



Crumlin | Temple Street | Tallaght | Connolly

## NURSING PRACTICE GUIDELINE ON BLOOD GLUCOSE MONITORING OF CHILDREN NOT DIABETES MELLITUS

<b>Area of use:</b>	All of organisation <input checked="" type="checkbox"/>	CHI at Connolly <input type="checkbox"/>	CHI at Crumlin <input type="checkbox"/>
		CHI at Tallaght <input type="checkbox"/>	CHI at Temple Street <input type="checkbox"/>
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**Practice Variances**

None

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### 1.0 Guideline statement

- Blood glucose monitoring is a procedure frequently carried out by staff to determine an infant or child's blood glucose level. A normal blood glucose level is 3.3 -7mmols approximately.
- ICTS states Hypoglycaemia is a level less than 2.7m/mol. Hypoglycaemia is defined as a blood sugar level low enough to cause symptoms of impaired brain function (Harris et al., 2014; Van Kempen et al 2020) the severity depends on the infant/childs age, weight and clinical status. Hyperglycaemia is a blood sugar above 7m/mol.
- The blood sugar level that is acceptable of an infant/child must be determined in consultation with the medical team and monitoring and treatment plan decided on accordingly.
- A portable glucose monitor is used in the department or a blood sample is sent to the laboratory for further analysis.
- Ketones are a waste product in the breakdown of fats in some situations a blood ketone level may be requested. Staff are educated in the theory and practical use of the blood glucose monitors in CHI the management of calibration and quality control is included in this guideline.

### 2.0 Scope

Employees: All full-time, part-time and fixed term employees employed by Children's Health Ireland are covered by this policy.

Agents: Agents may be employees of suppliers, volunteers, students on placement or any other individuals associated with Children's Health Ireland. All such agents are covered by this policy.

### 3.0 Procedures

#### Indications for blood glucose monitoring

Infants < 1year prior to surgery on nil orally
Infants/Children receiving intravenous/Subcutaneous Insulin
Infants/Children receiving Intravenous glucose of 10% or higher.
Infants/Children receiving Intravenous fluids for longer than 12 hours on nil orally
Infants/Children following surgery as part of the post-operative procedure
Known Infants/Children with Diabetes Mellitus and or some metabolic or Glycogen storage disorders
Infants/Children receiving specific medications e.g. Orecotide, Methylprednisilone, Diazoxide
Any alteration in the child's neurological status.
All critically ill children.
Children receiving Total Parental Nutrition (TPN).
Children with seizures.
Clinical signs of dehydration.
History of hypoglycaemia.
Prolonged fasting (Dependent on patient age, weight, past medical history and whether on IV fluid replacement)
History of Insulin Dependent Diabetes Mellitus.

#### Equipment

Gloves.
Cotton wool / Band-Aid.
Calibrated Blood Glucose Monitor
Blood Glucose Test Strips
Single use sterile lancet
Sharps Bin.

#### 4.0 Suggested fasting times

Age	Solid food	Fluid	Clear fluid	No glucose fasting
< 6 months	6 hours	4*	1hour	6 hours
8-12 months	6 hours	4*	1 hour	12 hours
1-2 years	6 hours	6	1 hour	12 hours
2-7 years	6 hours	6	1 hour	12 hours
> 7 years	6 hours	6	1 hour	12 hours

\*Breast milk only. Solid food including milk requires 6hrs

- Encourage drinking of clear, non-fizzy sugar containing solutions (for example, apple juice) until
- 1hour before theatre unless directed otherwise by the anaesthetist in charge of the case.
- Approximately 3mls/kg/hour is acceptable up to a maximum of 200mls/hour. <https://www.olhc.ie/Healthcare-Professionals/Nursing-Practice-Guidelines/Pre-Operative-Fasting-Prior-to-General-Anaesthesia-2019.pdf>

#### 5.0 Procedure

ACTION	RATIONALE & REFERENCE
<p>Prior to the procedure ensure the monitor is checked for the following:</p> <ul style="list-style-type: none"> <li>• The test strips are in date.</li> <li>• That the monitor &amp; test strips have been calibrated together as per manufacturer's instructions.</li> <li>• That if a new pack of strips is required, the monitor is re calibrated.</li> </ul> <p>Quality control calibration must take place as per device in use. This unit will not function unless the steps for calibration are followed with High and Low solutions.</p> <p>Check that the strips are unopened.</p> <p>Check that the glucose /ketone strips are in date and stored out of direct sunlight at 4° - 30°.</p>	<p>To ensure accuracy of the result (Abbott Laboratories Ireland (2011)).</p>

<p>Prepare the lancet device for use as shown as per manufacturer's instructions.</p>	<p>Different devices are in use across CHI so please familiarise yourself with the device on your site and follow the manufacturers instructions</p>
<p>Explain the procedure to the child &amp; parents /carers, taking care to ensure the reason for the blood glucose monitoring is detailed.</p> <p>The physical &amp; psychological preparation depends on the child's age, interests &amp; previous experience.</p> <p>Involve parents in the procedure.</p> <p>Use distraction techniques (if applicable) to reduce anxiety.</p>	<p>To reduce child /parent anxiety &amp; incorporate family centred care in the procedure (Ball, Bindler &amp; Cowen, 2018).</p> <p>The patient should be aware of the procedure in order to alleviate anxieties and to be able to co-operate with the procedure (Wong 2019)</p> <p>Encourage child involvement where possible.</p>
<p>Wash hands, put on gloves &amp; provide a clean environment prior to doing the test.</p>	<p>To prevent infection &amp; contamination (as per CHI ANTT Guideline) <a href="https://www.olhc.ie/healthcare-professionals/chi-nursing-practice-guidelines/antt-guidelines-2022.pdf">https://www.olhc.ie/healthcare-professionals/chi-nursing-practice-guidelines/antt-guidelines-2022.pdf</a></p>
<p>The patient hands should be washed and fingertip should be completely dry. The use of alcohol rub should be avoided.</p>	<p>To ensure hands are clean prior to the procedure and to increase blood supply to the area (Wong 2019, local policies). To ensure a non-contaminated result. Alcohol swabs may alter readings (Wong 2019, Abbott, 2010)</p>
<p>Encourage the child to either sit or lie in a position that is comfortable for them. Some children may not want to see the procedure being carried out.</p>	<p>To ensure the patient's safety as some patients may feel faint when blood is taken.</p>
<p>Encourage patients to keep their hands warm until sampling has been performed.</p>	<p>To encourage good blood flow</p>
<ul style="list-style-type: none"> <li>• Prepare the blood glucose monitor as per manual.</li> <li>• Open the strip packet by tearing at the notch in the foil.</li> <li>• Ensure the lot number on the machine matches the lot number on the strip foil packet.</li> <li>• A lancet device should always be used as it has a measured depth. The depth used is variable depending on what angle the lancet is placed on the skin and the patient age and site chosen.</li> </ul>	

<ul style="list-style-type: none"> <li>Prick the side of the finger using the single use lancet. If necessary, blood can be collected in a capillary tube coated with heparin or EDTA, and then be applied to the test strip within 30 minutes of collection. To avoid unnecessary finger pricking. Ensure the site of piercing is rotated.</li> <li>Avoid frequent use of the index finger and thumb. (The heel may be used in infants). Please ensure the rotated site is documented in the nursing care plans.</li> </ul>	<p>The side of the finger is used, as it is less painful and easier to obtain a 'hanging' droplet of blood.</p> <p>The site is rotated to reduce the risk of infection from multiple stabbing, the areas becoming toughened. It is also rotated to reduce pain.</p>
<p>Patients who learn to do their own blood sampling should be advised to wash their hands in warm water prior to blood sampling.</p>	<p>To minimize the risk of cross infection. (CHI ANTT 2022)</p>
<p>For these patients 'pen' style reusable lancet devices are single patient use only.</p>	
<p>The finger may bleed without assistance or might need assistance by 'milking'. If this is the case gently milk the finger until a drop of blood is available. Avoid extreme squeezing of the puncture sites.</p>	<p>To stop bleeding /prevent blood contamination</p>
<p>If blood is to be taken from a venous/arterial line, remove blood as per hospital policy.</p>	<p>Follow appropriate CVAD guideline</p>
<p>Apply the blood to the target area (test strip) on the glucose /ketone strip. Apply at least 3.5ul to the test area.</p>	
<p>If insufficient blood is available, apply a second drop within 30 seconds. If the second drop is not available within 30 seconds, recommence with a new strip.</p>	<p>To ensure the accuracy of the result.</p>
<p>Apply gentle pressure to puncture site with the use of gauze or a Band-Aid.</p>	<p>To stem the flow of blood</p>
<p>Depending on the type of monitor used, the method used for reading results will differ.</p> <p>Dispose of the lancet in the sharps box. Ensure safe disposal of the gloves, cotton wool etc...</p> <p>Once the result is obtained, record immediately.</p>	<p>To reduce the risk of needle stick injury</p>

Dispose of waste appropriately. Remove gloves and dispose.	As per local guidelines
Make the patient comfortable and observe the site of test for bleeding.	
Wash hands.	
Document in the infant/child’s notes the effectiveness of therapy, together with any side effects or problems encountered.	
	To reduce the risk of cross infection, as per local guidelines.
	Maintains accountability through accurate recording of nursing intervention NMBI (2016)

**Normal Blood Glucose Ranges must be determined by the medical team caring for the child. See broad parameters below.**

Child without Diabetes.	4 – 7 mmols/litre
Insulin Dependent Diabetic < 1 year	5 – 9.5 mmols/litre (Accepted target level)
Insulin Dependent Diabetic > 1 year	4-8.5mmols / litre (Accepted target level)

**NOTE:**

**If Blood sugar is < 3.3mmols / litre, please follow Hypoglycaemia guidelines available on the hospital intranet: [http://olchcnet.hse.ie/chi at crumlin clinical guidelines/clinical guidelines/hypoglycaemia.pdf](http://olchcnet.hse.ie/chi_at_crumlin_clinical_guidelines/clinical_guidelines/hypoglycaemia.pdf)**

**Management of Hypoglycaemia in Infants <12mths: [http://olchcnet.hse.ie/chi at crumlin clinical guidelines/clinical guidelines/hypoglycaemia in infants.pdf](http://olchcnet.hse.ie/chi_at_crumlin_clinical_guidelines/clinical_guidelines/hypoglycaemia_in_infants.pdf)**

If Blood sugar is elevated with ketones present, contact endocrine team for further guidance and follow guidelines for management of children with Diabetes Mellitus (Murphy et al 2004)

**6.0 Glossary of acronyms, terms and definitions**

*All acronyms, abbreviations or infrequently used terms should be defined here.*

**7.0 Monitoring, audit and evaluation**

This PPPG will be reviewed and updated at least every three years by the document author/owner, or earlier if required due to updated guidance, evidence or legislation. Compliance with key principles or procedures described within this PPPG should be audited on an annual basis.

**8.0 Key stakeholders**

The following key stakeholders were involved in developing and/or reviewing this document:

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