DIABETES in Children: NON-EMERGENCY PRESENTATION

1. **DIAGNOSIS** must be unequivocal

(a) Classical history of - **polyuria** (usually nocturia ± enuresis)
- polydipsia
± weight loss

(b) **Glycosuria** (on more than one occasion) > 2%

(c) **Blood Glucose (BG)** > 11 mmol/l

(Beware the rare occurrence of transient stress hyperglycaemia & glycosuria as well as steroid induced hyperglycaemia usually without the classical symptoms)

2. **ADDITIONAL INVESTIGATIONS (VENOUS BLOOD)**
FBC, HbA1c, U/E, FT4, TSH, Blood Gas, Thyroid antibodies, coeliac screen, GAD antibodies, Islet cell antibodies, and insulin antibodies.

3. **EXPLAIN** to parents and child briefly and in simple terms

Diagnosis - The high blood sugar (glucose) and heavy urine sugar are simple tests but they confirm the diagnosis of diabetes.

Excessive urination (Polyuria) - Passing lots of sugar (glucose) in the urine. The word 'diabetes' means 'a fountain' or a passing through of much sugar in the urine - the child has been 'like a fountain' recently.

Thirst - High sugar in blood causes excessive urination which then cause thirst.

High blood sugar - Due to insulin deficiency. Insulin controls blood glucose levels Pancreas gland is not producing enough insulin.

Pancreas failure – "Self-destruction" of the islet cells of the pancreas, causing insulin deficiency and poor sugar control

Why? - Uncertain but some inherited predisposition plus trigger factors we do not understand.

How often? - About 1 in 1,000 younger school children and 1in 500 secondary school children

Is it serious? - Yes it is a serious condition which cannot be cured but we can treat diabetes very effectively so that your child will remain extremely healthy and be able to take part in all activities of daily living.

Requirements - The best and only treatment (unfortunately) is by **insulin by injection** but this will reverse the symptoms very quickly and your child will improve dramatically over the next few days.

4. EXPLAIN THE NEED TO START INSULIN TODAY: to prevent progress to DKA and they are to be congratulated in recognising the symptoms of diabetes early before dehydration etc has occurred

5. MANAGEMENT OF THE 1ST INJECTION

The first injection is the most important in the child's life.

If the child is well, the first injection can wait for the next meal (breakfast/tea) and give injection as suggested below. If the child is over 11 years and during working hours, please contact the diabetes team who will make the decision if the child can be started on multiple daily insulin (MDI) regime and so needs to have Novorapid with any meal (Breakfast/dinner/tea).

Injection should be given using an insulin syringe and needle at diagnosis. Some of these children may be able to use pen device and our paediatric specialist diabetes nurses' (PDSNs) will organise this at a later date.

THE CHILD SHOULD ONLY GO HOME IF CONTACT IS MADE WITH EITHER OF THE DIABETES CONSULTANTS OR ONE OF THE PDSN's (SEE BELOW) AND CLEAR ARRANGEMENTS MADE FOR THE FOLLOWING MORNING (EITHER AT HOME OR IN THE WARD)

If such contact is not assured it would be advisable to keep the child in hospital for a day or two for education and support, and to show the blood glucose decreasing successfully.

6. Make sure that early contact is made with one of the PDSN's and Specialist Dietitian (see below).

7. CARBOHYDRATE INTAKE

After injecting insulin it is particularly important to emphasise the need for some carbohydrate intake either as the next meal or in the evening, particularly supper before going to bed to prevent hypoglycaemia.

8. INSULIN REGIME

Weight < 30kg - 0.2 u/kg/dose Insulatard am, 0.1 u/kg/dose Insulatard pm
Weight > 30kg – 0.4 u/kg/dose Mixtard 30/70 am, 0.2 u/kg/dose Mixtard 30/70 pm

- Multiple daily insulin (MDI) with Insulin Glargine/Levemir and Novorapid (after consultation with the diabetes team). If out-of-hours and unable to contact, start Mixtard 30 or Insulatard as above and inform diabetes team when suitable
- Glargine/Levemir - 0.3 units/kg/day once daily
  Novorapid – approximately 1 unit per 10 gram Carbohydrate (to be agreed with Dietitian)

9. Monitoring BG levels

Initially we would advise 4 or 5 BG levels (pre meals, prebed) per 24 hours to assess the efficacy of the insulin treatment.

Write down all BG results from the beginning in a **monitoring diary** to demonstrate to the child and family the monitoring process and the changes in BG. Additionally, on the ward , BG results will be written down in the nursing notes.

The BG monitor which we use at present is the **Medisense Optium monitor** using the Medisense Optium Blood testing strips (from the PDSN's supply or ward supply).

NB. Do not be worried about general level of hyperglycaemia initially. A gradual increment in insulin doses will enable control to be gained over the next few days. There is no great urgency.

Ketone testing - Although most children have ketones in the urine at onset, subsequent testing is not terribly helpful or important. The most important aspect is teaching the parents and child to understand normal BG levels and how insulin gradually decreases glucose towards the normal range.

Small additional doses of **NovoRapid** (analogue rapid acting insulin) may be given at any time before 10 pm if BG is above 15, 17 or 20 mmol/l but this depends very much on the age of the child (see algorithm we give to parents to use). Remember to test the BG 2 hours after the dose of Novorapid. In the event of persistent hyperglycaemia (BG > 15 mmol/l), Novorapid can be repeated every 2 hours.

Algorithm: Extra NovoRapid for hyperglycaemia

AGE	BG 14+	BG 17+	BG 20+
Less than 7 years	0.5-1 units	1-2 units	2-3 units
7-11 years	2-3 units	3-4 units	4-5 units
12-14 years	3-4 units	4-5 units	5-6 units
15-18 years	4-5 units	6-8 units	8-12 units

10. Further educational sessions

(a) Talk about the **balance** between insulin, food and exercise

(b) The aim of keeping the majority of BG tests to less than 10 mmol/l 'in single figures whenever possible' is to prevent complications in later life.

(c) Talk briefly about mild **hypoglycaemia** (BG drops below 4 mmol/l) which may cause symptoms such as trembling, hunger, excessive sweating,etc which can be self treated.

(d) **Never stop insulin**: **always carry sugar** eg Dextrosol tablets.

11. DISCHARGE FROM HOSPITAL & FOLLOW-UP

The timing of discharge will depend very much upon the involvement of the PDSN's and the Dietitian and their availability to continue the education and management in the home setting. In making this decision please discuss with one of the PDSN's (see below).

Please ensure an appointment is made for the child to attend the thursday diabetes clinic within the first week of diagnosis. This can be arranged by contacting the diabetes clinic coordinator (Ext 6225) and giving the child's name and details.

12. MEDICATION, EQUIPMENT & INFORMATION to be made available to parents and children before discharge.

NB Try to write up the Pharmacy prescriptions (TTOs) at the earliest indication child may be discharged home.

Pharmacy supplies to take home

1) INSULINS –

NOVORAPID (FOR EVERY CHILD)- 3 mls penfill cartridges x 1 box

HUMAN MIXTARD 30 – 3 mls penfill cartridge x 1 box
OR
HUMAN INSULATARD - 3 mls penfill cartridge x 1 box
OR
INSULIN GLARGINE/LEVEMIR - 3 mls penfill cartridge x 1 box (as appropriate)

2) **GLUCAGON** -
1 mg vial "Glucogen Novonordisk" for emergency use (dose 0.3 mg for the 0-5 year olds; 0.5mg for 6-11 year olds; 1.0mg for >11years)

3) **GLUCOGEL** formally known as **HYPOSTOP** - one triple pack for emergency use

Treatment and monitoring equipment from ward stock or PDSN -

(a) Syringes – one/two packets Becton-Dickinson 0.3 ml. with 8mm needles
(b) Medisense Optium Monitor (also includes a finger pricking device and lancet which needs to be provided)
(c) Medisense Optium blood testing strips
(c) Monitoring (test) diary

Refer to the yellow diabetes information folder for more details on these.

(C) Information

(a) Information booklet entitled 'Diabetes - A Book for Children and Their Parents'
(b) Details of local Diabetes UK Parents' Group (on information card)
(c) Dietary advice sheets
(d) Other information sheets may be available in the diabetes cupboards or PDSN's office.

(D)To obtain from GP (PDSN will complete a GP prescription)

(a) Safe clip (Becton-Dickinson)
(b) Spare insulins, syringes, lancets and BG monitoring sticks
(c) Spare glucagon and glucogel
(d) Sharps bin

URGENT CONTACTS

1. **Consultants – Dr James Greening/ Dr Savitha Shenoy – Ext 6222/ Airpage via switchboard**

2. Paediatric Diabetic Specialist Nurses (PDSN's)

   Specialist Nurses Office 0116 258 6796 (08.30 am to 4.30 pm – answer message available)
   Jo Erez 07921545406
   Julie Phillips
   Elaine Hartshorn 07921545638
   Tina Woodford 07921545407
   Debbie Carlyle 07921545529

3. Children's Specialist Diabetes Dietitian: Emma Marcus - 07789926868

LET DIABETES CONSULTANTS KNOW AS SOON AS THEY ARE AVAILABLE TO SEE THE CHILD AND PARENTS

Previous version: Dr S Shenoy, Dr J Greening 2007

Current Version: Dr Carrihill, Dr Greening 2008

Acknowledgements; Paediatric diabetic nurses and Dietitians

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