Guidelines for the management of the newly diagnosed patient with diabetes not in DKA

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See also: Guidelines for the management of diabetic ketoacidosis (DKA)

These are general guidelines. They may be altered to suit individual situations.

All newly diagnosed Type 1 diabetes patients MUST be discussed with a member of the Diabetes team within 24 hours of diagnosis.

Contact the diabetes team using numbers below (leave a message and a member of the team will call you back within an hour):

- **In hours – telephone ext. 63140**
- **Out of hours – via switchboard on call rota**

Please note this is not an emergency service. It may take **up to an hour** to call back.
Please be patient.

DIAGNOSIS:

Hyperglycaemic crisis: Plasma glucose concentration ≥ 11.1 mmol/L or fasting plasma glucose ≥ 7.0 mmol/L. Fasting is defined as no caloric intake for at least 8hrs
+/-
Ketonaemia (capillary blood Ketones >0.6 mmol/l)
+/-
Classic symptoms of diabetes: (Polyuria, Polydipsia, enuresis, weight loss and generally unwell, susceptibility to infections, polyphagia)

PLEASE NOTE IF the child is unwell and:

- pH <7.3 or Bicarbonate < 15 mmol
- Ketonaemia or ketonuria (capillary blood Ketones >0.6 mmol/l or urine ketones ≥2+)
- Hyperglycaemia (blood glucose > 11.1 mmol)
- Dehydration
- ± Vomiting
- ± Drowsiness

Please refer to the DKA management guideline available on Microguide
(Paediatrics & Neonatology > Paediatrics > D)

- The majority of newly diagnosed patients Type 1 DM will present well. Children who are alert, not clinically dehydrated, not nauseated or vomiting do not always require IV fluids, **even if their ketone levels are high**. They usually tolerate oral rehydration and subcutaneous insulin but do require monitoring regularly to ensure that they are improving and their ketone levels are falling

- In newly diagnosed patients with DM the purpose of the initial contact is to initiate subcutaneous insulin therapy and educate patient and family (empowering them to care for diabetes at home). As it is the first of many contacts, it is important that it is a positive one. Discharge will be planned in conjunction with the diabetes team.

- The diagnosis of diabetes should not be based on a single plasma glucose concentration. If the diagnosis is in doubt, continued observation with fasting and/or 1h postprandial blood glucose levels for the next 12-24 hours will be helpful.

- Hyperglycaemia detected under conditions of stress, such as acute infection, trauma, surgery, respiratory distress, circulatory, or other stress may be transitory and may or may not require treatment, but should **not** in itself be regarded as diagnostic of diabetes

- A formal plasma glucose measurement is required to confirm the diagnosis; this should be based on laboratory glucose oxidase estimation rather than a capillary blood glucose monitor.

1. Initial clerking:
   - Full History including family history and social history
   - Examination
   - Height, weight centiles
   - Blood pressure

2. Urine:
   - Urinalysis for Glucose and Ketones
   - Urine for microscopy, culture and sensitivity - if symptoms of UTI or leucocyte/nitrite positive

3. Venous blood sample:
   - Cap blood glucose and Ketones (CED Blood and Ketone Meter)
   - Glucose for lab as well.
   - HbA1c
   - FBC, U+E and Plasma Osmolality
   - TFT, coeliac screen (tissue transglutaminase antibodies), IgA levels.
   - GAD 65 antibodies, IA2 antibodies, ZnT8 antibodies and Islet cell antibodies
   - Blood-cultures and CRP if pyrexia
   - Venous or capillary Blood gas analysis - if ketotic
   - Research bloods, if any

4. Other investigations if indicated:
   - CXR
   - Swabs (throat, genital, wound etc.)
   - Viral studies (blood, urine, throat, stool etc.)

5. **Subcutaneous Insulin Therapy**:

   Please discuss with Registrar on call or diabetes team.

   Please discuss with the diabetes team (contact the OOH Diabetes Clinician via switchboard as needed). Confirmation of the following plan is required, as according to individual patients this may vary slightly from guidelines.

   - The initial total daily dose is best estimated at 0.5 units/kg/day.

   - Please use MDI (multiple daily injections) - basal bolus regimen for all patients regardless of age as the preferred insulin regimen.

MDI regimen

- start basal bolus regimen (4 injection regimen) utilising NOVORAPID before each meal and LEVEMIR usually given at the same time every day at bedtime.

  NOVORAPID doses are generally estimated at **0.1 unit/kg** for each meal (with some variation) and LEVEMIR dose at **0.2 units/kg**.

  There is no need for mid-morning and mid-afternoon snacks with this insulin regimen.

- Start with (pre meal) subcutaneous fast acting insulin (e.g. Novorapid) at a convenient meal. Leave IV cannula in situ in case diet and fluids are not tolerated. If possible consider going straight from IV insulin to child's usual regimen.

- Give subcutaneous fast acting insulin (Novorapid) up to 5 minutes before the meal and stop IV insulin 30 minutes after the first s/c injection of insulin (Novorapid) to prevent rebound hyperglycaemia.

- A guide to approximate dose (rounded to the nearest 0.5 units) of insulin (Novorapid) with meals, based on pre-meal blood glucose levels is as follows:

  - Pre meal BM <10 – mealtime insulin 0.1 unit/kg + no additional correction
  - Pre meal BM 10.1-17 – mealtime insulin of 0.1 unit/kg + additional correction of 0.02 units/kg
  - Pre meal BM 17.1-24 – mealtime insulin of 0.1 unit/kg + additional correction of 0.04 units/kg
  - Pre meal BM >24.1 – mealtime insulin of 0.1 unit/kg + additional correction of 0.06 units/kg

  NB: Children should be ketone free for at least 24 hours if they are to recommence CSII pump

- The insulin dose needs to be reviewed at least daily.

- Consider extra dose of fast acting insulin if blood sugar >14 with or without ketones. Additional fast acting insulin for high glucose >14mmol/L (+/- Ketones >0.6mmol/L) is approximately another 0.02 units/kg (rounded to the nearest 0.5 units) on a 2 hourly basis if required

- Make sure corrections of SC insulin are NEVER given closer than 2 HRS apart

- For children <15 kg in weight requiring only 0.02 units/kg correction doses outside of meal times please discuss with the diabetes team if rounding to the nearest 0.5 units is appropriate and if corrections are necessary outside of meal times

- Do not advise exercise if blood sugars high with ketonuria.

6. Blood glucose and blood Ketone monitoring

- This should be done by Blood Glucose using the CED glucose meter and blood Ketone testing using the CED Ketone meter
- Blood Glucose testing is necessary before all 3 main meals of the day and at bedtime as a minimum, but may need to be hourly or 2-hourly immediately after presentation or if other insulin has been given.
- Please measure blood glucose after 2 hrs of giving an extra dose of fast acting insulin Novorapid (CORRECTION DOSE) to check this has been beneficial
- If a correction dose of Novorapid insulin has been given for high ketones, then please check blood ketones after 2hrs from the correction.

7. Discharge

The aim of this first contact is to get the child and the family home as soon as they have been educated and feel confident with insulin injections, blood testing, dietary and hypoglycaemic management. All other aspects of management can be done gradually later after discharge. This usually takes a day or two, but will vary with the family. Plans for discharge should be made in conjunction with the Diabetes Specialist Nurse, who will be in frequent contact with the family when they go home. Please ensure that the family have emergency contact numbers in case they have queries. Please ensure the GP is informed of child's diagnosis, discharge and treatment.