Meeting the Care Needs of **Primary School Children with Type 1 Diabetes during School Hours**

Clinical Design and Innovation
Health Service Executive

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Person-centred, co-ordinated care

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An Chomhairle Náisiúnta um Oideachas Speisialta
National Council for Special Education

Contents

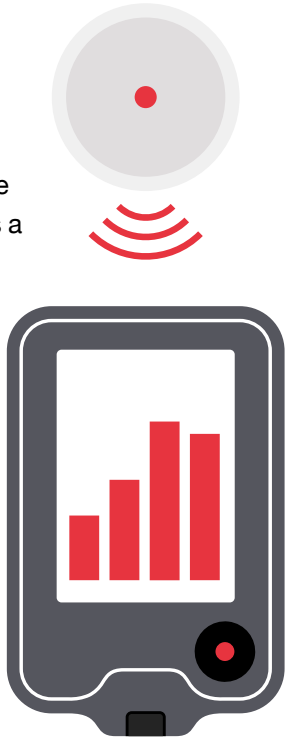
1 Glossary of Terms and Definitions

Blood Glucose Levels

Blood Glucose Levels are checked with an individual hand-held blood glucose meter or glucometer by finger pricking. There are many different varieties and they all work in a very similar way. The blood glucose levels are displayed on a screen with general agreement that a level of:

- **Less than 4.0 mmol/L** = Low blood glucose level (Hypoglycaemia). Requires action [see **Personal Pupil Plan** (PPP) Appendix 1a & 1b]
- **Between 4.0 - 8.0 mmol/L** = Blood glucose level in target
- **More than 11.1 mmol/L** = High blood glucose levels (Hyperglycaemia) (may require action see PPP)
- **More than 14.0 mmol/L** = Very high blood glucose levels (Hyperglycaemia); indicates need for blood ketone check and may require additional action - see PPP

Continuous glucose monitors



Continuous glucose monitors are devices that take a reading from a sensor attached to the child's body which gives a continuous read of tissue glucose that may be displayed on the device/reader or transmitted to a mobile phone. These devices have trend arrows which indicate if glucose level is rising or falling. There is a physiological lag between tissue and blood glucose levels so the readings may be expected to differ at times when the blood glucose is changing quickly and during hypoglycaemia when a finger prick blood glucose reading is required.

- **Less than 4.0 mmol/L** = Low (tissue) glucose level (Hypoglycaemia) – (*confirm glucose level with finger prick)* requires action (see PPP)
- **Between 4.0 - 8.0 mmol/L** = Normal (tissue) glucose level in targets
- **More than 11.1 mmol/L** = High (tissue) glucose levels (Hyperglycaemia)
- **More than 14.0 mmol/L** = Very high (tissue) glucose levels (Hyperglycaemia); indicates need for blood ketone check and may require additional action (*confirm glucose level with finger prick)* (see PPP)

Flash glucose monitors

Flash glucose monitors such as the Freestyle Libre are devices that take readings from a sensor worn on the child's arm which is displayed on the device or a phone app. The device also displays a trend arrow. These devices have trend arrows which indicate if glucose level is rising or falling. There is a physiological lag between tissue and blood glucose levels so the readings may be expected to differ at times when the blood glucose is changing quickly and during hypoglycaemia when a blood glucose reading is required.

- **Less than 4.0 mmol/L** = Low (tissue) glucose level (Hypoglycaemia) (*confirm glucose level with finger prick)* requires action (see PPP)
- **Between 4.0 - 8.0 mmol/L** = Normal (tissue) glucose level in targets
- **More than 11.1 mmol/L** = High (tissue) glucose levels (Hyperglycaemia)
- **More than 14.0 mmol/L** = Very high (tissue) glucose levels (Hyperglycaemia); indicates need for blood ketone check (*confirm glucose level with finger prick*) requires action (see PPP)

Hypoglycaemia

Hypoglycaemia occurs when the blood glucose is **below 4.0 mmol/L** and pupil feels unwell (see Appendix **3a**). For some children, the level at which action is required may be higher. The pupil's diabetes team will determine the level that warrants treatment and will outline an action plan in the PPP.

Hyperglycaemia

Hyperglycaemia occurs when the blood glucose level rises **above 11.1 mmol/L** (see Appendix **3b**). The pupil's diabetes team will determine the level that warrants acute treatment and will outline an action plan in the personal pupil plan (PPP). Generally, a once off reading of greater than 14.0 mmol/L with ketones less than 0.6 mmol/L without symptoms is not a cause for concern (but if there is a pattern of high readings at the same time daily, insulin dose adjustment may be required and the family will need to consult their diabetes team). If blood glucose is greater than 14 mmol/L, ketones need to be checked (see below) and actions need to be considered based on the child's PPP.

Ketones

Ketones (see Appendix **3c**) are acid products that are formed in large amounts if there is insufficient insulin to facilitate glucose transport into body cells for energy generation. It is important to **test for ketones** if the blood glucose is **higher than 14.0 mmol/L or the pupil vomits (regardless of blood glucose level)**. If ketone levels are elevated i.e. greater than 0.6 mmol/L, action may be required (see PPP).

2 Background

Type 1 Diabetes Mellitus (T1DM) is a chronic autoimmune condition where the pancreas stops making the hormone insulin. Insulin allows glucose (from carbohydrate in the diet) to move from the blood into body cells for energy. The brain uses glucose as fuel so low blood glucose levels are dangerous in the short term, and if not recognised and treated, can result in collapse and seizure. Untreated or insufficiently controlled diabetes can lead to extended periods of high blood glucose levels which can cause damage to the nerves, brain, blood vessels and in particular, can cause damage to small blood vessels, leading to diabetes related complications:

- Diabetic retinopathy: occurs when small blood vessels at the back of the eye are damaged and can lead to loss of sight
- Diabetic kidney disease: which can cause kidney failure
- Diabetic neuropathy: damage to small nerves can cause serious foot problems.

Chronic high blood glucose levels can also cause blood vessel blockages and increase the risk of heart attack and circulatory problems in legs and feet. Optimal diabetes control using intensive insulin therapy is critical to the prevention of short and long term diabetes related complications.

The National Clinical Programme for Paediatric Diabetes promotes the health and wellbeing of children and adolescents with diabetes. Optimal outcomes depend on adequate provision of supervision and assistance during school hours to facilitate intensive diabetes management during this period which represents a major part of a young child's life. In 2015 Dr Stephen O'Riordan, the then National Clinical Lead for paediatric diabetes, established a subgroup led by Prof Michael O'Grady to develop a position paper on best practice for the management of T1DM in Irish primary schools. Stakeholders (school principals, special education providers, representative nurses and patient advocates) were identified and a series of meetings were convened to complete a literature review of international best practice and to explore current diabetes management experiences of Irish primary school children during schools hours.

Schools have a responsibility to provide a safe environment and adequate assistance, support and supervision to all pupils. The International Society for Paediatric and Adolescent Diabetes states that a child at school (by the laws of that country), should have access to similar (or superior) care to the care provided at home (Goss et al. 2018). School staff members need to know enough about diabetes to ensure that the affected child is able to fully participate in the school curriculum safely.

2.1 Terms of Reference

The Terms of Reference for the group were to design a framework for diabetes management of primary school children during the school day which meets the requirements of quality diabetes management, but is also flexible enough to allow effective implementation at local level by school authorities.

Group Membership

The original group consisted of:

- Prof Michael O'Grady (Consultant Paediatrician and Endocrinologist)
- Mr Kieran O'Leary and Dr Anna Clarke (Diabetes Ireland)
- Mr Padraig McCabe (Irish Primary Principals Network)
- Ms Dympna Devenney (Irish Diabetes Nurse Specialist Association)
- Mr Anthony Torrance (National Council for Special Education)
- Ms Helen Burke (Advanced Nurse Practitioner, Diabetes)

Paediatric Diabetes Working Group Members

Professor Nuala Murphy	National Clinical Lead Paediatric Diabetes, Consultant Paediatric Endocrinologist
Ms. Shirley Beattie	Senior Paediatric Diabetes Dietitian
Dr Anna Clarke	Health Promotion and Research Manager, Diabetes Ireland
Professor Declan Cody	Consultant Paediatric Endocrinologist
Dr Claire Crowe	Senior Clinical Psychologist: Paediatric Diabetes & Endocrine Psychology
Ms Jacqueline de Lacy	Programme Manager National Clinical Programme for Paediatrics and Neonatology
Ms. Aisling Egan	Clinical Nurse Specialist Diabetes
Dr Kate Gajewska	Clinical Manager for Advocacy and Research, Diabetes Ireland
Ms Siobhán Horkan	Programme Manager National Clinical Programme for Paediatrics and Neonatology (2018)
Ms. Claire Maye	Clinical Nurse Specialist Diabetes
Dr Vincent McDarby	Senior Paediatric Psychologist (2020)
Ms. Cathy Monaghan	Senior Paediatric Diabetes Dietitian
Prof Michael O'Grady	Consultant Paediatrician and Endocrinologist
Ms. Cliodhna O Mahony	Programme Manager National Clinical Programme for Diabetes (Adult)

2.2 The Scale of the Need

Ireland is an area of high T1DM prevalence (Roche et al. 2014). Figures from *the Irish Childhood Diabetes Register* report that there are 1300 Irish children aged between 4-13 years with T1DM and of these approximately 275 (20%) are aged between 4-8 years and 1081 (80%) are aged between 8-13 years. Optimal diabetes control using intensive insulin therapy is critical to prevention of diabetes related complications but also has important academic benefits for schoolchildren (Desrocher & Rovet 2004).

2.3 Key Recommendations:

I. Irish primary school children should receive appropriate assistance, support and/or supervision to allow them to fully participate in all curricular areas safely while maintaining optimal diabetes control.
II. Insulin regimens should be tailored to the needs of the child to achieve optimal diabetes control and not compromised to avoid the need for assistance or support during the school day.
III. Reasonable assistance is expected from the school to meet the care needs of pupils with diabetes including support from school personnel with blood glucose monitoring (increasingly with wearable technology such as Freestyle Libre and continuous glucose monitors) and insulin administration during the school day as needed.
IV. Health Care Professionals should standardise how they recommend provision of Special Needs Assistance based on the care needs of children with T1DM.
V. All primary school children with T1DM should have a personal pupil plan (PPP) which should be reviewed with the parent/guardian in conjunction with the paediatric diabetes team at least annually, preferably at start of term.
VI. Class teachers, Special Needs Assistants and any relevant school staff should have appropriate training in the care needs of children attending their school. Training should be individualised and may be provided by parents/guardians depending on the care need of the child and the ability/confidence of the family in conjunction with the child's diabetes team.

3 Diabetes Management

Type 1 Diabetes management is onerous and is required 24 hours a day, 7 days a week. The goal of effective diabetes management is to maintain blood glucose levels within a target range (which is individualised) but is generally between 4-8 mmol/L. Effective diabetes management requires careful balance between carbohydrate intake in food (raises blood glucose levels) and physical activity (generally lowers blood glucose levels) and insulin administration (lowers blood glucose levels) to prevent low or high blood glucose levels.

Intensive insulin therapy is defined as either a multiple daily injection regimen (generally 4 or more injections per day) or insulin pump therapy (continuous insulin infusion). Intensive insulin regimens allow more accurate insulin dose titration because the insulin used as part of intensive therapy has a more predictable effect on blood glucose levels with less day-to-day variation in absorption. Their use has also been associated with a reduction in the risk of hypoglycaemia (low blood sugars) (Ford Adams ME 2003, Bangstad HJ 2009). In addition to the negative consequences of high blood glucose readings on affected children's physical health, recurrent high or low blood glucose levels also impacts academic performance.

Younger primary school pupils with diabetes, require the support of an adult to safely undertake self-care while attending school. Over time, with training and support, pupils might be expected to incrementally undertake more of their own diabetes related care tasks. Promoting age appropriate assumption of responsibility and independence for personal care is the goal but depends on the individual child's developmental capabilities. Depending on the developmental stage, children with diabetes are encouraged to undertake self-care tasks with support and supervision. This means that

the older child and adolescent (depending upon the child's age and abilities) may be self-administering insulin with a pen, or continuously through an insulin pump, monitoring his/her blood glucose levels with a meter or using a sensor, and taking snacks/meals as needed depending on their diabetes regimen. Where medication administration is required during the school day, training is required in line with the Irish National Teachers Organisation (INTO) administration of medications procedures.

When a pupil with diabetes is enrolled in school or a current pupil is diagnosed with diabetes, teachers and Special Needs Assistants require training and support. Effective diabetes management in school requires a carefully thought-out proactive plan which should be developed through collaboration with the parents/guardians, diabetes team and school staff. Designated staff responsible for meeting the care needs of the pupil need to receive specific training which may generally be provided by the child's family in conjunction with the child's diabetes team.

Effective diabetes management is essential:

- For the immediate safety of the pupil with diabetes
- To facilitate the pupil's engagement in learning and allow the pupil to fully participate in all school activities
- To minimise the possibility of diabetes related emergencies that may disrupt school activities
- To preserve the long-term health of the pupil with diabetes

International Guidelines clearly outline the supports required and standards of care for children with Type 1 diabetes in school. These include having an individualised care plan and facilitating intensive insulin therapy during the school day (ISPAD 2018, AADE 2016, ADA 2014, Pal & Edge 2013). In a recent study of 418 primary school children with T1DM in Ireland, 37.5% did not have a written school emergency management plan but most (74%) Irish primary school age children are already using intensive insulin regimens (McCollum D et al. 2018).

4 Governance

The care of the child with diabetes during school hours is the responsibility of the Board of Management. The Department of Education and Science (DES) Governance Manual for Primary Schools 2019-23*;* sets out the role of the board of management. Under the Education Act, 1998, boards have a duty to provide, or cause to be provided, an appropriate education for each student at the school. The DES governance manual (2019-23) states that *"to effectively carry out this duty, appropriate and regular oversight by the board of the teaching and learning in the school should be in place"*. The day to day practical issues are within the remit of the principal through the teacher. Where the child is deemed to have supervisory/ assistance needs above those of another child of the same age and capabilities, the school with guidance from the child's diabetes team may seek the support of a Special Needs Assistant.

In Ireland, several frameworks exist which require schools to support the care of children with Type 1 diabetes. The Disability Act 2005 and the Education for Persons with Special Educational Needs 2004 (EPSEN) aim to ensure that school environments are inclusive and the needs of such children are accommodated.

Although Type 1 diabetes is not considered a disability in educational terms, children with the condition are provided for under this legislation and schools must not prevent students from engaging in particular activities, except in cases of reasonable justification. A New School Inclusion Model to Deliver the Right Supports at the Right Time to Students with Additional Care Needs (2018) proposes a model of how current practice will be altered to accommodate current needs. Irish legislation covering the specific care needs of children with Type 1 diabetes attending school is currently lacking. However, the Board of Management retain the responsibility to ensure the care needs of all pupils are met.

Government policy aims to be inclusive and person centred. Not all children with diabetes will have care needs that require non-teaching support during school hours. Age and presence of co-morbidities or behavioural issues will influence the need for support. Younger children based on age alone are unable to self-care independently and require additional support.

5 Diabetes Management during School Hours

Appropriate diabetes management during school hours is necessary for the pupil's immediate safety, long-term well-being and optimal academic performance. The goal of care is the maintenance of normal blood glucose levels so that the child may fully partake in all educational and social activities during school hours.

Providing assistance in checking blood glucose levels, administering insulin, supervising food intake during school hours, preparing for exercise, dealing with low or high blood glucose, are a few examples of the care needs of pupils with diabetes. These care needs are commonly outlined in a document called a Personal Pupil Plan (PPP) and are based on national guidelines for families.

To enable the provision of appropriate diabetes management, school staff require support and training in diabetes management and in the treatment of diabetes emergencies. A whole school approach is required to raise awareness of the care needs of the pupil with T1DM.

5.1 Determining Need for Non-Teaching Support

Intensive insulin therapy is the standard of care for Type 1 diabetes. Young children, who do not have the developmental capabilities for self-care, depend on adult support for intensive insulin therapy management and others for tasks such as blood (or tissue) glucose monitoring, insulin administration, adjustment of food/ insulin doses for physical activity and management of blood glucose levels outside the normal range. During the school day, primary school children depend on the support of school staff to ensure that their diabetes care needs are met. Special Needs Assistants work with children who need extra non-teaching support and since 2008 includes provision for children with a significant medical need. The relevant guidance from the Department of Education and skills is Circular 0030/2014 and Circular 0030/2020.

For diabetes management, it is generally accepted that the ability of children in the junior years in primary school (or approximately < 8 years) and those in the later classes (from 3rd class onwards) are distinct in terms of their abilities to meet personal care needs. Therefore, the PPPs need to be age sensitive **(see Appendix 1a & 1b)** and updated regularly. The paediatric diabetes team is best placed to determine the level of support needed as they know the diabetes management schedule and the child's capabilities which may be influenced by age, time since diagnosis, family support, other medical or social issues (**see 5.2:** *Matrix of Support Intensity for Children with T1DM*).

The management schedule is founded on a series of activities based on optimising diabetes management that is required regularly during the day for each child with diabetes. The activity titles used are those generally agreed to be the most widely needed for a young person with diabetes and are understood by all the diabetes community and should be the ones referred to when determining non-teaching support. Special Needs Assistants need to have the required level of knowledge, skills and training to deliver the support competently during the school day.

Carrying out tasks requires additional training and is based on the assumption that the Special Needs Assistant is taking responsibility for completing each task in a timely and appropriate manner. **Assisting** is based on the assumption that the pupil can partly do the task but requires practical additional help to do so e.g. interpreting blood glucose results. **Supervising** is based on the assumption that the pupil can complete the tasks but does not have sufficient capability to be deemed competent.

Examples of primary care needs that children with diabetes may require include:

- Assistance with feeding in the form of supervision that snack/lunch is eaten and extra snack given before physical activity if in PPP
- Administration of medicine – this may be actual administration by injection of insulin (rare) or alteration of computer assisted delivery of insulin through an insulin pump
- Assisting teachers to provide supervision in the class, playground and school grounds so that acute complications of diabetes, particularly hypoglycaemia (low blood glucose) are recognised and managed promptly and appropriately
- Care needs such as blood glucose testing as an aid to give appropriate medication or to confirm the onset of hypoglycaemia or hyperglycaemia so that appropriate action is taken.

Examples of secondary care associated tasks may include:

- Maintain the personal pupil plan and diabetes management plan
- Maintaining a care monitoring system and communicating that to the parents/guardians
- Planning for activities where additional glucose management actions may be required – exercise requires a blood glucose check and appropriate action
- Assistance so that pupil can attend school related activities – day trips, attendance at events outside school grounds e.g. when teachers cannot adequately provide the supervision required.

5.2 Matrix of Support Intensity for Children with T1DM

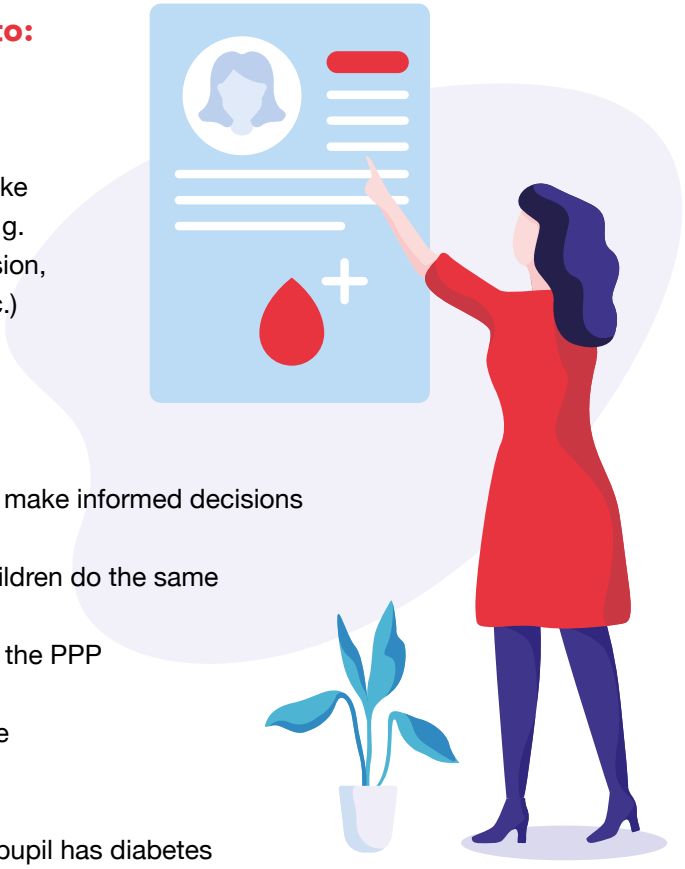
	Low intensity support **(Supervise)**	Moderate intensity support **(Assist)**	High intensity support **(Carry out)**	Score
Insulin administration	Student competent in insulin administration **(1 point)**	Student carries out insulin injection or pump bolus but needs assistance **(3 points)**	Insulin injection or pump bolus administered by assistant as student not capable **(6 points)**	
Blood glucose testing	Student can test, record and interpret blood glucose **(1 point)**	Student can test and/ or record blood glucose but requires assistance with interpretation **(2 points)**	Student unable to test, record or interpret blood glucose **(3 points)**	
Recognition of low blood glucose	Student recognises physical symptoms of low blood glucose most of the time **(1 point)**	Student sometimes recognises physical symptoms of low blood glucose and requires adult supervision **(3 points)**	Student rarely/never recognises physical symptoms of low blood glucose and requires close adult supervision **(6 points)**	
Management of low blood glucose	Student able to give appropriate treatment **(1 point)**		Student dependent on assistance to give the appropriate treatment **(3 points)**	
Management of high blood glucose	Student able to administer the appropriate treatment **(1 point)**		Student dependent on assistance to check for ketones and administer the appropriate treatment **(3 points)**	
Regular meals and snacks		Ensures supplied snacks are consumed in a timely manner **(1 point)**		
Carbohydrate counting	Student competent at carb counting **(1 point)**	Student has awareness of carb amounts but needs assistance with calculations **(2 points)**	Pupil unable to carb count and requires this to be carried out **(3 points)**	
Management of physical activity	Student competent in managing without supervision **(1 point)**	Student carries out most appropriate steps but requires assistance **(2 points)**	Tests glucose prior to activity and adjusts treatment as required. **(3 points)**	
TOTAL SCORE				

Scoring system: An individual score is assigned in each of the 8 categories which is then totalled - The total score of **8** or more supports an application for inclusion support. The higher the total score, the greater the degree of support required.

6 Roles and Responsibilities

The well-being of a pupil with diabetes requires a collaborative relationship between the school and home. The child and his/her family in conjunction with the hospital diabetes team are responsible for providing the school management with a PPP at the onset of each school year so that school management can ensure that the care needs of the pupil are met.

School management has responsibility to:



- Ensure all school staff are diabetes aware
- Ensure staff (Teachers and SNAs) undertake specific diabetes training as necessary (e.g. insulin injection administration or supervision, insulin pump, glucagon administration etc.)
- Promote a supportive environment for the pupil with diabetes
- Have sufficient knowledge on diabetes to make informed decisions
- Treat the child normally and help other children do the same
- Provide sufficient resources to implement the PPP
- Know what to do in an emergency and the order of responsibility for emergency care
- Ensure substitute teachers know when a pupil has diabetes and that they are familiar with classroom procedures
- Ensure diabetes supplies and equipment are accessible and readily available in suitable locations
- Have a diabetes care policy including guide to appropriate 'sharps' (needle) disposals in place

The parents/guardians of a child with diabetes have responsibility to:

- Inform the Board of Management, school principal and the teacher that their child has diabetes
- Attend and participate in school meetings to provide sufficient/additional information so that the care needs of the pupil are defined based on the PPP supplied by the diabetes team

- Inform school staff of any changes in their child's health status or diabetes regimen
- Ensure their child's insulin (if administration is required during the school day) and glucose meter is labelled with the child's full name. Ensure insulin and all necessary equipment (blood glucose meter, lancet device, strips, insulin pump consumables, sharps disposal etc.) are within the expiry date and that the child has a hypo remedy with them each day to treat low blood glucose (hypoglycaemia)
- Parents/guardians provide the school with a sharps disposal unit and dispose of it when it is full. Disposable gloves and information about the safe disposal of needles/syringes in a sharps container should also be made available **(see appendix 4 for further information)**
- Provide information about their child's meal/snack schedule which should be tailored to fit into the daily school timetable (where possible)
- Provide the school with appropriate treats for their child for special events such as parties
- Provide the school with the daily medical kit and be responsible for restocking any used items and ensuring items with expiration dates are in date. The kit might include:
  - ✓ Blood glucose meter, testing strips, and lancets
  - ✓ Blood ketone test strips and meter
  - ✓ Insulin and appropriate supplies (if the pupil requires insulin during school hours)
  - ✓ Quick-acting source of glucose for Hypoglycaemia treatment for the classroom, office and other places that the pupil may spend time e.g. carbohydrate-containing snacks.
- In addition, the school should be provided with an emergency supply kit for use parents/guardians should be responsible for restocking any used items and ensuring items with expiration dates are in date. The kit should include:
  - ✓ Water wipes for cleaning fingers
  - ✓ Quick-acting source of glucose for Hypoglycaemia treatment such as Glucogel
  - ✓ Glucagon emergency kit

The pupil should assume responsibility consistent with their ability, for:

- Monitoring and recording her/his blood glucose as per PPP
- Informing adults of symptoms if unwell or hypoglycaemic
- Undertaking agreed self-care tasks as per agreed PPP

7 Pre-emergency Care

Despite best efforts from all involved in providing care to a child with Type 1 diabetes, medical problems may arise, albeit rarely. Certain short-term complications, such as low blood sugar, high blood sugar and high ketones require immediate care (see Appendix 2).

Unrecognised hypoglycaemia can cause seizures and loss of consciousness (coma). This is a very rare occurrence (in the past 20 years, there were only 2 or 3 episodes nationally during the school day, in the whole country). First line management of these rare emergencies is as per any other emergency situation. Additional professional help/assistance locally should be called and parents/guardians of the child should be informed as soon as safely possible.

Call for help early:

- Ring 999/112
- Emergency Management:
  - ABC
    - **Airway:** open their airway and place in recovery position
    - **Breathing:** Check the child is breathing
    - **Circulation:** Commence CPR if child is not breathing
  - Once established that unresponsive child is breathing, check finger prick glucose and **if low (less than 4 mmol/L), give glucagon injection (orange needle)** if trained to do so.
- Keep child warm (Blanket tucked around person)
- Gather all relevant information for immediate handover to professional on arrival.

8 Appendices

Appendix 1a Personal Pupil Plans for 4-8 Age Group

Personal Pupil Plan for 4-8 Age Group

Picture

Contact details

Pupil Name _____ Class _____ DOB _____

Other siblings in school _____

Parents _____

Home Telephone _____

Contact 1 _____ Relationship _____ Mobile _____ Work _____

Contact 2 _____ Relationship _____ Mobile _____ Work _____

Home address _____

GP Contact _____ Hospital Contact _____ Diabetes Nurse _____

Medical condition(s)

_____

School _____ Teacher _____ SNA _____

Insulin Administration

Review Date / /

☐ 2/3 times daily ☐ 4 times daily ☐ Insulin pump

Care needs of (insert pupil name) _____ within school setting.

Blood glucose monitoring	The target level for blood glucose is _____ Supervise pupil or carry out blood glucose measurement ☐ Mid-morning ☐ Before lunch ☐ Before planned activity ☐ When Hypo/hyperglycaemia is suspected ☐ Other
Dietary Needs	Supervise the intake of: ☐ Break snack ☐ Lunch ☐ Snack Before planned activity
Insulin administration	Supervise pupil or help to administer insulin via: ☐ Pen ☐ Insulin Pump ☐ Mid-morning ☐ Before lunch ☐ Other
Planned Exercise	Check/supervise pupil to check the blood glucose level before exercise and if less than _____ consider a small snack such as _____
Vomiting or pupil feeling unwell	Parents should be contacted immediately if pupil vomits, regardless of blood glucose or ketone levels. The pupil should be collected by their parents. If parents are delayed, blood ketones should be checked, regardless of what pupil's blood glucose level is. Continued over

Hypoglycaemia – can happen quickly but the warning signs are usually noticeable by the pupil or by the adults around them. Constant vigilance and prompt action can prevent events.

Hypo Box is kept at _____

Specific warning signs of Hypoglycaemia – tick all that applies to this pupil as the signs/symptoms differ in each pupil but remain constant.

- ☐ Shakiness
- ☐ Tiredness
- ☐ Dizziness
- ☐ Sweating
- ☐ Hunger or stating tummy is "funny"
- ☐ Behaviour changes, such as crying for no apparent reason
- ☐ Irritability or being badly behaved
- ☐ Pale skin colour or glazed look on face/eyes
- ☐ More moodiness or quieter than normal
- ☐ Difficulty paying attention, or confusion
- ☐ Unable to speak properly
- ☐ Headache

Presence of any symptom necessitates a blood glucose check and if less than _____mmol/L action is required regardless of time. Failure to do so may result in the pupil collapsing and going unconscious.

1. Give 10-15g of fast acting carbohydrate such as

   _____ or _____ or _____

2. Repeat blood glucose measurement after 10-15 minutes and if **not** above _____ mmol/L give the fast acting carbohydrate again.

3. On recheck, If blood glucose level above _____ mmol/L give slow acting carbohydrate such as _____ or _____ or _____

4. If pupil unable to take food, give Glucogel™ if trained to do so or call emergency assistance.

5. If pupil unresponsive, call emergency assistance and give glucagon. If the child is less than 6 years (or less than 25 kg), give half a vial of glucagon (0.5mg); if 6 years or older (or 25kg or greater), give full vial (1 mg) glucagon, if competent and trained to do so.

NEVER LEAVE A PUPIL WITH HYPOGLYCAEMIA without adult supervision.
IF IN DOUBT, TREAT AS HYPO – less dangerous than not to.

Hyperglycaemia

1. Blood glucose level 8 - 11 mmol/L: no specific action is needed in school. Family will monitor and liaise with diabetes team if a pattern of higher readings is identified.
2. Blood glucose level 11.1 - 13.9 mmol/L: give glass of water and recheck in one hour. If pupil is using an insulin pump, check that it is functioning properly.
3. Blood glucose is greater than or equal to 14mmol/L: check ketone level and give a glass of water. Contact family to discuss need for correction dose of insulin and/or collection of the child depending on the levels.

   General action plan for ketones

   a. Ketone level under 0.6 mmol/L: give glass of water and recheck in 1-2 hours.
   b. Ketone level 0.6 - 1.5 mmol/L*: supplementary insulin may be required and should be given if the support is competent and trained to do so after contacting parents to discuss the dose. Recheck after 1-2 hours.
   c. Ketone level greater than 1.5 mmol/L*, intervention should occur without delay – contact parents to collect the child who should then liaise with their diabetes team.
   d. If unable to contact parents and child is unwell with ketones greater than 2.5 mmol/L call an ambulance.

*If a child is using an insulin pump and ketones are greater than 0.6, please contact family as pump site change and pen correction is very likely needed

Appendix 1b Personal Pupil Plan – Over 8 years

Personal Pupil Plan for Over 8 Age Group

Picture

Contact details

Pupil Name _____ Class _____ DOB _____

Other siblings in school _____

Parents _____

Home Telephone _____

Contact 1 _____ Relationship _____ Mobile _____ Work _____

Contact 2 _____ Relationship _____ Mobile _____ Work _____

Home address _____

GP Contact _____ Hospital Contact _____ Diabetes Nurse _____

Medical condition(s)

_____

School _____ Teacher _____ SNA _____

Insulin Administration

Review Date / /

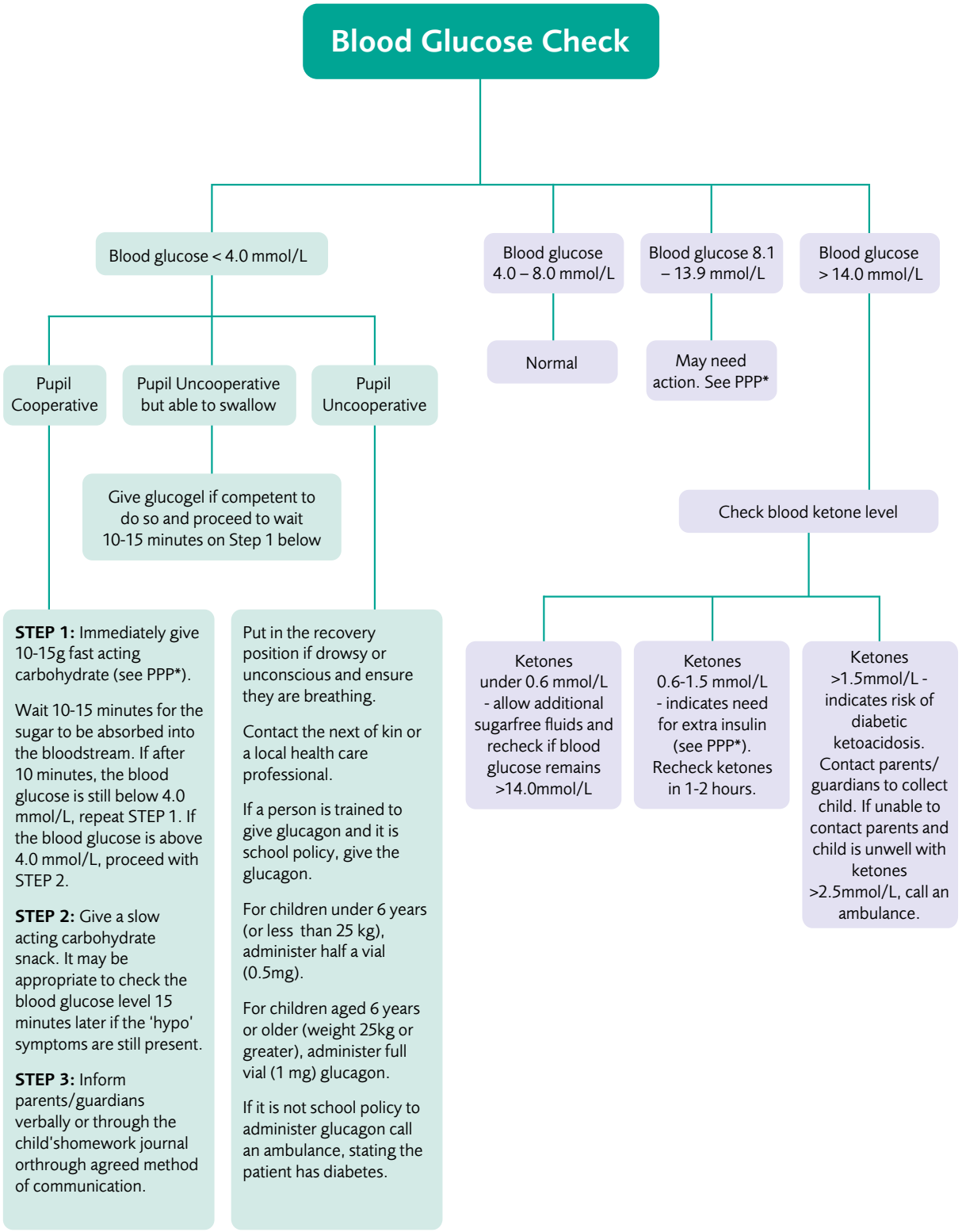
☐ 2/3 times daily ☐ 4 times daily ☐ Insulin pump

Care needs of (insert pupil name) _____ within school setting.

Blood glucose monitoring	The target level for blood glucose is _____ Supervise/allow pupil or carry out blood glucose measurement ☐ Mid-morning ☐ Before lunch ☐ Before planned activity ☐ When Hypo/hyperglycaemia is suspected ☐ Other
Dietary Needs	Supervise/allow the intake of: ☐ Break snack ☐ Lunch ☐ Snack Before planned activity
Insulin administration	Supervise/allow pupil or help to administer insulin via: ☐ Pen ☐ Insulin Pump ☐ Mid-morning ☐ Before lunch ☐ Other
Planned Exercise	Supervise/allow pupil to check the blood glucose level before exercise and if less than _____ consider a small snack such as _____
Vomiting or pupil feeling unwell	Parents should be contacted immediately if pupil vomits, regardless of blood glucose or ketone levels. The pupil should be collected by their parents. If parents are delayed, blood ketones should be checked, regardless of what pupil's blood glucose level is. Continued over

Hypoglycaemia – can happen quickly but the warning signs are usually noticeable by the pupil or by the adults around them. Constant vigilance and prompt action can prevent events.	Hypo Box is kept at _____ Specific warning signs of Hypoglycaemia – tick all that applies to this pupil as the signs/symptoms differ in each pupil but remain constant. ☐ Shakiness ☐ Tiredness ☐ Dizziness ☐ Sweating ☐ Hunger or stating tummy is "funny" ☐ Behaviour changes, such as crying for no apparent reason ☐ Irritability or being badly behaved ☐ Pale skin colour or glazed look on face/eyes ☐ More moodiness or quieter than normal ☐ Difficulty paying attention, or confusion ☐ Unable to speak properly ☐ Headache **Presence of any symptom necessitates a blood glucose check and if less than _____mmol/L action is required regardless of time. Failure to do so may result in the pupil collapsing and going unconscious.** 1. Give/advise eating 10-15g of fast acting carbohydrate such as _____ or _____ or _____ 2. Repeat blood glucose measurement after 10-15 minutes and if **not** above _____ mmol/L give the 10-15g fast acting carbohydrate again. 3. On recheck, If blood glucose level above _____ mmol/L give slow acting carbohydrate such as _____ or _____ or _____ 4. If pupil unable to take food, give Glucogel™ if trained to do so or call emergency assistance. 5. If pupil unresponsive, call emergency assistance and give glucagon. For a child 6 years or older (or 25kg or greater), give full vial (1 mg) glucagon, if competent and trained to do so. NEVER LEAVE A PUPIL WITH HYPOGLYCAEMIA without adult supervision. IF IN DOUBT, TREAT AS HYPO – less dangerous than not to.
Hyperglycaemia	1. Blood glucose level 8-11 mmol/L: no specific action is needed in school. Family will monitor and liaise with diabetes team if a pattern of higher readings is identified. 2. Blood glucose level 11.1 -13.9 mmol/L give glass of water and recheck in one hour. If pupil is using an insulin pump, check that it is functioning properly. 3. Blood glucose level greater than or equal to 14 mmol/L, check ketone level and give a glass of water. Contact family to discuss need for correction dose of insulin and/or collection of the child depending on the levels. General action plan for ketones a. Ketone level under 0.6 mmol/L: give glass of water and recheck in 1-2 hours. b. Ketone level 0.6-1.5 mmol/L*: supplementary insulin may be required and should be given if the support is competent and trained to do so after contacting parents to discuss the dose. Recheck after 1-2 hours. c. Ketone level: greater than1.5 mmol/L*, intervention should occur without delay – contact parents to collect the child who should then liaise with their diabetes team. d. If unable to contact parents and child is unwell with ketones greater than 2.5 mmol/L call an ambulance. *If a child is using an insulin pump and ketones are greater than 0.6, please contact family as pump site change and pen correction is very likely needed

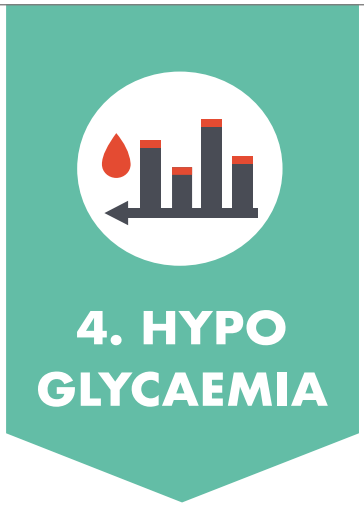
Appendix 2 Action Plan for Blood Glucose Level



* Personal Pupil Plan

Appendix 3 Additional information on the management of blood glucose levels

3a Hypoglycaemia

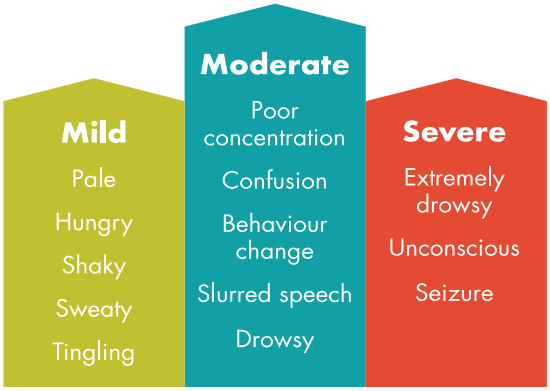


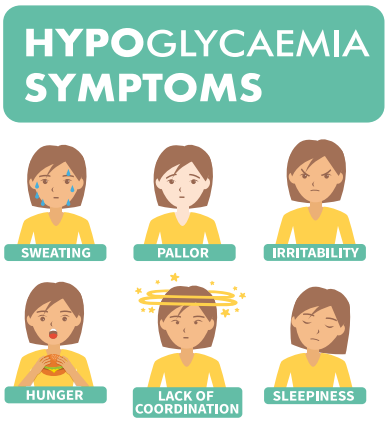
What is Hypoglycaemia?

Hypoglycaemia, also known as 'Hypo', is a low blood glucose reading less than 4mmols.

Symptoms

Hypos can be mild, moderate or severe.





Carbohydrate Table

Fast-acting Carbohydrates	Slow-acting Carbohydrates
10g 3 Dextrose tabs 100ml juice 100ml sugary drink 2 Jelly babies	**10g** 2 Crackers 1 Digestive
15g 5 Dextrose tabs 150ml juice 150ml sugary drink 3 Jelly babies	**20g** 4 Crackers 2 Digestives Small banana 1 slice of bread

Note: many drinks manufacturers are reducing the sugar content of their products. It is important to check your hypo remedy regularly to ensure carb content is appropriate.

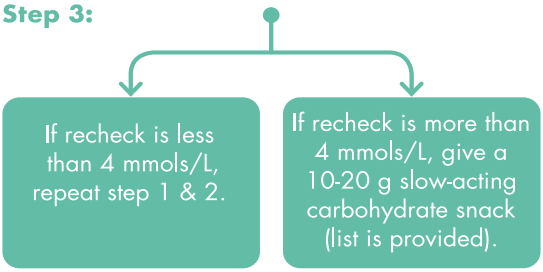
Treating Mild/ Moderate Hypo

(Blood Glucose less than 4 mmols/L)

Step 1:
Give 10-15g of fast acting carbohydrate.

Step 2:
Wait 10-15 minutes and then recheck blood glucose.

Step 3:



4.1 Hypoglycaemia

Glucogel

Glucogel *(10g per tube)* is a dextrose gel that is absorbed through the mucosa (skin inside the mouth). It may also be useful for treating a mild/moderate hypo if a child is uncooperative and refuses to drink *(toddler)* or has nausea/vomiting.

Glucogel should not be used if a child is unconscious as it may accidentally go down the windpipe. *(See severe hypo below).*

Additional Information

- Never leave a child alone during a hypo.
- Rest until blood glucose returns to normal.
- Record hypo and the possible cause, if known, in the diary.
- Get in touch with the diabetes team if hypos are recurring.

Treating Severe Hypo

If your child is very drowsy, very uncooperative or unconscious.

Step 1:

Put child in the recovery position.

Step 2:

Give glucagon injection.

- Children ≤ 6 years (or up to 25 kg) give 0.5 mg (half vial) of glucagon.
- Children > 6 years (or > 25 kg), give 1 mg (full vial) of glucagon.
- If you don't have glucagon or are not able to give it, phone for an ambulance immediately.

- **A severe low blood sugar is a medical emergency. If a child does not respond to the glucagon injection call an ambulance immediately.**

Step 3:

Give 10-15 grams of carbohydrate once child is conscious.

- Child may be nauseated for 20-30 mins following glucagon injection.

Step 4:

Contact the hospital diabetes team and go to the emergency department if your child has had a severe hypo. Call an ambulance if necessary.

HYPOGLYCAEMIA

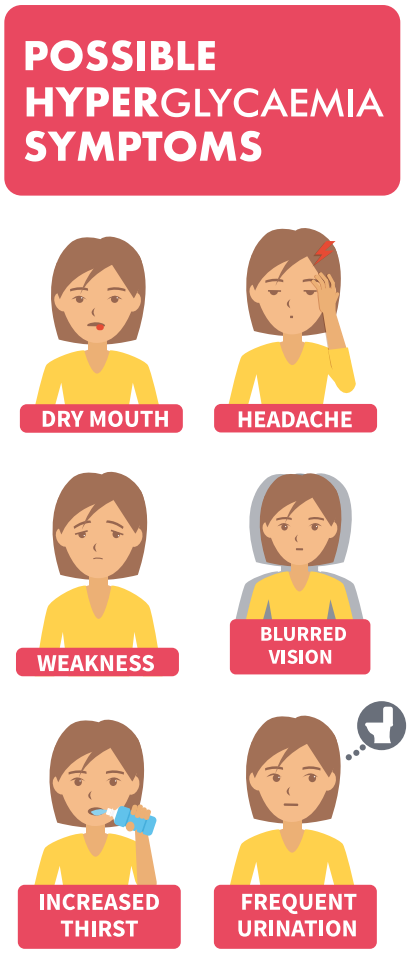
Causes and Actions to prevent:

Causes		Actions
Vomiting, Diarrhoea, no appetite etc.	 **Illness**	Monitor glucose levels more frequently. Reduce insulin doses. Follow sick day rules.
Possible error in insulin dose. Unsuitable carb ratio.	 **Insulin**	Adjust carb ratio/insulin dose if hypoglycaemia is reoccurring *(e.g. 1:10 to 1:12).*
Increase in level of activity. Did not adjust insulin or increase carbs before or after exercise.	 **Exercise**	Monitor blood glucose before and after exercise. Adjust insulin doses/carb intake accordingly.
Over estimation in carb content of meal. Did not finish a meal.	 **Food**	Check you are counting the carbs in the meals correctly. Use 'Carbs & Cals' app. If unsure about carb counting contact your dietitian.
Change of routine. Hot weather. Stress. Hot bath. Alcohol.	**Other**	Monitor blood glucose more frequently. *For information regarding alcohol see: www.askaboutalcohol.ie or www.diabetes.ie*

3b Hyperglycaemia

What is Hyperglycaemia?

Hyperglycaemia or high blood glucose is the term given to raised blood glucose levels. While target blood glucose is 4-8 mmol/L, when blood glucose is greater than 14 mmol/L additional steps are needed.



Hyperglycaemia

- Check blood ketones any time blood glucose is greater than 14 mmol/L or if your child is vomiting
- Drink plenty of water.
- Try to work out the cause of hyperglycaemia and take action to correct or prevent *(see table below)*.
- Record the reason for hyperglycaemia in your diary.

Sometimes hyperglycaemia may not cause any of the listed symptoms.

If you see a pattern of high blood glucose readings, discuss this with your diabetes team. The dose of insulin may need to be adjusted.

HYPERGLYCAEMIA

Possible causes and actions to prevent:

Causes		Actions
Infection. High temperatures.	 **Illness**	See your GP to find out cause. Give correction dose. Follow sick day rules.
Missed or insufficient insulin doses. Lumpy injection sites. Faulty equipment. Incorrect insulin storage.	 **Insulin**	Adjust carb ratio if hyperglycaemia is recurring (e.g. 1:10 to 1:8). Set reminders to avoid forgetting doses. Re-calcuate doses (carb ratio may need to be adjusted). Rotate injection sites. Check equipment.
Decrease in level of activity. Did not adjust insulin or carbs to cover exercise.	 **Exercise**	Monitor blood glucose before and after exercise. Adjust insulin doses/carb intake accordingly.
Under-estimation of carb content of meal. Reading labels incorrectly. Eating meals or snacks without insulin. Over-treating hypoglycaemia.	 **Food**	Learn the carb content of your meals and snacks. Use 'Carbs & Cals' app. If unsure about carb counting, contact your dietitian. Take insulin for all meals and snacks *(over 10g)*.
Change of routine. Stress.	**Other**	Monitor blood glucose more frequently.

If you have a lot of unexplained high blood glucose readings,
please discuss with your diabetes team as the insulin dose may need to be adjusted.

3c Blood Ketones

6. Ketones

Ketones: what are they?

When there is not enough insulin in the body, glucose cannot get into the cells to be used for energy. The body compensates by breaking down body fat for energy. The breakdown of fat produces a by-product called ketones. Ketones can be detected in the urine and the blood. A build-up of ketones can cause the blood to become acidic. A low level of ketones may not have much of an effect, but as the levels rise your child may feel unwell with abdominal pain and vomiting.

When ketone levels get very high *(greater than 2.5 mmol/L)* your child may become very unwell with *vomiting* and fast breathing. The term for this is diabetic ketoacidosis and this requires emergency medical treatment. If left untreated, it can be fatal. Early detection and management of rising ketones is important to prevent Diabetic Ketoacidosis *(DKA)*.

DIABETIC KETOACIDOSIS SYMPTOMS

ABDOMINAL PAIN

HIGH KETONE LEVELS

FAST BREATHING

VOMITING

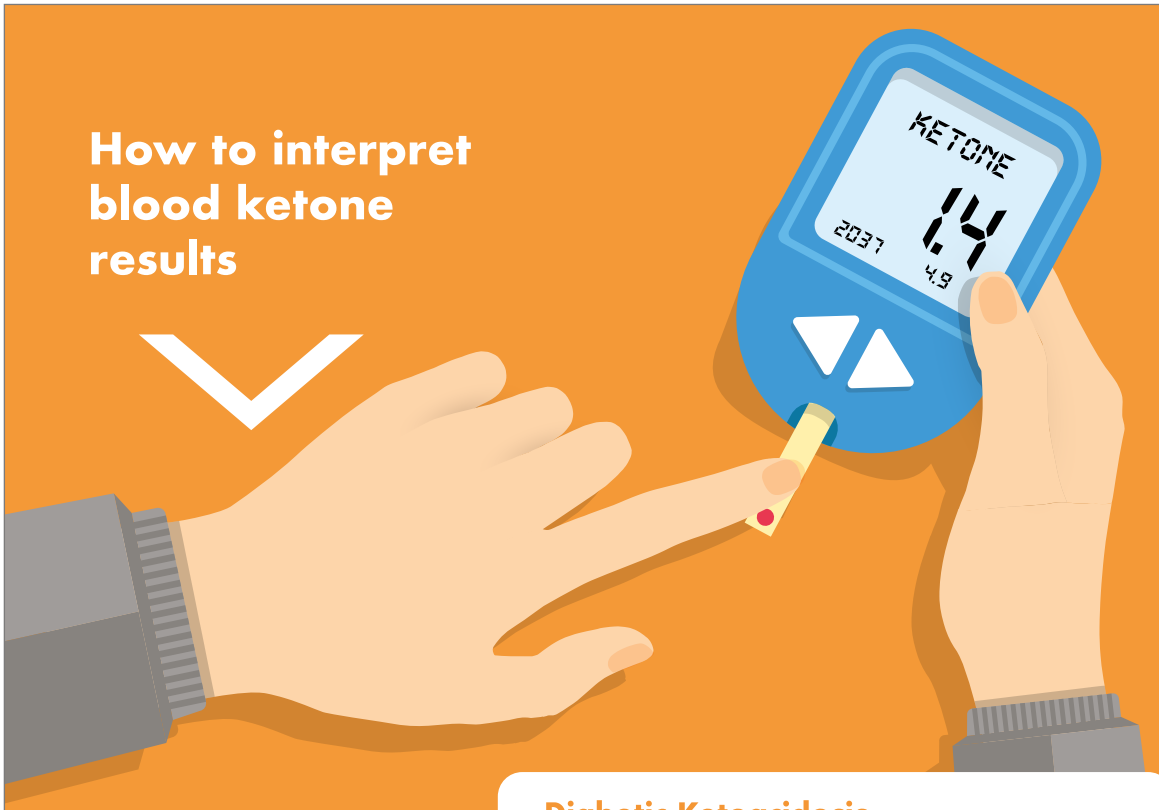
When to test for ketones:

- If your child is feeling sick, has tummy pain or is vomiting.
- If your child has a blood glucose level more than 14 mmol/L.
- If your child is breathing quickly.

What to do if ketones are present:

- Drink plenty of fluids to prevent dehydration.
- Give extra insulin as agreed with diabetes team - see sick day advice.
- Rest - do not exercise with high ketones.
- If ketone levels are very high or rising *(greater than 1.5 mmol/L)* you must call for medical advice immediately. Your child may need to come into the Emergency Department for assessment.

How to interpret blood ketone results



<0.6
(under 0.6 mmol/L):

May be normal; consider re-checking blood ketone levels in 1-2 hours if blood glucose remains elevated; above 13.9 mmol/L.

0.6-1.5
(between 0.6 - 1.5 mmol/L):

Indicates a need for extra insulin. It is important to telephone or follow the rules provided by your diabetes healthcare team and continue to check the blood glucose and blood ketone levels in 1-2 hours.

>1.5
(over 1.5 mmol/L):

Indicates risk of diabetic ketoacidosis. Call your child's health care team **WITHOUT DELAY** - it is likely that your child will need to be assessed in the emergency department.

Diabetic Ketoacidosis

DKA is a life-threatening condition which occurs when there is a build-up of ketones in the blood. DKA requires **urgent medical attention**.

Causes of DKA

- Sometimes present at time of new diagnosis of type 1 diabetes.
- Insufficient insulin or missed insulin dose.
- Illness.
- Equipment problems *(e.g. pen not delivering insulin, pump cannula blockage)*.

Signs and symptoms of DKA include:

- High blood glucose.
- High blood ketones *(more than 2.5 mmol/L)*.
- Dehydration.
- Abdominal Pain/Vomiting.
- Laboured or fast breathing.
- Sweet smelling breath.
- Drowsiness leading to coma *(late sign)*.

6.2 Ketones

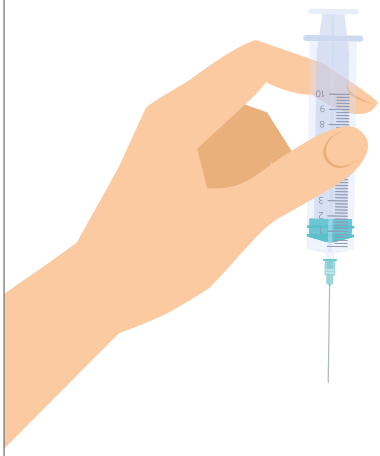
7. Sharps Disposal

Reasons to use sharps bin

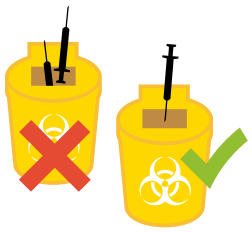
- Used syringes, needles and lancets can injure people.
- Used syringes, needles and lancets may carry infections such as hepatitis *(if a person is infected)*.

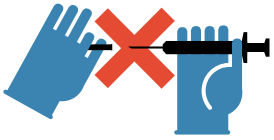
Please be responsible and dispose of sharps safely

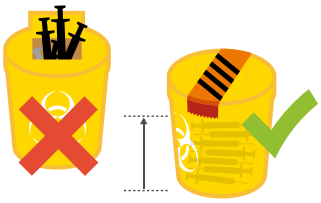
- A sharps container will be provided by the Diabetes Nurse when leaving the hospital at diagnosis. The Diabetes Nurse will demonstrate how to use it safely. Advice on safe disposal and replacements will also be provided.
- Replacements may be sourced from your local health centre, pharmacy or the clinic.
- When full, the sharps bin is returned to where it was sourced.
- If there are any difficulties in getting a supply of sharps containers, or returning full containers, please contact the Diabetes Nurses who can advise.



7.1 Sharps Disposal







DO'S & DON'TS

Be smart with your sharps

	Do:	Don't:
Dispose of used syringes, needles and lancets.	✓	
Do use the temporary closure lid to avoid accidental injury.	✓	
Do keep the container out of reach from young children.	✓	
When the bin is full, close the lid until it clicks shut. Now it is locked and cannot be opened again.	✓	
Make sure a spare sharps container is available before the current one is full.	✓	
Do dispose of fully locked sharps container correctly by returning it with the outside clean, to where it was supplied.	✓	
Don't put used needles into any other containers, e.g. plastic food boxes.		✓
Don't re-cap used needles, syringes or lancets.		✓
Don't put any other waste in the sharps container. It should only have syringes needles and lancets.		✓
Don't put the container into normal household rubbish as it could cause injury.		✓
Don't try to remove a needle once placed in the sharps container.		✓
Don't fill the container past the fill line because needles may begin to stick through the plastic wall and cause an injury to someone.		✓

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10 Document Approval Process

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