

## DIABETES (MANAGEMENT AT END OF LIFE) GUIDELINES

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<b>TARGET AUDIENCE</b>		
<b>People who need to know this document in detail</b>	<b>People who need broad understanding of this document</b>	<b>People who need to know this document exists</b>
Doctors Registered nurses	All nursing staff	All clinical staff

## 1. Introduction

Diabetes mellitus is a disease caused by deficiency or reduced effectiveness of endogenous insulin. It is characterized by persistent hyperglycaemia, abnormal metabolism of glucose and has sequelae predominantly affecting the vasculature. It's prevalence in the UK is 3-5% of the population (pan Birmingham).

There are 2 main types of diabetes, type 1 is caused by a failure to produce insulin and type 2 is caused by insulin resistance. It is very important to identify patients with diabetes and to ascertain which type the patient has. A patient within a palliative care setting can have diabetes secondary to their illness or treatments. In particular, treatment with corticosteroids can worsen glycaemic control in known diabetics and can precipitate diabetes in a patient not previously diagnosed. In addition, changes in general condition such as dietary intake and weight loss can affect their glycaemic control.

## 2. Scope of guidelines

The aim of these guidelines is to make explicit the aims of care and to provide instructions for the appropriate frequency of blood sugar monitoring and prescribing during the different phases of illness for Hospice in-patients.

These guidelines are based on END OF LIFE DIABETES CARE, Clinical Care Recommendations 3<sup>rd</sup> edition March 2018, commissioned by Diabetes UK

Aim – To maintain glucose level (CBG – capillary blood glucose) >6mmols/l and <15mmols/l.

## 3. General prescribing guidelines

All diabetic patients should have their CBG checked TDS pre-meal (8pm, 12noon, 5pm) on admission for 48 hours. If CBGs are <15 the frequency of CBGs can be reduced to OD at 5pm. If there are any changes in medication (i.e. diabetic medications, steroids) or significant changes in condition (i.e. reduced oral intake) it may be appropriate to increase the frequency to TDS for a further 48 hours.

All known diabetic patients should have the below prn medications and instructions prescribed.

- Fiasp (rapid acting insulin) 2 units s/c if CBG 15-18, 4units if CBG 18-20 and 6 units if CBG >20.
- Glucogel 1 sachet oral to be given if BM <4

If the BM is >23 then the On-call consultant should be contacted and a dose of 8 units of Fiasp considered. Following a dose of Fiasp the CBG should be rechecked after 1 hour and a further appropriate dose of Fiasp given if the CBG remains above 15.

Regular insulin doses must be reconciled by the admitting doctor and nurse using two separate sources on admission.

**Please see the attached flowchart for the management of diabetes on page 8 of these guidelines.**

#### 4. Prognosis of a year plus

Review cardio-protective therapies (e.g. antihypertensive medication, aspirin, statins) in light of a life limiting diagnosis and whether dose reduction or withdrawal is appropriate. Side effects, weight loss and burden of treatment should be considered and discussed with the patient.

Type 1 Diabetes	<ul style="list-style-type: none"> <li>- Follow patient's normal CBG monitoring and insulin regimen</li> <li>- Adjust insulin by 10% if CBGs consistently high or low, consider liaising with diabetic specialist</li> <li>- If acutely unwell check CBG. If hypo/hyperglycaemic treat appropriately.</li> </ul>
Type 2 Diabetes	<ul style="list-style-type: none"> <li>- Follow patient's normal CBG monitoring and medication/insulin regimen.</li> <li>- Adjust medication/insulin if CBGs consistently high or low, consider liaising with diabetic specialist</li> <li>- If diet controlled and found to have persistently raised CBGs consider commencing metformin or short acting sulphonylurea i.e. Gliclazide</li> </ul>

Table 1. Treating Diabetes in patients with a prognosis of >1 year

#### 5. Prognosis months

Keep drug interventions to a minimum – in general once daily long-acting insulin alone is simpler than combinations of medications.

Type 1 Diabetes	Insulin	<ul style="list-style-type: none"> <li>- Follow patient's normal CBG monitoring and insulin regimen</li> <li>- Adjust insulin by 10-20% if CBGs consistently high or low, consider liaising with diabetic specialist</li> </ul>
Type 2 Diabetes	Insulin	- As above
	Tablet controlled	<ul style="list-style-type: none"> <li>- Monitor CBG twice weekly at 5pm</li> <li>- Continue if reasonable renal function and appetite</li> <li>- Stop if either renal function or appetite deteriorates</li> </ul>
	Diet controlled	<ul style="list-style-type: none"> <li>- Monitor CBG twice weekly at 5pm</li> <li>- If persistently raised, consider starting treatment considering benefits/burden balance</li> </ul>

Table 2. Treating Diabetes in patients with a prognosis of months

## 6. Managing diabetes in a dying patient (prognosis days)

It is important to discuss the changes in approach to the management of diabetes with the patient and/or their family. The aim of treatment is now to avoid hypoglycaemia or symptomatic hyperglycaemia whilst avoiding unnecessary invasive monitoring.

Type 1 Diabetes	Insulin	Continue morning long acting insulin with 25% dose reduction Check CBG at 5pm - If <8mmols/l reduce insulin by 10-20% - If >20mmols/l increase insulin by 10-20%	
Type 2 Diabetes	Diet controlled or on metformin	Stop monitoring CBGs	
	Other tablets and/or insulin/GLP1 Agonist	Stop tablets and GLP injections Consider stopping insulin	
		Insulin stopped - Daily urinalysis for glucose - If >2+ do CBG - If CBG> 20 give 6units Fiasp - Recheck CBG after 1 hour - If has >2 Fiasp doses in 24 hours consider long-acting insulin	Insulin continued - OM dose long-acting insulin at 25% less than previous dose - Then as per Type 1 Diabetes above

Table 3. Treating Diabetes in dying patients

## 7. Prescribing steroids and diabetes

Steroids (usually dexamethasone or prednisolone) are used frequently in palliative care for symptom control and can worsen glycaemic control or precipitate diabetes in a patient not previously known to be diabetic. Once daily doses taken in the morning can cause a rise in blood sugar in the late afternoon or early evening whereas the effect of twice daily doses are less easy to predict.

Type 1 Diabetes	Insulin	Monitor as per normal regime
Type 2 Diabetes	Tablet or diet controlled	Check CBG TDS pre-meal (8pm, 12noon, 5pm) for 48 hours reducing to once daily at 5pm for 1 week if CBG <15 – if within normal range then check random CBG twice a week
Non-diabetics		Check CBG before commencing treatment If normal random CBG twice a week – stop after 2 weeks if within normal range

Table 4. CBG monitoring in patients starting steroids

If CBGs are not within normal range, follow below algorithm (table 5).

If the dose of steroids is altered, then reconsider the frequency of CBG monitoring and the diabetic treatment required.

Known Diabetes Reassess glucose control and current therapy			
Diet controlled or Metformin alone or Metformin + Gliptin	Sulphonylurea treated (e.g. Gliclazide)	Insulin treated	
<ul style="list-style-type: none"> <li>Test before evening mealtime</li> <li>If develops repeated high readings (urine glucose &gt; 2+ or blood glucose &gt; 15 mmol/l) add Gliclazide 40 mg with breakfast</li> <li>Increase morning dose by 40 mg daily increments</li> <li>Aim blood glucose 6-15 mmol/l or &lt;1+ glycosuria before evening meal.</li> </ul>	<p><b>If no hypoglycemia symptoms, day or night and taking less than 320 mg/day</b></p> <ul style="list-style-type: none"> <li>Adjust balance of twice daily doses of Gliclazide by giving up to a max 240 mg in morning dose plus 80 mg pm</li> <li>Aim blood glucose 6-15 mmol/l or &lt;1+ glycosuria before evening meal.</li> </ul>	<p><b>Twice daily insulin:</b></p> <ul style="list-style-type: none"> <li>Morning dose will need to increase according to glucose reading before evening meal</li> <li>Aim blood glucose 6-15 mmol/l before evening meal unless patient has 'hypo' before meals despite mid-meal snacks</li> </ul>	<p><b>Basal bolus insulin:</b></p> <ul style="list-style-type: none"> <li>Breakfast and lunchtime rapid acting insulin may need to increase to avoid high readings before lunch or evening meal.</li> <li>Aim blood glucose 6-15 mmol/l before lunch and evening meal unless patient has 'hypo' before meals despite mid-meal snacks or has long gaps between meals.</li> </ul>
<p><b>If no hyperglycemia symptoms, day or night taking 240 mg and still above target</b></p> <ul style="list-style-type: none"> <li>Consider adding evening meal dose of Gliclazide or move to morning insulin.</li> </ul>	<p><b>If no hypoglycemic symptoms, day or night and taking full dose 320 mg/day</b></p> <ul style="list-style-type: none"> <li>Switch to morning Humulin or Insuman Basal 10 units</li> <li>Aim blood glucose 6-15 mmol/l before evening meal</li> </ul>	<p><b>If glucose above 15 mmol/l before evening meal</b></p> <ul style="list-style-type: none"> <li>Increase dose</li> <li>Review daily until stable</li> <li>increasing dose as necessary</li> </ul> <p><b>If glucose &gt; 15 mmol/l before evening meal</b></p> <ul style="list-style-type: none"> <li>Consider increasing dose depending on risk of hyperglycemia</li> <li>Review daily until stable increasing dose as necessary</li> </ul>	<p><b>If glucose above 15 mmol/l before evening meal</b></p> <ul style="list-style-type: none"> <li>Increase breakfast or lunchtime dose</li> <li>Review daily until stable increasing dose as necessary</li> </ul> <p><b>If glucose &gt; 15 mmol/l before evening meal</b></p> <ul style="list-style-type: none"> <li>Consider increasing breakfast or lunchtime dose depending on risk of hyperglycemia</li> <li>Review daily until stable increasing dose as necessary</li> </ul>
<p><b>If glucose above 15 mmol/l before evening meal</b></p> <ul style="list-style-type: none"> <li>Increase dose by 4 units</li> <li>Review daily until stable, increase dose as necessary</li> </ul> <p><b>If glucose &gt; 15 mmol/l before evening meal</b></p> <ul style="list-style-type: none"> <li>Consider increasing dose depending on risk of hypoglycaemia overnight</li> <li>Review daily until stable increasing dose as necessary</li> </ul>	<p><b>Assuming no hypoglycaemia, pre-meal time glucose is above 10 mmol/l an increase in dose is needed:</b></p> <ul style="list-style-type: none"> <li>Increase dose by 10-20 % if dose below 20 units</li> <li>Increase dose by 10-20 % if dose 20-50 units</li> <li>Increase dose by 10-20 % if dose 50-100 units</li> <li>Review daily until stable increasing dose as necessary</li> </ul>		

Table 5. Algorithm for Managing Glucose with Once Daily Steroid Therapy (Diabetes UK)

## 8. Diabetic emergencies.

### Hyperglycaemia

Symptoms of hyperglycaemia include polydipsia, polyuria, headaches, tiredness and lethargy. Hyperglycaemia can be life threatening if Diabetic Ketoacidosis (DKA) or Hyperosmolar Hyperglycaemic State (HHS, previously known as Hyperglycaemic Hyperosmolar Non-Ketotic Coma, HONK) develop.

DKA – 2-3 day (can be more rapid) history of decline with symptomatic hyperglycaemia, hyperventilation, ketotic breath, vomiting and possibly coma. Precipitants include infection, non-compliance to insulin or incorrect dose.

HHS – 5-7 day history of decline with decreasing conscious level, focal neurological signs, dehydration and marked hyperglycaemia in a type 2 diabetic.

Both DKA and HSS are medical emergencies requiring hospital admission for IV rehydration and IV insulin sliding scale. If either of these conditions are suspected in a hospice in-patient, then the appropriateness of transfer to hospital should be discussed with the patient and or family. If it is inappropriate to transfer the patient to hospital, then appropriate rehydration and adapted insulin regime should be considered.

Treatment of hyperglycaemia without symptoms of DKA or HHS

If CBG is:

- 15-17.9mmol give 2 units Fiasp
- 18-19.9mmol give 4 units Fiasp
- >20mmol give 6 units Fiasp
- If >23mmol inform Ward Doctor/On-call Consultant and discuss whether 8 units of Fiasp is appropriate

Repeat CBG after 1 hour and follow above if CBG remains raised.  
Repeat CBG after 1 further hour and if CBG remains raised please contact Ward Doctor/On-call Consultant

After an episode of hyperglycaemia diabetic medications must be reviewed.

## Hypoglycaemia CBG <4mmol

Symptoms of hypoglycaemia include sweating, tremor, palpitations, confusion, aggressive/inappropriate behaviour, confusion, seizures or coma. See Table 6 for treatment of Hypoglycaemia.

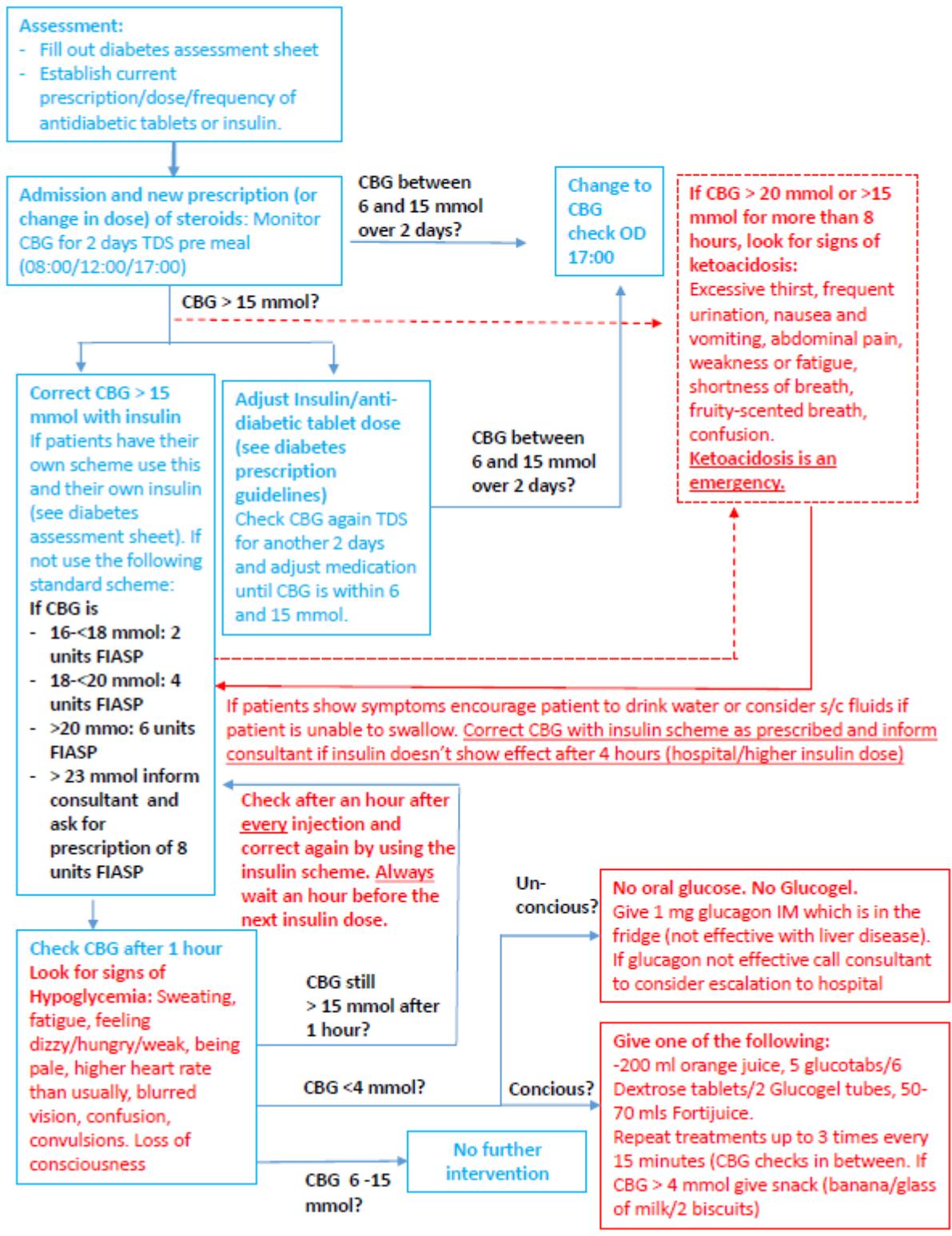
Conscious and able to swallow	2 tubes of oral Glucogel. If Glucogel not available use 200 ml orange juice/5 glucotabs/6 Dextrose tablets/50-70 mls Fortijuice. Repeat treatments up to 3 times every 15 minutes if CBG remains <4mmols Once CBG >4mmols give a starchy snack such a banana or 2 biscuits
Conscious and unable to swallow i.e. PEG feeds	2 tubes of Glucogel via PEG (may need diluting). If Glucogel not available use 200 ml orange juice/5 glucotabs/6 Dextrose tablets/50-70 mls Fortijuice. Repeat treatments up to 3 times every 15 minutes if CBG remains <4mmols Once CBG >4mmols restart feed
Unconscious secondary to hypoglycaemia	1mg glucagon IM If this is not effective contact consultant on call to discuss appropriateness of hospital transfer via emergency ambulance Once conscious give 1 sachet of Glucogel followed by a starchy snack such a banana or 2 biscuits

Table 6. Management of hypoglycaemia

After an episode of hypoglycaemia diabetic medication must be reviewed.

9. Flow Chart for Treatment of Patients with Diabetes.

**Guidelines for the treatment of patients with diabetes on the IPU**



## 10. Diabetes Assessment

Patient Name \_\_\_\_\_

DOB \_\_\_\_\_

Diabetes Type 1           Diabetes Type 2

Tablets  Name/dose/frequency \_\_\_\_\_

Long acting Insulin  Name/dose/frequency \_\_\_\_\_

Short acting Insulin  Name/dose pre-meals \_\_\_\_\_

### Insulin correction scheme

***If patient has no insulin scheme, please fill in standard scheme (see guidelines)***

Name of rapid/short acting insulin: \_\_\_\_\_

CBG 15 mmol: \_\_\_\_\_ units

CBG 16 mmol: \_\_\_\_\_ units

CBG 17 mmol: \_\_\_\_\_ units

CBG 18 mmol: \_\_\_\_\_ units

CBG 19-23 mmol: \_\_\_\_\_ units

CBG 23-25 mmol: \_\_\_\_\_ units

Steroids  Name/dose/frequency \_\_\_\_\_

Preferences in diet: \_\_\_\_\_

### Checklist

- Prescription for 3 days TDS CBG checks (08:00/12:00/17:00) after admission
- Prescription for tablets/Long acting insulin/Short acting insulin
- Prescription for short acting insulin scheme
- Diabetes Care Plan
- Explanation of Care Plan to the patient

Name/signature \_\_\_\_\_

