



LOW CARB PROGRAM

# Low Carb Implementation Pack

CATEGORISATION	TYPICAL CLINICAL PATIENT CHARACTERISTICS OF 'RED' PATIENTS	CONSIDERATIONS	CLINICAL IMPLICATIONS
<b>RED</b>  <b>HbA1c &gt;75mmol/mol</b>  And / or  <b>Diabetes medications:</b>  INSULIN or other injectables  SGLT2 inhibitors ('flozins')  Blood pressure medications prescribed  <b>Best clinical outcomes here!</b>	<ul style="list-style-type: none"> <li>BMI &gt;35</li> <li>eGFR &lt;45 Uncontrolled hypertension or hypertension requiring several antihypertensives.</li> <li>Evidence of macro and microvascular complications of diabetes;</li> <li>Macrovascular – Previous coronary heart disease or cerebrovascular disease.</li> <li>Microvascular – Proteinuria (includes ACR &gt;3) , diabetic retinopathy, peripheral neuropathy</li> </ul> <p><b>Associated conditions;</b></p> <ul style="list-style-type: none"> <li>Metabolic syndrome</li> <li>NAFLD/PCOS/isolated high serum triglyceride level – these potentially respond well to a low carb approach but may need more monitoring</li> </ul>	<p>Patient Activation Measure</p> <p>QOF targets</p> <p>Comorbidities</p> <ul style="list-style-type: none"> <li>Bear in mind possibility of postural hypotension for those on multiple medications for blood pressure</li> </ul> <p>Consider use of freestyle libre for those on insulin</p> <p>For those patients with ankle oedema on water tablets bear in mind this may improve significantly enabling deprescribing of diuretics</p> <p>Higher chance of ulceration +/- input from vascular team</p> <p>Eye status should be considered in patients at increased ocular risk prior to initiating intensive treatments</p>	<p>Review for this patient group depends on clinical assessment of need.</p> <p><b>Baseline:</b> HbA1c and weight, waist circumference, BP, query fasting lipids (depend on practice), renal function, (possible blood glucose self-monitoring), meds review to stop in accordance with Campbell's BJGP REF</p> <p><b>2 weeks:</b> blood pressure and BP medication review, weight, meds review to stop in accordance with Campbell's BJGP REF, water tablets review, problem solving</p> <p><b>Next review depends on progress/clinical need:</b></p> <p><b>3 months:</b> blood pressure and BP medication review, weight, meds review to stop in accordance with Campbell's BJGP REF, water tablets review, problem solving</p> <p><b>6 months:</b> if 3 months going well, may not need this review</p> <p><b>9 months:</b></p> <p><b>12 months:</b></p> <p><b>6 month reviews for years 2 and 3</b></p>

CATEGORISATION	TYPICAL CLINICAL PATIENT CHARACTERISTICS OF 'AMBER' PATIENTS	CONSIDERATIONS	CLINICAL IMPLICATIONS
<p><b>AMBER</b></p> <p><b>HbA1c 58–75 mmol/mol</b></p> <p>And / or</p> <p><b>Diabetes medication:</b></p> <p>Sulphonylureas (for example, gliclazide) and meglitinides (for example, repaglinide)</p> <p>Blood pressure medication prescribed</p>	<ul style="list-style-type: none"> <li>• BMI &gt;35</li> <li>• Mildly raised BP</li> <li>• eGFR 45–60</li> <li>• Evidence of macro and microvascular complications of diabetes;</li> <li>• Macrovascular – Previous coronary heart disease or cerebrovascular disease</li> <li>• Microvascular – Proteinuria (includes ACR &gt;3) , diabetic retinopathy, peripheral neuropathy</li> </ul> <p><b>Associated conditions;</b></p> <ul style="list-style-type: none"> <li>• Metabolic syndrome</li> <li>• NAFLD/PCOS/isolated high serum triglyceride level – these potentially respond well to a low carb approach but may need more monitoring</li> </ul>	<p>Patient Activation Measure</p> <p>QOF targets</p> <ul style="list-style-type: none"> <li>• Bare in mind possibility of postural hypotension for those on multiple medications for blood pressure</li> </ul> <p>For very heavy patients consider more clinical review and support also consider involving wider family (possible benefit as family intervention)</p> <p>Gliclazide – consider halving or even stopping at baseline because of the risk of hypoglycaemia.</p>	<p>Varies depending on clinical need/risk (based on clinical best practice)</p> <p><b>Baseline:</b> HbA1c and weight, waist circumference, BP, for those with metabolic syndrome consider additional monitoring of fasting lipids (including triglyceride) and liver function tests or ultrasound scan of the liver, monitor renal function if Proteinuria detected</p> <p><b>3 months:</b> REVIEW HbA1c and weight, waist circumference, BP, for those with metabolic syndrome consider additional monitoring of fasting lipids (including triglyceride) and liver function tests, MEDICATION review BP in particular</p> <p><b>6 months:</b> clinical discretion to skip</p> <p><b>9 months:</b></p> <p><b>12 months:</b> QOF</p> <p><b>Annual reviews years 2 and 3:</b></p>

CATEGORISATION	TYPICAL CLINICAL PATIENT CHARACTERISTICS OF 'GREEN' PATIENTS	CONSIDERATIONS	CLINICAL IMPLICATIONS
<p><b>GREEN</b></p> <p><b>HbA1c &lt;58mmol/mol</b>, (this could include prediabetes HbA1c between 42-48mmol/mol)</p> <p>And / or</p> <p><b>Diabetes medication:</b></p> <p>Lifestyle and/or metformin only</p> <p>No medication prescribed for blood pressure</p> <p>Clinically easiest to start with this group</p>	<ul style="list-style-type: none"> <li>BMI &lt;35kg/m<sup>2</sup> –no special risk/consideration</li> <li>Normal BP</li> <li>No other features in high or medium risk groups</li> <li>Patients tend to be asymptomatic</li> </ul>	<p>Reducing risk of type 2 diabetes patients becoming costly (repeat medications and complications/morbidity)</p> <p>Easier to start with this group</p> <p>No hypo risk</p> <p>QOF targets</p>	<p><b>Baseline:</b> HbA1c and weight, waist circumference, BP, fasting lipids, liver function tests</p> <p><b>3 months:</b> important for clinical feedback to patients for motivation – HbA1c and weight, waist circumference, BP, fasting lipids, liver function tests</p> <p><b>6 months:</b> not necessary</p> <p><b>9 months:</b> optional</p> <p><b>12 months:</b> HbA1c and weight, waist circumference, BP, fasting lipids</p> <p><b>Annual reviews years 2 and 3:</b> If doing well/happy with progress – HbA1c and weight, waist circumference, BP, lipids</p> <p><b>Review need for medication (Metformin) at each stage</b></p>

## EXCLUSION CRITERIA

### Common;

- Pregnancy & breastfeeding
- History of eating disorders

### Uncommon;

- Porphyria
- Carnitine deficiency (primary)
- Carnitine palmitoyltransferase (CPT) I or II deficiency
- Carnitine translocase deficiency
- Beta-oxidation defects
- Medium-chain acyl dehydrogenase deficiency (MCAD)
- Long-chain acyl dehydrogenase deficiency (LCAD)
- Short-chain acyl dehydrogenase deficiency (SCAD)
- Long-chain 3-hydroxyacyl-CoA deficiency
- Medium-chain 3-hydroxyacyl-CoA deficiency
- Pyruvate carboxylase deficiency

- Additional considerations and clinical support may be required for the following groups and should be considered on an individual basis:
  - Social complexity LD
  - SMI housebound
  - Homeless
  - Alcohol or substance misuse
  - Severe mental illness or dementia
  - Cognitive impairment

Hypercholesterolemia is not a contra-indication to a low carb diet. Regular cholesterol monitoring tends to result in an improved cholesterol profile. Shared decision making with clinician and patient should be undertaken to undertake Individual clinical risk assessment including the use of statin therapy.

Kossoff et al., Optimal clinical management of children receiving dietary therapies for epilepsy: Updated recommendations of the International Ketogenic Diet Study Group., *Epilepsia Open*. 2018 May 21;3(2):175–192

# Implementation checklist

Now that you have attended your first online training session for the Low Carb Program, here is an implementation support checklist, which helps to understand the steps required for prescribing the Low Carb Program to your patients.

## Your local point of contact

Your local point of contact will ensure you have the necessary information and resources to support your patients as they begin the Low Carb Program.

## Go live date

This is the date you will be able to begin issuing licenses to your patients. Before this date, you should complete the below checklist.

### Protocol for issuing licenses

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Page 2 of this document outlines the protocol for issuing licenses and the clinical implications for your patients. This document will be covered during your training session.

### Further training date(s)

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Your local point of contact will inform you of future training dates for the Low Carb Program, which you can attend via Zoom. The duration of the training sessions are two hours and will be provided by the team at the Low Carb Program.

### Patient engagement

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Click [here](#) to access the patient engagement video. This video can be shared with your patients to assess their interest in using the Low Carb Program to better their health.

### Patient onboarding date(s)

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Your patients will have access to weekly virtual onboarding sessions delivered by the team at the Low Carb Program. During these sessions, patients will be shown how to sign up, how to use the Program and have the opportunity to ask any questions.

### Access to Healthcare

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#### Professional Training e-learning

You will receive access to a video library of resources to help you in understanding the theory and principles of a low carbohydrate diet, to better support your patients.

Click [here](#) to watch the Low Carb Program's Healthcare Professional training session.

### Low Carb Program licenses

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You will receive digital or physical licenses containing a voucher code. These licenses should be distributed to your patients in order to sign up to the Low Carb Program. When doing so ensure your patients are aware of the dates for the patient onboarding sessions so they can attend – during this session we can support the sign up process.

### Baseline data

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When giving your patient access to a licence for the Program please ensure to give them their baseline weight and HbA1c so that they can input this into the app.

If the appointment is by phone please encourage your patient to note down their data.

Your local point of contact will provide you with a document you can share with your patients, including the dates, times and meeting details.

### HCP check-in sessions

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You can attend monthly HCP check-in sessions with a member of the Low Carb Program's clinical team. These sessions will be held over Zoom on every second Wednesday of every month at 12.30pm.

Join by clicking [here](#).

**Meeting ID:** 894 3126 2664

**Passcode:** 811696



# TYPE 2 DIABETES: DIABETES MEDICATIONS ON A LOW CARBOHYDRATE DIET

## SUMMARY AND SUGGESTIONS



There are three considerations with the use of diabetic medications in type 2 diabetes and a low carbohydrate diet:

- Is there a risk of hypoglycaemia?
- What is the degree of carbohydrate restriction?
- Does the medication provide any benefit, or do any potential benefits outweigh any side effects and potential risks?

Drug group	Hypo risk?	Clinical suggestion
<b>Sulphonylureas (for example, gliclazide) and meglitinides (for example, repaglinide)</b>	Yes	Reduce/stop (if gradual carbohydrate reduction then wean by halving dose successively)
<b>Insulins</b>	Yes	Reduce/stop. Typically wean by 30–50% successively. Beware insulin insufficiency
<b>SGLT2 inhibitors (flozins)</b>	No	Ketoacidosis risk if insulin insufficiency. Usually stop in community setting
<b>Biguanides (metformin)</b>	No	Optional, consider clinical pros/cons
<b>GLP-1 agonists (-enatide/-glutide)</b>	No	Optional, consider clinical pros/cons
<b>Thiazolidinediones (glitazones)</b>	No	Usually stop, concerns over long-term risks usually outweigh benefit
<b>DPP-4 inhibitors (glipitins)</b>	No	Usually stop, due to lack of benefit
<b>Alpha-glucosidase inhibitors (acarbose)</b>	No	Usually stop, due to no benefit if low starch/sucrose ingestion
<b>Self-monitoring blood glucose</b>	N/A	Ensure adequate testing supplies for patients on drugs that risk hypoglycaemia. Testing can also support behaviour change (for example, paired pre- and post-meal testing)

Caution should be taken when reducing insulin if there is clinical suspicion of endogenous insulin insufficiency (Patients with LADA misdiagnosed as T2D; a minority of T2 patients have endogenous insulin deficiency). Consider these possibilities if patient was not overweight at diagnosis. Exogenous insulin should not be completely stopped in these cases. Inappropriate over-reduction of exogenous insulin will lead to marked hyperglycaemia. Hypo = hypoglycaemia. LADA = latent autoimmune diabetes in adults. T2D = type 2 diabetes.