THINKGLUCOSE™
Inpatient care for people with diabetes

NHS
York Teaching Hospital
NHS Foundation Trust

Best Practice Guidelines : Main Principles of Diabetes Care at End of Life

These principles and the algorithm have been devised for patients with diabetes to aid provision of a painless and symptom free death. The principles are an explanation as to why diabetes care remains important in the last days of life

1. To avoid metabolic de-compensation and diabetes related emergencies such as
   - Diabetic ketoacidosis (DKA)
   - Hyperosmolar hyperglycaemic state (HHS)
   - Persistent symptomatic hyperglycaemia
   - Frequent and unnecessary hypoglycaemia

2. Avoidance of symptomatic clinical dehydration

3. To provide an appropriate level of intervention according to stage of illness, symptoms and respect for dignity.

Taken in part from End of Life Care: Full Strategy Document. Diabetes UK. 2nd Ed. Oct 2013

- Patients with Type 1 diabetes must not have their insulin stopped (see points 1 & 2.) Reductions to insulin may be required or a change to different insulin could be more appropriate.

- The majority of patients with Type 2 diabetes who are treated with insulin may not need insulin in the last days of life. A daily capillary blood glucose reading should be carried out to assess glycaemic control and insulin regime.

- Patients with diabetes who are on Corticosteroids will also need blood glucose monitoring, as steroids increase insulin resistance and lead to worsening hyperglycaemia and hypoglycaemia symptoms (see Best Practice Guidance for the Use of Insulin Administration During Glucocorticoid (Steroids Therapy).

Last days of life Diabetes Care Management Algorithm

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Discuss changing the approach to diabetes management with patient and/or family if not already explored. If the patient remains on insulin, ensure the diabetes specialist nurses are involved and agree with the monitoring strategy.

Type 2 diabetes controlled with diet or metformin

→ Stop monitoring blood glucose

Type 2 diabetes on other tablets and/or insulin or glucagon-like peptide-1 (GLP-1) agonist ❶

→ Stop tablets and GLP-1 injections. Consider stopping insulin if insulin requirement ≤10 units

If insulin stopped:

- Check capillary blood glucose (CBG) once a day at teatime
- If CBG over 20mmol/L give 4 units of short acting insulin ❷
- Re check CBG after 2 hours

→ If patient requires short acting insulin ❷ more than twice, consider daily isophane insulin ❸ or insulin glargine (Lantus)

If insulin to continue:

- Either prescribe once daily morning dose of isophane insulin ❸
  Or
- Long acting insulin glargine (Lantus)

(Based on 25% less than total previous daily insulin dose)

Type 1 diabetes always on insulin

Continue on current background (long acting) insulin or usual insulin if pt requests this with reduction in dose by 25%

If patient on twice daily mixed insulin:

- Either prescribe once daily morning dose of Isophane insulin ❸
  Or
- Long acting insulin glargine (Lantus)

(Based on 25% less than total daily insulin dose)

Check capillary blood glucose once a day at teatime:

- If <8mmol/l reduce insulin by 10 to 20%
- If >20mmol/l Increase insulin by 10 to 20% to reduce risk of symptoms or ketosis

KEY

❶ Byetta (Exenatide)
Victoza, (Liraglutide)
Lyxumia (Lixisenatide)
Trulicity (Dulaglutide)
Bydureon (Exenatide prolonged release)

❷	Novorapid Apidra Humalog	Peak 1 to 2 hours Duration 3 to 5 hours Onset 5 to 15 mins
	Actrapid	Onset 30 to 45 mins Peak 2 to 4 hours Duration 6 to 8 hours
❸	Insulatard Humulin I	Peak 4 to 8 hours Onset 2 hours

- Keep tests to a minimum. It may be necessary to perform some tests to ensure unpleasant symptoms do not occur due to low or high blood glucose.
- It is difficult to identify symptoms due to hypoglycaemia or hyperglycaemia in a dying patient.
- If symptoms are observed, it could be due to abnormal blood glucose levels.
- Test urine or blood for glucose if the patient is symptomatic.
- Observe for symptoms in previously insulin-treated patients where insulin has been discontinued.
- Insulin ❷ & ❸ in Key are in order of preference.

For queries relating to the diabetes flowchart please contact York Hospital Support 01904 726091 York Community Support 01904 724938 and in Scarborough 01723 342274

For queries relating to palliative care please contact the Palliative Care Team

For more information see **Best Practice Guidelines on Staff Room**

Adapted from End of Life Diabetes care: Clinical care recommendations 2nd edition
Author: Think Glucose and Anne Garry, Palliative Care. Owner: Think Glucose. Version 3.
Date for review Jan 2020

Glucose control target ranges in last days of life:

- **Aim 1** –
  No glucose level
  less than 6 mmol/l
- **Aim 2** –
  No glucose level
  higher than 15 mml/l

Hypoglycaemia management

Hypoglycaemia can be troublesome at any time in patients with diabetes on glucose lowering therapies at end of life. Every effort should be made to avoid these side effects of treatment.

The following help to reduce hypoglycaemia:

- Agree a care plan and glucose target
- Be cautious when anorexia develops
- Tailor insulin therapy and avoid insulin dose error

Identifying patients at risk of hypoglycaemia:

Those who are on insulin, sulphonylureas (eg Gliclaizide, glipizide, glimepiride) and prandial regulators users (Nataglinde, Repaglinide)

Patients who are at particular high risk include those who also have one or more of the following:

- Poor appetite/erratic eating patterns
- Weight loss
- Renal deteriation
- Liver impairment/carcinoma

All hypoglycaemia episodes must be treated as per Trust Guidelines.

After an episode of hypoglycaemia:

Consider discontinuing insulin (unless Type 1 diabetes) or reducing insulin or oral hypoglycaemia agents.
Review management plan with patient and relatives to clarify/confirm goals of diabetes management for their stage of life.

Withdrawal of Treatment

Multiple factors may influence this process:

- Patient's wishes
- Dealing with concerns by family of a 'euthanasia' approach
- Advance decision to refuse treatment
- Intravenous/subcutaneous fluid or nasogastric feeding may be warranted for a brief spell
- Close liaison with the patient, family and GP is warranted in this scenario.

Withdrawal of part or whole of diabetes related treatment can be considered under the following:

1. When the patient is last hours of life
2. Where frequent treatment-related hypoglycaemia is causing distress and significant management difficulties
3. Where continued treatment with insulin poses an unacceptable risk of hypoglycaemia or where the benefits of stricter glucose control cannot be justified
4. Where the tablet burden and side effects of blood pressure tablets and lipid lowering therapy outweigh any long-term benefit
5. Where continued food or fluids is not the choice of the patient
6. Where prescribing anti-infective therapy is not likely to benefit the patient

Case Study one

Peter is a 67yr old gentleman who lives with his wife. He has had type 2 diabetes for 10 years and is treated with Metformin 1g BD and Gliclazide 80mg BD. Peter has been started on once daily prednisolone 30mg AM and he has noted his blood glucose are running a little higher between 14-19mmols throughout the day, however his pre bed and pre breakfast readings are still within range running 6-10mmols. Peter called his Diabetes Specialist Nurse (DSN) who suggested increasing his AM gliclazide dose to 160mg AM, to reduce his daytime glucose reading. The DSN educated Peter on steroid induced hyperglycaemia, explaining that blood glucose levels normally peak pre tea time after taking steroids in the morning and the importance of reducing his gliclazide back if his steroids are reduced / stopped.

Case Study two

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David was diagnosed with type 1 diabetes at the age of 52yrs. He has coped with his diabetes during his chemotherapy and radiotherapy but admitted to his Macmillan Nurse that he is struggling. He is eating only small amounts and is having difficulty balancing his 4 times a day insulin regimen and he is experiencing a number of hypoglycaemic episodes.
The Macmillan Nurse calls the Diabetes Specialist nurse for advice.
David is in the last weeks of life and has a limited appetite, aiming for his previous good control was unrealistic so she and David agreed different targets of 6-16 mmol/l. Simplifying his insulin regimen to avoid the risk of keto-acidosis, he is to stop his meal time (fast acting) insulin and to continue on his background (long acting) insulin with a reduction in his dose by 25%. Doing this meant he could reduce his home blood glucose testing too.

Case Study three

Ruth has type 2 diabetes and is cared for in a residential home following deterioration in her dementia. She is admitted to the Admission Ward following deterioration. The carers had reported that Ruth has been struggling to take her oral medication (metformin) over the last couple of weeks prior to admission.
On reviewing her glucose control she is running within target between 6-14mmols and she has been put NMB while awaiting Speech and language review.
Our aim for Ruth is to keep her symptom free with minimal monitoring.
As her blood glucose are within range on no diabetes medication at present. The ward doctor appropriately suggests continuing on no diabetes treatment and to stop blood glucose monitoring. Staff were to observe for signs of hyperglycaemia and to only start blood glucose monitoring if staff feel she has become symptomatic.

Author: Think Glucose. Owner: Think Glucose, Version 2 Date Approved: Oct 2018, Approved by: Think Glucose and Patient Safety Team, Date for review: Oct 2021