - ✓ Meeting all legislative requirements and maintaining standards of professional conduct

Appendices

Appendix 1: Acknowledgements

This guideline (version 2) has been reviewed and updated by the National Clinical Programme for Paediatric Diabetes Working Group. The Working Group also wish to thank all those who provided input and feedback to the review and update of this guideline and to those who provided valuable input during the consultation process. We are particularly grateful to the team at the National Centre for Paediatric Gastroenterology for their input and advice of coeliac screening in Type 1 diabetes.

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Appendix 2: Guideline Approval Process

Sign off by National Clinical Programme for Paediatric Diabetes Working Group	July 2020
Sign off by Paediatric Clinical Advisory Group, Faculty of Paediatrics, RCPI	August 2020
Sign off by National Clinical Advisory Group Lead (NCAGL), HSE	September 2020
Approved by the CCO CAG (23.10.2020)	October 2020
Guideline Revised and updated (V2)	April 2024
Revised addition (V2) approved by Paediatric CAG	May 2024
Revised addition (V2) approved by NCAGL for Children and Young People	June 2024
Guideline (V2) review date	May 2027