

Lower carb dietary option, Doctor/Nurse protocol Norwood GP Surgery: T2D, prediabetes,

General point: Remember not all low carb diets are necessarily good, for example a diet coke and pepperoni sausage diet is low carb, but not well formulated. A well formulated low carb diet will be full of fibre & essential nutrients[1] see The Norwood diet sheet

At the first appointment:

- Explore possible benefits/ risks of a lower carb approach to T2diabetes (eg medications risk of hypo) and make a start on motivation. The idea of diabetes remission or coming off meds is very motivating for many people.

An example of the type of question you can ask.

'You have a range of different possible futures WRT to your diabetes, which will you choose?'

'Average weight loss on low carb is 9Kg is this of interest to you?' etc.,

- Check are the patients interested in the low carb approach?

-Visit basic physiology of sugar starting with the fact that 'your HbA1c shows how sugary your diet has been in the last few months', and explaining sugar can almost be seen as a metabolic poison to someone with T2D.

Ask

'Where do you think the sugar has come from in your diet?'

Explain dietary sources of glucose with sugar equivalence infographics[2] (shortlisted for a prize by NICE)

Give the Norwood standard diet sheet for low carb approach.

Establish baseline data; Wt., waist, height, bloods; HbA1c, renal, fasting lipids, FBC.

Enter EMIS computer code 'low carbohydrate diet'.

-Medications

Three risks to be aware of[3]:

1. **Risk of hypoglycaemia** (Insulin, gliclazide) reduce dose/stop but monitor
2. **Risk of DKA** particularly with SGL2Inhibitors[4] in which case the DKA may be euglycaemic (normal blood glucose). Stop before starting the diet, monitor blood glucose and weight carefully.
3. **Risk of hypotension**, explain that with weight loss BP may well improve and medications for this may be reduced or cut back[5]

-Salt; Due to the renal sodium retaining properties of insulin[5] for those with T2D going low carb and therefore lower insulin results in considerable loss of sodium and consequently a diuresis. Patients may well need to increase their salt intake –particularly in the first few weeks of the diet. Those on diuretics may be able to stop them

-Suggest a review date - often 2 or 4 weeks depending on assessed risks. Perhaps longer for pre-diabetes

On review

Weigh, measure waist, BP. Do medications need to be changed? See above
How is it going? Problems/suggestions

Three worrying patterns wrt HbA1c

1. **If both weight and HbA1c are climbing** the most common reason is 'carb creep' **NOT** failure of the diet needing medication. So check for this by rechecking dietary intakes. Over time many patients drift. It's better to see this as a learning opportunity. We all learn from our mistakes!
2. **Weight loss alongside a climbing HbA1c** is worrying –ask a doctor about this. ? T1D, ?Malignancy
3. **HbA1c 'too good'** eg. 28mmol/mol could the patient be anaemic?

Produce Emis graphs of Wt., HbA1c etc. as feedback to maintain motivation.

Do they wish to continue?

Are they happy to share anonymised data?

If so enter Emis GP computer code 'obtaining consent'

Would they like to attend the group sessions –do they know how to find out when the next one is?

Next steps

Review date and agree next blood test (HbA1c etc.) -usually at 2 months from the start, but this depends on a risk analysis.

Lipid profiles Fasting profiles are preferable as triglyceride/HDL ratios are a better predictor of risk than LDL Lipid profiles usually (but not always) improve on low carb[6]

Finally NICE UK guidelines 1.3.6 Individualise recommendations for carbohydrate and alcohol intake, and meal patterns. **Reducing the risk of hypoglycaemia should be a particular aim for a person using insulin or an insulin secretagogue. [2009]**

Often this is achieved by increasing dietary carbs at the expense of weight gain **An alternative** is to reduce carbs and the drugs involved this has the advantage of weight loss and improvements in BP

References

1. Zinn, C., A. Rush, and R. Johnson, *Assessing the nutrient intake of a low-carbohydrate, high-fat (LCHF) diet: a hypothetical case study design*. *BMJ Open*, 2018. **8**(2): p. e018846.
2. David Unwin, D.H., Geoffrey Livesey,, *It is the glycaemic response to, not the carbohydrate content of food that matters in diabetes and obesity: The glycaemic index revisited*. *Journal of InsulinResistance*,**2016;1(1),a8**.(<https://insulinresistance.org/index.php/jir/article/view/8/11>).
3. Murdoch, C., et al., *Adapting diabetes medication for low carbohydrate management of type 2 diabetes: a practical guide*. *Br J Gen Pract*, 2019. **69**(684): p. 360-361.
4. Murray, S.W., et al., *The "discordant doppelganger dilemma": SGLT2i mimics therapeutic carbohydrate restriction - food choice first over pharma?* *Journal of Human Hypertension*, 2021.
5. Unwin, D.J., et al., *Substantial and Sustained Improvements in Blood Pressure, Weight and Lipid Profiles from a Carbohydrate Restricted Diet: An Observational Study of Insulin*

Resistant Patients in Primary Care. International Journal of Environmental Research and Public Health, 2019. **16**(15): p. 2680.

6. Gjuladin-Hellon, T., et al., *Effects of carbohydrate-restricted diets on low-density lipoprotein cholesterol levels in overweight and obese adults: a systematic review and meta-analysis*. Nutr Rev, 2018.