DIABETES UK
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End of Life Diabetes Care

Commissioned by Diabetes UK

Supplementary Documents and Flowcharts

Endorsed By:

DISN UK GROUP

NHS Diabetes

DIABETES Nurse Consultants

Phases of End of Life and Medications

A - Blue: "All" From Diagnosis Stable With Year Plus Prognosis

The use of cardio-protective therapies (e.g. ACE inhibitors, angiotensin-receptor blockers, aspirin, statins) should be reviewed in the light of the diagnosis and the presence of other medical co-morbidities, and dosage reductions (even withdrawal) of some of the therapies considered.

Patients may experience more gastrointestinal effects from aspirin with poor dietary intake or concurrent steroid use. Patients on aspirin and steroids should be considered for gastro-intestinal protection with a proton-pump inhibitor or suitable alternative. Oral hypoglycaemic agents (OHAs) should be reviewed and the targets for glucose control agreed. Weight loss may mean a reduced need for OHAs or offer potential for simplifying regimens including insulin.

B - Green: "Benefits" Ds1500 Unstable / Advanced Disease Months Prognosis

At this stage the aim is to keep drug interventions to a minimum that will control symptoms. All of the above comments apply but complex regimens should be reviewed especially where patients are on combinations of oral hypoglycaemic agents with insulin. It is generally simpler for patients to switch from combinations to insulin alone, once or twice daily insulin.

- Insulin alone is a simpler option than combinations of tablets and insulin

Insulin regimens should be simplified if possible. The likelihood of carers being involved in insulin therapy increases at this stage and may inform the choice of insulin regime.
If moving from twice daily to once daily insulin, the starting dose of long acting insulin such as Glargine or Insulin Degludec should be less than the total dose of twice daily isophane or pre-mixed insulin and 75% of total previous dose is recommended

- Once daily insulin is a simpler option if carers are involved and/or appetite is changing

C - Yellow: "Continuing Care" Deteriorating Weeks Prognosis

Patients may present at this stage, in which case all of the suggested changes above should be considered but keeping in mind that there may be little time to get used to a new insulin regimen. Intensive support can be needed for dose adjustments as well-being, activity and appetite can change day to day.

Managing diabetes can be an added stress at an emotional time for patients and carers. Relaxing targets for control may seem like 'giving up" for some while others may view managing diabetes in addition to their terminal illness as "pointless"

D - Red: in the final days of life / terminal care with one or more days prognosis

Ideally by this stage diabetes treatment has been minimised so that few changes are needed in the last days of life.
If the stage is reached where the patient is bed bound, semi-comatose, no longer able to take tablets, no longer able to eat and only able to take sips of fluid, use of local protocol, or an alternative guidance such as "Deciding Right" should be considered.

At this stage, the Flowchart for Diabetes at End of Life describes how to manage diabetes in the dying patient. It can be reassuring for relatives and carers to know that this additional plan of care is being followed and that the diabetes is being managed differently rather than being "ignored".

The flowchart has been devised to minimise symptoms of diabetes but keep invasive testing to the minimum needed to achieve that aim.

Medicines Management: Non- Insulin therapies

Metformin (standard Metformin or Glucophage SR®)	Sulphonylureas (gliclazide / glipizide / glimepiride)	Pioglitazone	Gliptins	GLP-1 analogues (exenatide or liraglutide, Lixisenatide and Bydureon)	Sodium Glucose Co-Transporter 2 Agents (SGLT2) Dapagliflozin (Forxiga)
Review dose according to changing renal function	Review if dietary intake is reduced and/or there is significant weight loss	The risk- benefit ratio for pioglitazone in patients with terminal disease requires review and should be only prescribed if benefits can clearly be identified	Review doses in accordance with individual licences if renal function deteriorates	Review if eating patterns change or significant weight loss occurs	Starting dose is 10mg daily, unless there is severe liver failure, then start at 5mg
Withdraw if creatinine >150mmols/l or eGFR < 30ml/l/1.73m^2	Review dose if renal function deteriorates and consider a switch to tolbutamide		Some gliptins can be used for all stages of renal disease	Withdraw if abdominal pain or pancreatitis develops	Withdraw if eGFR < 60ml/l/1.73m^2
Review if gastrointestinal disease is present or symptoms of nausea, heartburn, diarrhoea or flatulence are making patients miserable with discomfort	Review dose if liver function deteriorates as hypoglycaemia may occur	Should not be used in patients with or at risk of bladder tumour or heart failure	Combination with sulphonylurea increases the risk of hypoglycaemia		Limited evidence for use in people over 75 years old

Insulin therapies (Type 1 and Type 2 Diabetes)

Insulin (Type 1 and Type 2 Diabetes)	
• Doses may need to change with changes in renal function	• Equipment for insulin delivery may need to be reassessed if physical capabilities alter, vision is poor, or carers become involved in giving insulin
• Hypoglycaemia risk will need to be reassessed with changes in eating patterns	• Evening Isophane (Insulatard / Humulin I, or Insuman Basal) in combination with daytime oral hypoglycaemic drugs may be a good first line treatment choice
• A change of insulin regimen may be needed to match changes in activity levels	• The simplest regimen should be chosen if switching to insulin only, both once or twice daily injection can be considered

End of Life Diabetes Managment

Treating Hypoglycaemia

Treating Hypoglycaemia

Is patient conscious and able to swallow?

Yes

Give one of the following:

- 150 ml of non-diet cola (small can)
- 200 ml of pure smooth orange juice (small carton)
- 100 ml of Lucozade Original
- 4 glucotabs
- 5 to 6 dextrose tablets

If after 5 minutes, the blood glucose level is still less than 4 mmol/l, repeat the treatment.

Once the blood glucose is above 4 mmol/l, give a starchy snack like a banana or glass of milk or 2 biscuits unless a meal will be eaten in the next 1 to 2 hours

No

Is patient conscious and not able to swallow?

Yes

Patients on PEG feeds:

You should stop the feed and insert one of the following;

- 30ml undiluted Ribena
- 150 ml non-diet cola
- 100 ml Lucozade Original into the feeding tube.

Repeat this procedure every 5 minutes until the blood glucose is above 4 mmol/l.

Afterwards resume the feed.

No

If unconscious:

Put the patient in the recovery position and maintain airway - **do not** put glucose in the mouth. Give 1mg glucagon intra-muscularly if available and carer trained.

If glucagon is not available or is ineffective, and IV access is available, give 75-80ml of 20% glucose (over 10-15 minutes). If not available, call paramedics.

Note: glucagon may not be effective in people with liver disease

Once conscious (usually after about 10 minutes), give one of the following:

- 150ml non-diet cola
- 100ml Lucozade

Follow with a starchy snack such as a banana or 2 slices of bread.

After an episode of hypoglycaemia:

Consider discontinuing insulin (unless type1 diabetes) or reducing insulin or oral hypoglycaemic agents
Review management plan with patient and relatives to clarify/confirm goals of diabetes management or their stage of life.

End of Life Diabetes Care Management

End of Life Diabetes Management

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 (DSNs) are involved and agree monitoring strategy.

Type 1 diabetes always on insulin

Continue once daily morning dose of insulin Glargine (Lantus®) with reduction in dose

Check blood glucose once a day at teatime:

- If below 8 mmols/l reduce insulin by 10-20%
- If above 20 mmols/l increase insulin by 10-20% to reduce risk of symptoms or ketosis

Type 2 diabetes on other tablets and/or insulin / or GLP1 Agonist#

Stop tablets and GLP1 injections
Consider stopping insulin depending on dose

If insulin to continue:

- Prescribe once daily morning dose of isophane insulin^ or long acting insulin Glargine (Lantus®) based on 25% less than total previous daily insulin dose

If insulin stopped:

- Urinalysis for glucose daily - if over 2+ check capillary blood glucose
- If blood glucose over 20 mmols/l give 6 units rapid acting insulin *
- Recheck capillary blood glucose after 2 hours

If patient requires rapid acting insulin* more than twice consider daily isophane insulin^ or Glargine (Lantus®)

Type 2 diabetes Diet controlled or Metformin treated

Stop monitoring blood sugars

- 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 "hypo" 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 patient where insulin has been discontinued.

Key

Byetta (Exenatide) /Victoza, (Liraglutide), Lyxumia (Lixisenatide)

* Humalog/Novorapid®/Apidra

^ Humulin I /Insulatard/ Insuman Basal

For queries relating to the diabetes flowchart please contact the Diabetes Specialist Nurses
For queries relating to palliative care please contact the Palliative Care Team

End of Life Diabetes Management - Managing Glucose Control on Once Daily Steroids

No known diabetes
- Check random glucose before starting on steroids to identify patients at risk
- Random capillary blood glucose over **8** mmol/l needs further checking with venous blood
- Random venous glucose over **7.8** mmol/l means at risk of developing diabetes with steroid therapy
- Random venous glucose over **11** mmol/l needs a second check to confirm pre-existing unknown diabetes

Known Diabetes
- Reassess glucose control and current therapy

Diet controlled or Metformin alone or Metformin + Gliptin

- Test before evening mealtime
- If develops repeated high readings (urine glucose>2+ or blood glucose >15mmol/l) add Gliclazide 40mg with breakfast
- Increase morning dose by 40mg increments
- Aim blood glucose 6-15mmols/l or <1+ ≤trace glycosuria before evening meal

If no hypoglycaemia symptoms, day or night, taking 240mg and still above target
- Consider adding evening meal dose of Gliclazide or move to morning insulin

Sulphonylurea treated (Gliclazide)

If no hypoglycaemia symptoms, day or night and taking less than 320mg/day
- Adjust balance of twice daily doses of Gliclazide by giving up to a max 240mg in morning dose plus 80mg pm)
- Aim blood glucose 6-15 mmol/l or <1+ glycosuria before evening meal

If no hypoglycaemia symptoms, day or night and taking full dose 320mg/day
- Switch to morning Insulatard, Humulin I or Insuman Basal 10 units on first day of steroids
- Aim blood glucose 6-15 mmol/l before evening meal

If glucose above 15 mmol/l before evening meal
- Increase dose by 4 units
- Review daily until stable increasing dose as necessary

If glucose 10 - 15 mmol/l before evening meal
- Consider increasing dose depending on risk of hypoglycaemia overnight
- Review daily until stable increasing dose as necessary

Insulin controlled

Twice daily insulin
- Morning dose will need to increase according to glucose reading before evening meal
- Aim blood glucose 6-15 mmol/l before evening meal unless patient has "hypo" before meals despite mid-meal snacks

If glucose above 15 mmol/l before evening meal
- Increase dose
- Review daily until stable increasing dose as necessary

If glucose 10 - 15 mmol/l before evening meal
- Consider increasing dose depending on risk of hypoglycaemia
- Review daily until stable increasing dose as necessary

Basal bolus insulin
- Breakfast & lunchtime rapid acting insulin may need to increase to avoid high readings before lunch or evening meal
- 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

If glucose above 15 mmol/l before lunch or evening meal
- Increase breakfast or lunchtime dose
- Review daily until stable increasing dose as necessary

If glucose above 15 mmol/l before lunch or evening meal
- Consider increasing breakfast or lunchtime dose depending on risk of hypoglycaemia
- Review daily until stable increasing dose as necessary

Assuming no hypoglycaemia, pre meal time glucose is above 10mmol/l and increase in dose is needed
- Increase dose by 2-5 units if dose below 20 units
- Increase dose by 5-10 units if dose 20-50 units
- Increase dose by 10-20 units if dose 50-100 units
- Review daily until stable increasing dose as necessary

If steroids are reduced or discontinued: review any changes made and consider reverting to previous therapy or doses
If unsure at any stage about next steps or want specific advice on how to meet with patients needs or expectations please contact the Diabetes Specialist Team

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End of Life Diabetes Care: Clinical Care Recommendations 2nd Edition October 2013

A Guide for Healthcare Professionals

Sick Day Management for End of Life Diabetes Care (HCP)

A number of common precautions are often necessary to reduce the development of acute metabolic complications in people with diabetes during end of their life - Specific advice on treatment food intake and diabetes medication is provided in this leaflet, for Healthcare Professionals use only

Type 2 Diabetes: Specific Advice

1. Patients with Type 2 Diabetes on diet alone or tablets that are not sulphonylureas or prandial regulators	2. Patients with Type 2 diabetes on a sulphylurea, prandial regulator and/or insulin
• Encourage the individual to take small sips of fluid regularly. (aim for 100ml per hour) • Offer frequent small portions of easily digested foods or fluids e.g. soup, ice cream, milky drinks • Observe for signs and symptoms of hyperglycaemia and dehydration • Only check capillary blood glucose to confirm hyperglycaemia: aim to maintain blood glucose at 15mmol/l or less • Consider stopping metformin if the patient has sickness/diarrhoea	• Check blood glucose only to confirm symptoms of hyperglycaemia or hypoglycaemia • Offer frequent small easily digested carbohydrate foods to replace meals if unable to eat normally. Offer sips of sugar-free fluids, aiming for 100mls over an hour • Consider increasing diabetes medications (if blood glucose levels above 15mmol/l)or reducing diabetes medication (if blood glucose levels less than 6mmol/l) • Diabetes treatment may be discontinued if the patient is NOT eating and blood glucose level is less than 15mmol/l and patient is symptom-free

Type 1 Diabetes: Specific Advice

Patients with Type1 Diabetes on insulin treatment appropriate measures include:

Do not discontinue the long-acting insulin

- Encourage the patient to sip sugar-free fluids regularly (aim for 100ml per hour)
- If unable to eat usual meals, offer frequent small portions of easily digested foods or fluids e.g. soup, ice cream, milky drinks
- Test for urine or blood ketones if patient has symptoms of hyperglycaemia and dehydration
- If ketones are present, test blood glucose and ketones 2 hourly:- continue usual insulin regimen (e.g. long-acting insulin daily) but add an additional 10% of current total average daily insulin dose as short-acting insulin (e.g. Humulin S, Apidra, NovoRapid) every 2 hours if ++ or greater on urine ketone strip or greater than 1.5mmol on blood ketone test. *
- If ketone levels do not improve, and the patient is vomiting, admit to hospital for intravenous insulin and rehydration

** If this advice is not practical for those working in a community setting please contact the hospital team for advice*

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:

Conditions of withdrawal

1. When the patient is commenced on the Liverpool Care Pathway
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

Treating hypoglycaemia

If patient conscious and able to swallow give one of the following:	If patient conscious and unable to swallow, patients on PEG feeds: stop feed and insert one of the following:
150ml of non diet cola	30ml undiluted Ribena
200ml of pure smooth orange juice	150ml non-diet cola
100ml lucozade original	100ml lucozade original into the feeding tube
Once blood glucose is >4mmol/l give a starchy snack.	Repeat procedure every 5 mins until blood glucose >4mmol/l and resume feed.

Always seek advice from the Diabetes Specialist Team

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