Providing dietary advice for people with type 2 diabetes

Gaynor Bussell

This article deals with the dietary advice that should be provided to people with type 2 diabetes by anyone working in the community (it does not cover advice on physical activity or prevention of type 2 diabetes). If a patient with type 2 diabetes is overweight or obese, the most important factor is to lose weight — even a 5–10% weight loss can improve insulin sensitivity and hence diabetic control. Other factors that are considered in this article are the type of carbohydrate that can be eaten, with wholegrain/high-fibre, lower glycaemic index starches being the best option (the glycaemic index measures the effect of carbohydrates on blood glucose level). Although sugar provides ‘empty calories’ (food that supplies energy but negligible nutrition) and can result in weight gain, it does not contribute to diabetes directly. Cholesterol levels should be reduced by eating the correct fats, and salt levels should be kept to below 6g a day.

KEYWORDS:
Type 2 diabetes  □  Diet  □  Weight  □  Blood glucose level

Type 2 diabetes usually develops as a result of poor diet, lack of physical activity and, in over 80% of cases, excessive weight gain (Weight Control Information Network, 2012). It makes sense, therefore, that treatment for type 2 diabetes, especially in the initial stages, includes monitoring patients’ diet and lifestyle (Ajala et al., 2013). This article investigates the dietary recommendations for people with type 2 diabetes. However, the advice might also help prevent progression to full diabetes in people with insulin resistance (where the body produces insulin but does not use it effectively — a precursor to type 2 diabetes) (Diabetes Prevention Program Research Group, 2002).

In most cases, before clinically diagnosed type 2 diabetes eventually develops, the patient’s blood sugars will slowly have been rising as a result of increasing insulin resistance (sometimes known as impaired fasting glucose [IFG], where the fasting blood glucose level is elevated above what is considered normal but is not high enough to be diagnosed as diabetes mellitus). At this stage adopting a healthy diet, aiming for a degree of weight loss if body mass index (BMI) is greater than 25kg/m², and physical activity can be a useful treatment plan, which can prevent the need for oral medications and/or insulin initially (NHS Choices, 2014a).

If the patient is on oral medication/insulin, combining this treatment with a healthy diet and exercise, if possible, will help to minimise the dose of drugs required and stabilise blood sugar levels. A healthy diet can also minimise the increased risk people with diabetes have for blood pressure and heart disease (World Heart Federation, 2014).

**BLOOD SUGAR**

The main aim of treatment for people with type 2 diabetes is to keep blood sugar levels at between 4 and 7mmol/L before meals and no higher than 8.5mmol/L two hours after a meal — diet and exercise can help normalise blood sugars (Diabetes UK, 2014).

People with diabetes should receive education on appropriate testing of blood sugars, and suitable times and frequency for blood sugar monitoring to ensure that their blood sugars remain within the recommended levels (if in doubt, specialist diabetes nurses will be able to help with individual patient requirements).
Diabetic foot ulcers greatly affect quality of life and life expectancy. On any day of the week the number of people in the UK with an active foot ulcer would fill the O2 arena four times over...

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WEIGHT LOSS

Losing weight is the most beneficial action a patient can take to increase insulin sensitivity and improve glycaemic control, as well as offsetting the progression of diabetes and possibly reversing it (Kelly and Dyson, 2011). If a patient can lose 5–10% of their body weight, benefits include (Kelly and Dyson, 2011):

- Lowering blood sugar levels
- Reducing blood pressure
- Improving cholesterol levels
- Reducing the stress on hips, knees, ankles and feet.

Community nursing teams should consider first-line dietary advice, which would include reducing total calorie intake by 500–600 kcal per day (cutting calories by 500 kcals per day), which represents a steady weight loss, although some patients will inevitably lose weight at a slower or faster rate (Mayo clinic, 2014). A higher rate of weight loss can be detrimental and is not recommended unless under close medical supervision.

Portion size is a consideration when embarking on weight loss as larger portion sizes yield a higher amount of calories, particularly in fatty and sugary foods. Foods which are less energy dense, such as vegetables, can be eaten in larger portions as they are filling without being high in calories. One way that community nurses can help patients to follow this advice is to recommend that main meals reflect the ‘balanced plate’ approach (Figure 1).

This means that 50% of the main meal plate should be vegetable or salad. The rationale for this is to increase satiety (feeling of fullness) with the added advantage of decreasing total calorie intake. A further 25% of the main plate should comprise carbohydrate and patients should be advised to aim for wholegrain and low glycaemic index carbohydrates. It is important to have carbohydrates to provide fibre, a feeling of fullness and important nutrients (Diabetes UK, 2012a). The final 25% of the plate should comprise protein (such as meat, fish, eggs, nuts, soya and pulses). Protein provides essential nutrients but also has the added benefit of increasing satiety, which creates a feeling of fullness for longer.

CARBOHYDRATES

The type and quantity of carbohydrates in the diet is an important consideration for people with diabetes. Evidence suggests that carbohydrates should constitute approximately 50% of a person’s calorie intake (Norman, 2014), but that no more than 10% of a person’s energy intake (the total calories obtained from food) should be sugars (also a carbohydrate), which equates to a person consuming a total of no more than 90g of sugars per day. This is the current UK guideline for healthy eating in the whole population and also applies to people with diabetes (Department of Health [DH], 1991).

A recent draft report published by the Scientific Advisory Committee on Nutrition (SACN) recommended that free sugars (those not forming part of the structure of food and associated with foods such as sugary drinks and fruit juice) should form no more than 5% of a person’s total energy intake (SACN, 2014).

The glycaemic index (GI) is also a consideration. This is a measure of how fast carbohydrates are broken down and released into the blood stream as glucose (Diabetes UK, 2012b). Glucose itself is given a GI of 100, with all other starchy and sugary foods given a value relative to this, i.e. pasta is released 40% slower than pure glucose and consequently has a GI of 40. Slower release carbohydrates (with lower GIs) are believed to be better for people with diabetes as they avoid high sugar ‘spikes’ and lead to improved blood sugar control — they are also believed to help with satiety so that people do not get hungry as quickly between meals (Diabetes UK, 2012b).

It has been suggested that people with type 2 diabetes should try and eat more low GI carbohydrates, as this can ‘even out’ blood sugar levels and reduce insulin resistance (Diabetes UK, 2012b; Dyson et al, 2011) (Table 1).

There is some evidence that a diet containing a lower glycaemic load — where the quantity of carbohydrate is considered as well as its GI value — can help to offset the development of diabetes (Willet et al, 2002). However, there is little written about the effectiveness of a lower glycaemic load in controlling diabetes once the condition is present.

Where possible, carbohydrates should be wholegrain — this is not just because wholegrains are likely to have a lower GI, but also because wholegrain cereals are higher in fibre and are associated with protection from cardiovascular disease (Giacco et al, 2014).

Diabetes UK reviewed the evidence on carbohydrate intake for people with type 2 diabetes and concluded that there was evidence to suggest that low-carbohydrate diets can lead to improvements in HbA1c and reductions in body weight in the short term (less than one year) (Diabetes UK, 2012a). However, the evidence also suggested that the weight loss from a low-carbohydrate diet may be due to a reduced calorie intake and not specifically as a result of the carbohydrate reduction. Overall, Diabetes UK concluded that despite the potential short-term benefits of a low-carbohydrate diet, there is a lack of evidence of the long-term safety and benefit of following this diet. Also, when considering a low-carbohydrate diet as an option for weight loss, people with diabetes

![Figure 1](image-url)
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should be made aware of possible side-effects, such as the risk of hypoglycaemia, headaches, lack of concentration and constipation (Diabetes UK, 2012a).

**Sugar**
As mentioned above, sugar is a form of carbohydrate and does not need to be avoided altogether—indeed this would be impossible as it is used in many foods, including some healthy ones such as baked beans and granary bread. However, too much sugar can increase the blood sugar, therefore, very sugary foods and sugary drinks in particular should be avoided.

It is recommended that the total sugar intake is kept below 90g a day (DH, 1991), both for the general population and in people with diabetes. However, the definition of ‘sugar’ on food labelling includes that found naturally in fruit, honey and milk, for example. Sugar that is simply added to foods and tea and coffee, for example, provides energy but very little nutritional value and excess sugar can contribute to weight gain (Te Morenga et al, 2012). Using non sugar-based sweeteners can help to reduce overall calorie intake (Diabetes.co.uk, 2014).

### FATS
People with diabetes are more prone to cardiovascular disease, therefore, it is important that they consider the amount and type of fat consumed. Total fat intake should not exceed 20% of total calories or 70g a day. Because saturated fat can increase cholesterol levels if eaten in excess, this should be kept to 10% of total energy intake or less than 20g a day (DH, 1991).

Trans fats (unsaturated fats that are often artificially created) can raise cholesterol levels, while also lowering high-density lipoprotein (HDL) (so called ‘good’ cholesterol) levels. The recommended upper level for trans fat intake is 2% of total calories per day, and recent dietary surveys have suggested that the general population is now well below this at 0.7% on average (Roe et al, 2012). This is due to the fact that the food industry has been actively reducing the trans-fat levels in margarines and spreads.

The remaining energy from fats should come from mono-unsaturated and polyunsaturated fats plus some long chain omega-3 fatty acids, which can only be obtained from fish oil. Mono-unsaturated fats can help to reduce low-density lipoprotein (LDL), or so called ‘bad’ cholesterol, which encourages atheroma (accumulation of degenerative material in the artery walls).

Examples of mono-unsaturated fats include avocado; canola oil; nuts such as almonds, cashews, pecans and peanuts; olive oil and olives; peanut butter and peanut oil; and sesame seeds (Diabetes Education, 2014).

Oily fish contains two types of polyunsaturated omega-3 fats — eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) — these are believed to offer cardiovascular protection to both people with diabetes and the general population and may even help offset the development of diabetes (Zhang et al, 2013).

Fats have twice as many calories gram for gram than carbohydrate or protein, therefore, even with ‘healthier’ fats it is important to

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**Table 1: Glycaemic index (GI) ranking of common foods**

<table>
<thead>
<tr>
<th>Low glycaemic index (GI=55 or less)</th>
<th>Medium glycaemic index (GI=56-69)</th>
<th>High glycaemic index (GI=70 and above)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sweet potatoes</td>
<td>Pasta</td>
<td>Rice (white and brown)</td>
</tr>
<tr>
<td>Pasta</td>
<td>Pasta</td>
<td>Corn Flakes®, Rice Krispies®, Cheerios®, puffed wheat</td>
</tr>
<tr>
<td>Muesli, porridge, All-Bran®, Sultana-Bran,</td>
<td>Muesli, porridge, All-Bran®, Sultana-Bran,</td>
<td>Muesli, porridge, All-Bran®, Sultana-Bran,</td>
</tr>
<tr>
<td>Breads — rye, granary, wholegrain, sour dough, fruit bread</td>
<td>Breads — rye, granary, wholegrain, sour dough, fruit bread</td>
<td>Breads — rye, granary, wholegrain, sour dough, fruit bread</td>
</tr>
<tr>
<td>Fruit, vegetables, fruit juice, dried fruit, baked beans</td>
<td>Fruit, vegetables, fruit juice, dried fruit, baked beans</td>
<td>Broad beans, swede</td>
</tr>
<tr>
<td>Milk, soya milk, fromage frais, yoghurt, custard</td>
<td>Milk, soya milk, fromage frais, yoghurt, custard</td>
<td>Ice cream*, lower fat ice cream, rice pudding*/lower fat rice pudding</td>
</tr>
<tr>
<td>Chocolate*</td>
<td>Chocolate*</td>
<td>Jelly beans/babies, Luxorade</td>
</tr>
</tbody>
</table>

*Regardless of GI, the foods with an asterisk are high in fat/low in nutrients and so should only be eaten occasionally.

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**Five-minute test**

Answer the following questions about this article, either to test the new knowledge you have gained or to form part of your ongoing practice development portfolio.

1 – What is a common definition of type 2 diabetes?
2 – Why do people with type 2 diabetes experience high blood sugar levels?
3 – How does diet affect the patient with type 2 diabetes?
4 – What is the correct amount of carbohydrate for someone with type 2 diabetes to eat?
5 – List five practical ways in which nurses can advise people with type 2 diabetes about diet.
Staying well-nourished can be a challenge for patients who have difficulty chewing or swallowing. Those on a puréed diet are faced with:

• Messy and dissatisfying results
• Reduced nutritional content
• Time-consuming food preparation
• The danger of not blending to a safe consistency
• Reduced choice – unable to enjoy high-risk foods like peas

Unsurprisingly, patients can often lose their desire to eat and may try to avoid mealtimes altogether.

The good news is there is a more appetising alternative...

Beef & Gravy
with mashed potato and peas

Blended at home for people with dysphagia

Made in a blender at home
Staying well-nourished can be a challenge for patients who have difficulty chewing or swallowing. Those on a puréed diet are faced with:

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monitor portion sizes in people with type 2 diabetes.

Compared to the effects of being overweight or eating too much saturated fat, cholesterol from food has only a slight influence on blood cholesterol and fat content (NHS Choices, 2014b). Therefore, in the UK most health professionals do not give specific advice about limiting high cholesterol-containing foods (even in eggs and shellfish) (NHS Choices, 2014c). However, this may be necessary in some cases if there is a family history of high cholesterol.

**SALT**

Because of the increased risk of cardiovascular disease in people with diabetes, it is particularly important that salt intake is kept to below 6g a day (about a teaspoonful) (Klein et al, 2004). About 75% of the salt in the average diet comes from manufactured food, including bread, breakfast cereals and ready meals (NHS Choices, 2013a). For this reason, it is important to examine food labels and calculate the amount of salt contained in products. Similarly, community nurses should advise people with type 2 diabetes to try and limit their daily intake of salty foods such as bacon and cheese (Food and Drink Federation, 2013).

**FIBRE**

The recommended amount of fibre in the UK is 24g a day, but the average UK population average is a third less than this (NHS Choices, 2013b). There are two types of fibre, insoluble and soluble — insoluble fibre is important in health as it helps prevent constipation; however, soluble fibre is particularly important in type 2 diabetes as it has been shown to lower cholesterol levels, improve glycaemic control and reduce hyperinsulinaemia (Chandalia et al, 2000). Soluble fibre includes foods such as oats, beans and pulses, fruit, root vegetables, and linseed.

**CONCLUSION**

The dietary aim for people with type 2 diabetes is to help bring their blood sugars to a more normal level, to avoid wide fluctuations in blood sugar levels, and to help reduce the incidence of complications such as heart disease.

The diet and lifestyle advice that community nurses should provide for people with type 2 diabetes is the same as that for the general population, the only difference being that there is more urgency required in the person with type 2 diabetes if he or she is to bring the condition under control. Although a diet with a low GI carbohydrate intake may be useful for the whole population, it may be more pertinent for people with diabetes as it can help to control blood sugar levels and may help with weight loss.

It is vital that community nurses have a grasp of the basics of type 2 diabetes and the effect of diet, as only then can they offer useful lifestyle advice to patients, family and carers alike.

**REFERENCES**


Food and Drink Federation (2013) Food and Drink Labelling: A tool to encourage healthier eating. Available at: http://www.idf.org.uk/corporate_pubs/Food_Drink_
Beef & Gravy
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