



PAEDIATRICS

NATIONAL CLINICAL GUIDELINE

TITLE:

**Care of the Child Newly Diagnosed with Type 1 Diabetes without
DKA**

Clinical Design and Innovation

Health Service Executive

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Contents

1.0	Aim of Guideline	2
2.0	Purpose and Scope	2
3.0	Background and Introduction	2
4.0	Legislation/other related policies	3
5.0	Glossary of Terms and Definitions.....	3
6.0	Roles and Responsibilities.....	3
7.0	Clinical Guideline	3
7.1	Basic Care	3
7.2	Insulin.....	4
7.3	Blood Testing.....	5
7.4	Baseline blood tests.....	5
7.5	Family History.....	5
7.6	Education	5
7.7	Diet.....	6
7.8	Referrals	6
7.9	Discharge summary for GP.....	6
7.10	Equipment required on Discharge.....	6
8.0	Implementation, Revision and Audit.....	8
9.0	References.....	8
10.0	Qualifying Statement.....	8
11.0	Appendices.....	9
	Appendix 1 Acknowledgements	9
	Appendix 2 Approval Process	9
	Appendix 3 Guideline Update November 2020.....	10

1.0 Aim of Guideline

The aim of this guideline is to provide an evidence-based guideline for the care of the child with suspected or newly diagnosed Type 1 Diabetes Mellitus (T1DM) without diabetic ketoacidosis (DKA).

2.0 Purpose and Scope

2.0 The purpose of this guideline is to improve the management of paediatric patients with newly diagnosed Type 1 Diabetes without diabetic ketoacidosis.

2.1 **This document is for well children.** The classical presentation is polydipsia, polyuria and weight loss.

2.2 If a child presents with the following **treat as a DKA**

- Hyperglycaemia - plasma glucose > 11 mmol/l, glycosuria
- Ketonuria (moderate or large)/ ketonaemia (> 1.5 mmol/L)
- Acidosis - pH < 7.3, Std Bicarbonate < 18mmol/l
- >5% dehydration
- + vomiting
- + drowsy

2.3 These guidelines are intended for healthcare professionals, particularly those in training, who are working in HSE-funded paediatric and neonatal services.

2.4 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 or neonate.

3.0 Background and Introduction

Ireland is a high incidence country for type 1 diabetes with the overall incidence highest in the 10-14yr old age group (Roche 2016). Children with early signs and symptoms of Type 1 diabetes need to be diagnosed promptly, before they become acutely unwell with diabetic ketoacidosis (DKA).

4.0 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/paediaticsandneonatology/paedsmoc.pdf>

5.0 Glossary of Terms and Definitions

DKA	Diabetic ketoacidosis
T1DM	Type One Diabetes Mellitus
BG	Blood Glucose
TFT	Thyroid Function Test
HbA1C	Haemoglobin A1C

6.0 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.

7.0 Clinical Guideline

Discuss with Consultant Paediatrician/Consultant Paediatric Endocrinologist (to decide dose/regimen) before prescribing subcutaneous insulin

7.1 Basic Care

- 7.1.1** Children with suspected diabetes or confirmed new diagnosis of diabetes should always be seen on the same day via ED or other locally agreed paediatric assessment area.
- 7.1.2** If admission is required newly diagnosed children and their families should be accommodated on ward areas familiar with the care of a child with diabetes.
- 7.1.3** The majority of children at presentation do not require intravenous therapy. If not >5% dehydrated and not vomiting, encourage oral sugar free fluids.
- 7.1.4** Every effort should be made at ward level to ensure consistent advice and demonstrate good self-care behaviours (BG checks on time, insulin on time, appropriate meals and snacks, avoiding high sugar foods from diagnosis)

7.2 [Insulin](#)

INSULIN ADMINISTRATION SAFETY ALERT

INSULIN ERRORS CAN HAVE EXTREMELY SERIOUS CONSEQUENCES-always act on patient/family/HCP concerns re doses and recheck -

- Overdoses can cause severe hypoglycaemia, seizures, coma and even death
- Under dosage can result in diabetic ketoacidosis.

Please **INDEPENDENTLY DOUBLE CHECK** doses at each stage-

- When making up an infusion (an insulin syringe graduated in units to measure insulin must be used)
- When infusing via a pump
- When administering via pen (pens and cartridges are SINGLE PATIENT USE ONLY)

ALWAYS CHECK PRESCRIPTION:

- Reconfirm order with the prescriber if unsure/ concerned about the insulin dose
- Avoid abbreviations; insulin should be prescribed in units
- Do not administer an unclear prescription-Prescription **MUST** be rewritten
- Only use an insulin pen or an insulin syringe graduated in units to measure insulin

Doses are tailored to time of day and carbohydrate intake

7.2.1 *Children < 5 years of age*

- Young children may be very insulin sensitive
- Generally start with 0.5 units insulin /kg/day and choice of regimen will be decided by Paediatric Consultant/Paediatric Consultant Endocrinologist on call

7.2.2 *< 12 years of age/prepubertal*

- Generally start with 0.75 units insulin /kg/day
- Choice of regimen will be decided by Paediatric Consultant/Paediatric Consultant Endocrinologist on call

7.2.3 *> 12 years of age, pubertal*

- Pubertal adolescents may be relatively insulin resistant
- Generally start with 1 units/kg/day
- Usually start multiple daily injection regimen

Example (15 year old, 60kg – Well, novomiting)
Glucose 25mmol/L, Ketones 1.5 and PH 7.3

Regimen: multiple daily injections
Calculation: Total daily dose (1 x 60) – 60 units

Breakfast	12 units Rapid acting insulin
Lunch	12 units Rapid acting insulin
Dinner	12 units Rapid acting insulin
Bed-Time	24 units Long acting insulin

7.2.4 Ongoing Dose Adjustment

Insulin doses will be prescribed daily by the Consultant Paediatrician/Consultant Paediatric Endocrinologist. Over the weekend, it will be prescribed by the on call paediatric doctors in conjunction with the Consultant Paediatrician on call who should be contacted if there is any uncertainty re: dose.

7.3 Blood Testing

7.3.1 Children should have blood glucose monitored at least 4 hourly

7.3.2 **Anytime BG > 14mmol/L, check for ketones.**

7.3.3 If BG \geq 14mmol/L and If blood ketone levels > 1.0 mmol/L, the child should be reviewed, as extra fast acting insulin may be required.

7.4 Baseline blood tests

- HbA1c (1.2ml EDTA),
- TFT (1.2ml serum) and anti-TPO (1.2ml serum),
- Diabetes Autoantibodies: anti-GAD, ZnT8 and anti-IA2 antibodies (1.2ml serum to Exeter),
- IgA and TTG (1.2 ml serum)

7.5 Family History

7.5.1 Document detailed family history of diabetes (age at onset, symptoms at onset)

7.6 Education

7.6.1 The CNS Diabetes will develop an education plan for the family

7.6.2 Parent and or patient should be able to demonstrate an understanding of the following

- Overview of Type 1 diabetes

- Blood glucose targets
- Blood Ketone values
- Testing BG and ketones using meter
- Completion of diary
- Insulin type and administration
- Low Blood Glucose –value and how to treat
- High Blood glucose value and how to check Ketones
- Food types and carbohydrate awareness

7.6.3 Further incremental education (tailored to each family)

- Adjustment of Insulin doses.
- Inter current illness management
- General instructions (travel, ID, school, useful websites)

7.7 Diet

7.7.1 Each family requires dietician input with structured education for the child and family (dietary history, recommendations for meals and snacks, begin the process of carbohydrate counting education and dose adjustment).

7.7.2 It is important that a child is not left hungry and appropriate meals and snacks are given on time on the ward.

7.8 Referrals

7.8.1 Refer to Diabetes Retinal Screening programme if ≥ 12 years

7.8.2 Diabetes Register Consent forms

7.8.3 Diabetes Psychosocial team (if available and if required)

7.8.4 Diabetes Ireland information (for peer support)

7.9 Discharge summary for GP

7.9.1 Full typed discharge summary needs to be sent if patient was ill at presentation or is following up in another service

7.10 Equipment required on Discharge

7.10.1 Needs to be prescribed as soon as diagnosed to facilitate early discharge– liaise with Clinical Nurse Specialist Diabetes

7.10.2 Blood glucose strips

7.10.3 Blood ketones strips

7.10.4 Lancets for finger pricking device

- 7.10.5** Mediswabs
- 7.10.6** Ketostixs (Type 2 only)
- 7.10.7** Glucogel x 3 tubes
- 7.10.8** Glucagon x 2
- 7.10.9** Insulin and device depending on regimen
- 7.10.10** Long-term illness form to be completed
- 7.10.11** Blood Glucose Diary

8.0 Implementation, Revision and Audit

- 8.1 Implementation via CEO of each Hospital group and senior management team of each acute hospital
- 8.2 Distribution to other interested parties and professional bodies
- 8.3 The guideline development group has agreed that this guideline will be reviewed on 3 yearly basis.
- 8.4 Regular audit of implementation and impact of this guideline through outcome and process measures is recommended to support continuous quality improvement. It is the responsibility of each unit providing care for children with diabetes and intercurrent illness to audit the unit practise regularly in order to ensure that care in being provided in line with guidelines and that any deviations are clinically justified. 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. Where the audit identifies areas for practise improvement, it is the responsibility of each individual unit to implement changes and re-audit to support continuous quality improvement

9.0 References

- <http://www.olchc.ie/Healthcare-Professionals/Nursing-Practice-Guidelines/Diabetes-New-Patient-Competency-Checklist.pdf>
- <https://www.ispad.org/?page=ISPADClinicalPract>
- Irish Medication Safety Network (2020) Best Practice Guidelines for the Safe Use of Insulin in Irish Hospitals <https://imsn.ie/wp-content/uploads/2020/07/insulin-best-practice-March-2020-with-appendices.pdf>

10.0 Qualifying Statement

- 10.1 These guidelines have been prepared to promote and facilitate standardisation and consistency of practice.
- 10.2 Clinical material offered in this guideline does not replace or remove clinical judgement or the professional care and duty necessary for each child.
- 10.3 Clinical care carried out in accordance with this guideline should be provided within the context of locally available resources and expertise.
- 10.4 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.

11.0 Appendices

Appendix 1 Acknowledgements

This guideline has been developed by the National Clinical Programme for Paediatrics and Neonatology Diabetes Working Group. The members of this group include medical, nursing and dietetic representatives from paediatric diabetes services. The Diabetes Working Group also wish to thank those who provided input and feedback on draft versions of this guideline throughout development, and those who provided valuable input during the consultation process and revision of the guideline including Ms. Ciara Kirke, Clinical Lead, National Medication Safety Programme, HSE and Mr. Donal Burke, Clinical Pharmacist, CHI, Crumlin

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Appendix 2 Approval Process

Sign Off

Sign off by Paediatric Diabetes Working Group	December 2018
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Sign off by HSE CSPD Senior Management Team	February 2019
Guideline update approved by Paediatric Working Group	November 2020
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Appendix 3 Guideline Update November 2020

1. Addition of insulin safety alert
2. Change of abbreviation iu to units for insulin