

Guideline for the management of diabetes for adults (≥ 16 years of age) receiving enteral feeding in hospital

1. Introduction

The majority of patients with diabetes experience a rise in their blood glucose levels when they commence enteral feeding. This is often due to other factors such as recent surgery or infection and poor blood glucose control may complicate their underlying medical condition and delay recovery. To maintain optimal glycaemic control while ill and receiving enteral nutrition, patients usually require alteration of their usual diabetes treatment. It is imperative that there is good communication between the ward nursing staff, Medical Teams, Nutrition Nurse, Specialist Nurses, Dietitian and Clinical Pharmacist.

The guidelines are for all staff involved in the care delivery of patients admitted to the hospitals within NHS Ayrshire and Arran requiring management of diabetes whilst receiving enteral feeding.

These guidelines are aimed at patients who:

- Have pre-existing diabetes and require enteral feeding to control blood glucose levels.
- Develop hyperglycaemia while being enterally fed.
- Are currently on enteral feeding and intravenous insulin and are being transferred to subcutaneous (sc) insulin.

2. Target Glycaemic Control.

- For patients being enterally fed, extremes of glycaemic control should be avoided.
- A target blood glucose reading should be **between 6 and 12 mmol/l**. These targets should be adjusted according to individual patient requirements.
- All patients with type 1 diabetes should have their urine checked for ketones daily and daily laboratory glucose and lactate checked.

3. Diabetes Therapy - Oral hypoglycaemic agents (OHA)

- OHAs often provide inadequate glycaemic control, and therefore in some patients they should be converted to insulin and the OHA discontinued.
- A small number of patients on OHA may not require insulin therapy. Although unlicensed for this form of administration, tablets such as gliclazide may be administered via the enteral feeding tube. Due to this administration being unlicensed discussion should take place with the clinical pharmacist, medical staff and instructions followed. Refer to [Code of Practice for Medicines Governance section 9b "off-label" use of medicines](#).
- Metformin should not be used in patients who are systemically unwell or who have renal or hepatic impairment.

4. Intravenous Insulin sliding scale

The usual therapy of choice is insulin, initially via an Intravenous Sliding Scale. Please refer to the [Insulin Sliding Scale guideline](#) for further information.

5. Maintaining glycaemia control

- If the feed stops unexpectedly, blood glucose levels should be closely monitored, as patients are at risk of hypoglycaemia. If necessary, an intravenous Glucose infusion should be commenced until feeding can be resumed.
- If feed is stopped electively the patient may require recommencing intravenous insulin and glucose (GKI) as per the [GKI guidelines](#).
- Glycaemic control should be closely monitored and insulin doses should be adjusted accordingly. If a patient on enteral nutrition becomes hyperglycaemic, then the diabetes medication needs adjusting, rather than a reduction in nutrition.
- As the patient's clinical condition improves and their activity levels increase, insulin requirements may reduce significantly. If the patient comes off enteral feeding and returns to normal eating, they should usually return to their pre-illness diabetes regimen.
- If further advice is required please contact the Ward Dietitian/Diabetes Team/ Clinical Pharmacist / Medicines Information / Medical Staff. Advice can often be given over the telephone.

6. Conversion to subcutaneous insulin therapy based on feeding regimes

Once the patient's blood glucose is stabilised and feeding has been established, he / she should be converted to subcutaneous insulin injections. Subcutaneous insulin dose can be calculated as follows:

- Take an average of the patients 24 hour intravenous insulin requirements from the intravenous sliding scale.
- Subtract 25% from this value and this will be their **TOTAL DAILY SUBCUTANEOUS INSULIN DOSE**.
- This will usually be split into 2 or more injections.

Insulin doses should be increased prospectively not retrospectively i.e. **avoid administering doses of short acting insulin**.

For in-patients with diabetes, the enteral feeding regimen will be recommended and prescribed by the dietitian to meet the individual's nutritional requirements. To maximise glycaemic control, the following feeding regimens are recommended:

6.1 Intermittent Feeding:

- a) This may commence at varying times and be of variable duration (minimum 12 hours, maximum 20 hours).
- b) Calculate the total daily insulin subcutaneous dose as above. (i.e. average 24 hour intravenous requirements minus 25%).
- c) Administer 2/3 of the subcutaneous insulin dose as pre-mixed 30/70 insulin (either Humulin M3® or NovoMix 30®) at the start of the feed.
- d) The intravenous insulin should be discontinued 1 hour after the initial first subcutaneous insulin dose has been administered.

- e) Administer the remaining 1/3 of the subcutaneous dose as isophane (either Humulin I® or Insulatard®) at 12 hours.
- f) If patient on a basal bolus insulin regimen (i.e. Humalog®, NovoRapid® or Apidra® three times a day and Lantus®, Abasaglar® or Levemir® once a day) or a once daily long-acting insulin analogue (e.g. Lantus®, Abasaglar® or Levemir®), change to once a day pre-mixed 30/70 insulin plus once a day isophane insulin and follow the instructions as above
- g) If a patient is on the multi-injection regimen and advice is needed, please contact the Diabetes Specialist Nurses

6.2 Bolus feeding (administering feed at once via a syringe): –

- a) The feed is divided into at least 4 boluses, ensuring the carbohydrate intake is evenly distributed throughout the day, to mimic breakfast, lunch, dinner, supper and between meal snacks.
- b) Calculate the total daily insulin subcutaneous dose as above. (i.e. average 24 hour intravenous requirements minus 25%).
- c) Administer 2/3 of the subcutaneous insulin dose as pre-mixed 30/70 insulin (either Humulin M3® or NovoMix 30®) before the breakfast bolus.
- d) The intravenous insulin should be discontinued 1 hour after the initial first subcutaneous insulin dose has been administered.
- e) Administer the remaining 1/3 of the subcutaneous dose as a pre-mixed 30/70 insulin (either Humulin M3® or NovoMix 30®) around 9-10 hours later before the dinner bolus feed.
- f) If patient on a basal bolus insulin regimen (i.e. Humalog®, NovoRapid® or Apidra® three times a day and Lantus®, Abasaglar® or Levemir® once a day) or a once daily long-acting insulin analogue (e.g. Lantus®, Abasaglar® or Levemir®), change to twice a day pre-mixed 30/70 insulin and follow the instructions as above
- g) If a patient is on the multi-injection regimen and advice is needed, please contact the Diabetes Specialist Nurses

7. Hypoglycaemia

- Hypoglycaemia is a medical emergency and should be treated urgently. Refer to [ADTC 205: Algorithm for the treatment and management of hypoglycaemia in adults with diabetes mellitus in hospital.](#)

Adapted from NHS Greater Glasgow & Clyde Management of Diabetes for People Receiving Enteral Feeding in Hospital. Available from:
<http://handbook.ggcmedicines.org.uk/guidelines/endocrine-system/management-of-diabetes-for-people-receiving-enteral-feeding-in-hospital/> (accessed 7th June 2018)