Healthy Eating and Diabetes

Fact Sheets - Users Guide

5th Edition 2010

Government of South Australia
SA Health

Fact Sheets – Users Guide

Contents

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Purpose of the fact sheets

These fact sheets have been designed for use by doctors, dietitians, diabetes educators and health workers. Target clients are adults with **type 2 diabetes**; the fact sheets do not provide adequate information for clients with type 1 diabetes. People with type 1 diabetes should always be referred to a dietitian for more detailed and personalised education.

Objectives

1. **To provide initial, basic dietary advice, to help clients start making appropriate changes in their diets prior to more 'in-depth' dietary education.**
2. **To provide a means of making a preliminary dietary assessment.**
3. **To promote continuity of dietary education between the doctor, diabetes educator and dietitian.**

Wherever possible, it is highly recommended that all people with diabetes be referred to a dietitian for more detailed, personalised dietary education. This is especially important for:

- children
- pregnant women
- people on insulin
- people with other special dietary requirements, such as those with renal disease, cancer, food intolerance, hyperlipidaemia or coeliac disease
- people who are having difficulty losing weight, or achieving adequate control of blood glucose levels
- people who have difficulty gaining weight or are underweight.

See 'Resources' (page 14) for access to your local dietitians.

Those who do not have access to a dietitian will need further dietary education from their doctor or diabetes educator. Some extra dietary fact sheets on specific topics such as Sweeteners, Eating out, Goal Setting and Alcohol, which may assist health professionals in this task have been included. This material may be printed and photocopied to give to clients as required.

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How to use the fact sheets

1. Discuss ***'Guidelines for Healthy Eating',*** to give a general overview so clients understand there is more to healthy eating than just reducing sugar.

2. Outline '***Good Food Choices'***, and indicate how they fit into a daily healthy eating plan. Briefly outline the types of foods which can be eaten. Many people will find it very reassuring to see that they can still eat most foods, such as bread, potato and fruit. An example meal plan has been included in this handout to show how to put these foods together to make up meals.

3. Use the '***Checklist***' to identify foods high in added sugar and high in fat. Indicate alternatives. Ask clients to identify high added sugar or high fat foods eaten frequently (at least once every week). Mark these foods and explain suitable alternatives. Marking the foods eaten has a number of important functions:
   - The pattern and frequency of the marked foods assists you to make a preliminary dietary assessment.
   - The main needs for dietary change are clearly highlighted for the client.

   Another option, if time is limited, is to ask the client to go through and mark the Checklist at home, and review it later.

Arrange follow-up

Make a follow up appointment with a dietitian for more detailed education.

Ask the client to fill in the 3-day Food Record sometime during the next few weeks. They can bring to the follow up appointment as this will help determine whether appropriate changes are being made, or whether further support may be needed.

Client information sheets

Hand out relevant client fact sheets. These can be photocopied and handed out to clients as appropriate, however try not to overload them with too much information at once.

Understanding Diabetes

What is diabetes?

Diabetes is a condition where the body is unable to control the level of glucose in the blood. Glucose is an essential fuel for the body and it provides the body with energy on a day to day basis. Glucose comes from a range of foods called carbohydrates. These foods are essential for health and include breads and cereals, milk, yoghurt, fruit, starchy vegetables and legumes. Glucose also comes from table sugar and sweetened foods and drinks. When these foods are eaten or drank, they are broken down into glucose through normal digestion and used as fuel for the body.

If there is a problem with the production of insulin (insulin deficiency) or how well the insulin is able to do its job (insulin resistance), then blood glucose can rise above healthy levels. High blood glucose over time can cause short term problems (tiredness, frequency of urination, urinary tract infection, poor healing etc), and long term problems (heart attack, stroke, eye damage, kidney failure and lower limb and foot problems). Keeping blood glucose in a healthy range has short and long term benefits. Controlling blood glucose is done by balancing healthy eating, activity and medication/insulin.

Type 1 diabetes usually develops in young people (children and adolescents) but can develop at any age.

- It makes up about 10 - 15% of all people with diabetes.
- It is caused by an auto immune response that destroys the insulin producing cells in the pancreas.
- No endogenous insulin is secreted.
- Insulin is required from diagnosis and lifelong multiple insulin injections or insulin pump therapy is needed.
- Insulin must never be ceased.
- It is not lifestyle dependant although healthy eating and activity are encouraged.

Type 2 diabetes usually develops in people over 40 years of age, but can develop in younger adults and some children.

- It makes up about 85-90% of all diabetes.
- It occurs because of a combination of decreasing insulin production and increasing insulin resistance.
- Age and family history of type 2 diabetes are the strongest risk factors.
- Being overweight is a contributing factor in at-risk individuals.
- Lifestyle (healthy eating and activity) plays an important role in life long management.
- People progress to tablets and then insulin as part of the natural progression of type 2 diabetes.

Treatment: Maintaining a healthy lifestyle that includes healthy eating and regular physical activity. Tablets and/or insulin will be needed in most cases as the condition progresses.

Healthy eating guidelines for diabetes:

The aims of dietary management of diabetes are to[1]:

- Attain and maintain optimal metabolic outcomes including:
  - blood glucose levels (BGLs) in the normal range or as close to normal as is safely possible, to reduce the risk of complications
  - lipid profile that reduces risk of macrovascular disease
  - blood pressure (BP) levels that reduce risk of vascular disease.
- Prevent and treat the complications of diabetes.
- Improve health through healthy food choices and physical activity.
- Address individual nutritional needs.

Weight

Being well above your most healthy weight range is unhealthy and particularly so in diabetes. Obesity is often associated with insulin resistance, and approximately 80% of people who develop type 2 diabetes are above their most healthy weight. For many of these people weight loss will result in the normalisation or improvement of blood glucose levels (BGL'S).

It is not usually necessary to achieve an 'ideal weight', as even a modest loss (eg 5-10% of body weight) can be sufficient to improve BGL's, and may be a more realistic goal. Encourage clients to set their own goals regarding their weight.

Fatty foods and alcohol, as well as foods high in added sugar are particularly high in energy (calories/ kilojoules). Reducing these can assist in reaching one's most healthy weight. Regular exercise helps to control both weight and appetite.

Reduce added sugar

Refined foods, high in added sugar, are best limited as they can cause raised BGL's. A high added sugar intake may also contribute to high triglyceride levels and being above one's most healthy weight. However, foods that contain small amounts of sugar are usually acceptable – this applies to many commercial food products – eg Weetbix, baked beans and canned beetroot.

Refer to 'Carbohydrate foods and the Glycaemic Index' section on page 11.

Learning to read labels correctly is important as this helps the client determine whether sugar and fat are major ingredients and enables the person to choose the most suitable product. A client information sheet on label reading is included as part of these fact sheets.

Reduce fat

Fat, in particular saturated fat and trans fat, should be limited not only for weight control but also to help reduce blood cholesterol levels and the risk of heart disease.

It is advisable for people with diabetes to have their blood lipid levels measured and to seek medical advice if any levels are not within the desired range.

Regular, moderate intake of high-fibre, slowly digested carbohydrate food

A regular moderate intake of high fibre and slowly digested carbohydrate food, spread over three meals a day can assist in reducing fluctuations in BGL's over the day. Some people may need mid-meal snacks, particularly those treated with some types of insulin (day time isophane).

Choosing the type and amount of carbohydrate is an important factor in controlling BGL's. Unrefined, high fibre and slowly absorbed carbohydrate foods are recommended. Particularly good choices include dried beans and lentils, oats, barley, pasta, whole grain bread, low fat milk, low fat yoghurt and most fruit. These foods have a low or moderate glycaemic index.

Reduce alcohol

Alcohol is high in energy (kilojoules/calories) and in large amounts it can contribute to weight gain. It can also inhibit the body's response to hypoglycaemia, because alcohol reduces the liver's capacity to release stored glucose into the blood stream. Alcoholic drinks that are high in added sugar can increase BGL's.
The recommendations for alcohol consumption are no more than 2 standard drinks on any day[2]. A standard drink contains 10g of alcohol eg 285ml of full strength beer, 425ml of light beer, 30ml spirits or 100ml wine.

Alcohol should **always** be consumed with a carbohydrate based meal or snack (eg cracker biscuits or bread). For people with unstable diabetes, high blood lipid levels or other health conditions, encourage only 1 to 2 drinks on special occasions only. Alcohol can also interact with certain medications so clients should be advised to speak to their doctor about their use of alcohol.

Limit salt

Approximately 30% of Australians are prone to high blood pressure. Limiting salt intake is one aspect of controlling high blood pressure, along with aiming for your most healthy weight, alcohol restriction and drug therapy.

People who have diabetes and high blood pressure are at a much greater risk of developing complications such as vascular disease, kidney damage or eye damage.

Australian Dietary Guidelines for Adults [3]

The Dietary Guidelines for Australians promote good health and good nutrition for all Australians. A dietitian can help to tailor these guidelines to individual needs.

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The Dietary Guidelines for Australians are designed to help people choose foods for a healthy lifestyle. The guidelines are:

Enjoy a wide variety of nutritious foods

- Eat plenty of vegetables, legumes and fruits.
- Eat plenty of cereals (including breads, rice, pasta, and noodles), preferably wholegrain.
- Include lean meat, fish, poultry and/or alternatives.
- Include milks, yoghurts, cheeses and/or alternatives. Reduced-fat varieties should be chosen, where possible.
- Drink plenty of water.

Take care to:

- Limit saturated fat and moderate total fat intake.
- Choose foods low in salt.
- Limit your alcohol intake if you choose to drink.
- Consume only moderate amounts of sugars and foods containing added sugars.

In summary the best eating plan for diabetes is one which:

- limits added sugar and foods high in added sugar
- contains adequate amounts of carbohydrate foods – especially those which have a low GI – eg wholegrain cereals and bread, most fresh fruit, legumes, corn, milk, and yoghurt
- is low in fat, particularly saturated fat and trans fat
- is low in salt
- is high in fibre
- includes regular meals
- contains moderate amounts of protein foods such as lean meat, chicken or fish, lentils and pulses are a recommended alternative
- limits alcohol intake.

The best eating plan for diabetes is a healthy eating plan, which is suitable for all the family.

Prevent weight gain: be physically active and eat according to energy needs.

Care for food: prepare and store it safely.

Encourage and support breast-feeding.

It is important to choose a diet from a variety of healthy foods to make sure the body gets all the nutrients it needs to stay fit and healthy. Limiting food choices can mean missing out on important nutrients.

There are also specific Dietary Guidelines for Children and Adolescents. See: www.nhmrc.gov.au/Publications/Subjects/Nutrition and Diet

A dietitian can provide practical, expert and individual advice on how to incorporate the Dietary Guidelines into every day eating.

Healthy weight

People should be encouraged to aim for their most comfortable healthy weight. Providing individualised dietary advice and encouraging activity can assist people to achieve their lifestyle goals.

Encourage people to work on one change at a time. Encourage achievable goals, remembering that behavioural changes can assist people in achieving their most healthy weight. Discuss with people the amount of 'non-hungry eating' they are doing. In other words, the eating they are doing when they are not physically hungry.

Too much non-hungry eating throws peoples eating patterns out of balance and causes weight gain. If the amount of eating that people do when they are not physically hungry is decreased, most people can still enjoy a wide range of foods of different tastes, textures and fat and sugar content and still reach and maintain a healthy comfortable weight.

Offering ongoing support or recognising when to refer onto other health professionals is crucial.

Exercise/Activity

Why is exercise important?

- **Exercise improves the action of insulin**
- A major factor in type 2 diabetes is a poor response of the body to insulin. It has now been clearly shown that regular physical activity can improve the body's sensitivity to insulin. People who are more active are at a lower risk of developing type 2 diabetes than inactive people.

- **Exercise helps control BGL's**
- Regular physical activity helps control blood glucose levels (BGL's) by burning up energy and making the insulin more effective. This also assists in reducing weight.

- **Exercise improves muscle tone and heart function**
- Circulation and lung capacity can improve with regular exercise. Exercise can lower the 'bad' LDL cholesterol, reducing the risk of developing cardiovascular disease.

- **Exercise helps lower blood pressure**
- The reduction of blood fats and improvement in heart function help lower blood pressure.

- **Exercise can improve well being**
- Many people find that exercise relieves tension. It can also be a good social activity (eg if part of an exercise group or club).

How much exercise?

The recommendation for physical activity for adults is at least 30 minutes of moderate exercise on most days of the week [5]. The 30 minutes can be broken up into three 10 minutes sessions a day. Moderate-intensity activity will cause a slight, but noticeable, increase in breathing and heart rate. A good example is brisk walking that is at a pace where one can comfortably talk but not sing.

What kind of exercise?

Below are suggestions that can be made to the client to increase their activity:

> Include exercise in your daily routine. Use the stairs instead of the lift or elevator when you're only going up one or two floors. Take brisk, regular walks or use your bicycle whenever you can, to the shops, deli or church, instead of hopping into your car. This will benefit not only you but also the environment.

> Choose an activity that you will enjoy and want to continue. Walking, golf, croquet, bowls, tennis, swimming and cycling are among those that are safe and readily accessible to most people.

> Exercise groups or classes can be an enjoyable way of exercising. It is helpful to consult an instructor to find a level to suit you and then build up gradually. Contact your local council to find out about exercise classes in your area. See www.activeageingsa.net.au/resource.html for information on physical activity options in various South Australian council areas.

Footwear and foot care

All people with diabetes are at risk of foot problems and should be assessed at regular intervals. It is important that people receive appropriate advice about foot care based on their level of risk. It is also important that the person knows if they have reduced sensation and/or blood supply in their feet.

Before starting a walking program;

- have feet assessed
- provide education appropriate to the level of risk
- encourage clients to examine their feet after extended activity
- see a doctor or podiatrist if there is any swelling, signs of infection or pain

Managing diabetes during exercise

Each person's response to exercise is different, so it is important to encourage clients to determine their own response and work out their own way of varying food intake, insulin or tablets (they should do this in conjunction with a health professional).

Managing blood glucose levels

Depending on the type of diabetes, treatment and the intensity of the physical activity, food intake and/or medication may need to be adjusted. People with diabetes who take insulin injections or sulphonylurea tablets are at risk of hypoglycaemia during and/or after exercise, especially if the activity level is intense or for a long duration. Extra carbohydrate may need to be eaten before exercise or during exercise (especially if exercising for long periods). Blood glucose levels are the guide to whether this is needed. Some individuals may need adjustments in their insulin or medication regime. Close monitoring of BGLs is advised, especially if undertaking a new activity. In all cases, it is important for the client to discuss their exercise plan with their doctor or diabetes educator before commencing.

Some important precautions for clients

- **Check up** – before starting an exercise program, individuals should have a check up with their doctor.
- **Make a good beginning** – encourage a warm up before exercise. Exercise should be started slowly and set a pace that is right for the individual.
- **Monitor blood glucose levels** – advise clients to monitor their BGLs before and after exercise, especially when starting. Tests may need to be considered during exercise if exercise is prolonged – eg bushwalking.
- **Be cautious of low blood glucose levels** – the responses to low blood glucose levels such as sweating and palpitations may be confused with the response to exercise. Advise clients to take steps to avoid low blood glucose levels and always carry extra carbohydrate to take if warning symptoms develop– eg glucose tablets or jelly beans.
- **Retinopathy** – individuals with retinopathy may need to avoid strenuous exercise until their eye specialist indicates that retinopathy is stable.
- **Wear medical identification** – remind clients to always do this.

Carbohydrate foods and the glycaemic index

Advice given in the past, and still used by many health professionals, has been to recommend the use of “complex” unrefined carbohydrate in preference to “simple”, refined sugars because the sugars were believed to cause rapid, high rises in blood glucose levels.

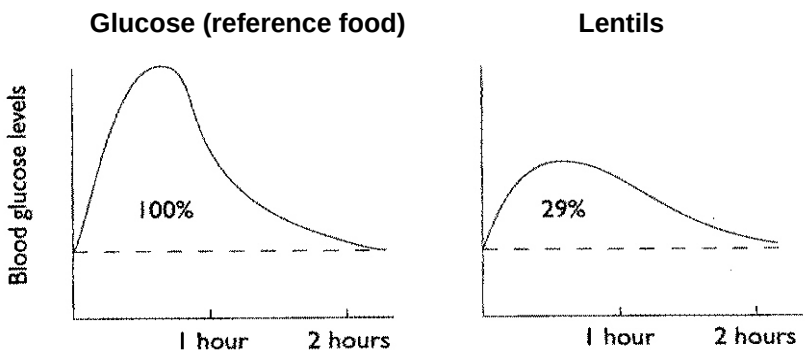
Research into carbohydrate now shows that the glycaemic response to foods can not be predicted solely by sugar content. For example, the glycaemic response to sucrose (table sugar), shortbread, icecream and chocolate is lower than that of boiled potato, many breads and rice.

The Glycaemic Index (GI) is a standardised method developed to assess and classify the glycaemic responses of carbohydrate-containing foods. The GI is a system that ‘ranks’ foods according to the rate at which the carbohydrate in the food is digested and absorbed into the bloodstream as glucose. Individual subject’s glycaemic responses to a food containing 50g of carbohydrate are measured and compared to glucose. Examples of the GI of some foods are listed below:

AllBran	44
Puffed wheat	80
Cornflakes	77
Apples	38
Grapes	53
Pineapple	59
White bread	71
Basmati rice, white, boiled	58
Jasmine rice, white, long grain, cooked in rice cooker	109
Spaghetti	44
Skim milk	30
Lifesavers (peppermint)	70
Fructose, pure	19
Sucrose	68
Glucose	100

Graph of glycaemic response to lentils compared to glucose

With lower GI foods, the carbohydrate is digested and absorbed slowly into the bloodstream.



Factors influencing GI

The GI of a food depends on many factors including the amount and type of fibre (soluble or insoluble), the fat content and the method of food preparation and processing.

For example, oats contain more fibre (mostly soluble) and are processed to a lesser extent than rice bubbles. This may explain why oats have a much lower GI than rice bubbles. Fruit grown in temperate zones such as plums, pears and apples have a lower GI than fruits grown in tropical zones such as melons and pineapple. This difference may be related to the ratio of glucose to fructose and / or the type of fibre in the fruits.

Low GI foods may assist in:

- improved diabetes control
- weight control (more satisfying)
- sports endurance (low GI foods may prolong endurance if consumed prior to exercise)
- lowering of triglycerides and cholesterol (many are high in soluble fibre)

Note that the inclusion of low GI foods at one meal may have a beneficial effect on blood glucose levels at the next meal.

Glycaemic Load

When carbohydrate foods are eaten they cause blood glucose levels to rise and fall. Blood glucose levels are affected not only by the quality of carbohydrate food (glycaemic index) but also from the quantity of carbohydrate food ingested. When these two factors are combined (type & amount of carbohydrate) the term is called 'glycaemic load'. The glycaemic load of a food is calculated as follows:

$$\text{Glycaemic Load (GL)} = \frac{(\text{GI} \times \text{Carbohydrate per serving})}{100}$$

E.g. 1 medium pear has a GI of 38 and contains 15g of carbohydrate

$$\text{GL} = \frac{38 \times 15}{100} = 5.7$$

The higher the glycaemic load the larger the effect on blood glucose levels. By choosing the lower GI option within each food group or category you automatically get the one with the lower GL so there is no need to calculate it each time. However, always choose low GI healthy foods but be aware of how much the person is eating, too much of a low GI food can still raise blood glucose levels.

Low GI carbohydrate foods - examples

- *dried beans, peas and lentils (legumes)*
- *spaghetti and pastas*
- *barley, buckwheat, cracked wheat (bulgar)*
- *Doongara clever rice*
- *wholegrain breads and breakfast cereals, eg oat bran, *All Bran, wholegrain bread, pumpernickel bread*
- *most fruits – eg apples, pears, plums, grapefruit, oranges, peaches*
- *milk and yoghurt*

* registered brand name

Sucrose

Recommendations for the use of sucrose (cane sugar) in the meal plan for people with diabetes have evolved from 'complete avoidance' to 'modest amounts may be acceptable contingent with metabolic control and body weight'.

Contrary to what is commonly believed, foods that have been sweetened with added sucrose may have a lower GI than unsweetened foods. For example, All-Bran (which contains 14% sugar) has a lower GI than Vitabrits (which has no added sugar). This may be due to different processing, amount of fibre and absorption rates of the two products. Small amounts of sucrose can be incorporated into a high fibre, low fat eating plan, for example a scrape of jam on wholegrain toast, a small slice of homemade low fat, high fibre cake, canned baked beans with added sugar, canned corn, and canned beetroot.

Conclusion

Low GI foods can have many beneficial effects on health, including improved diabetes control and lipid levels. In the context of the healthy diet for diabetes – eg moderate carbohydrate, low fat (especially low in saturated fat), it is recommended that people include low GI foods regularly in their meal planning. In particular, the inclusion of one or more low GI foods can help slow the absorption of glucose from the whole meal.

Low GI foods may be particularly useful for people who have problems with frequent episodes of hypoglycaemia. A dietitian can help advise clients on the best way to incorporate low GI foods to help achieve better control.

Resources

Where to find a dietitian

Dietetic services (on an individual basis or in a group setting) are desirable for most people with newly diagnosed diabetes, for help in changing their dietary habits and choosing appropriate new eating patterns.

Dietetic advice is available from dietitians in public hospital outpatient services, community health services and dietitians in private practice.

Fully qualified dietitians are eligible for membership of the Dietitians Association of Australia. Look for an APD (Accredited Practicing Dietitian).

Dietitians in private practice

Dietitians in private practice are listed in the Yellow Pages under 'dietitians' or you can call the Dietitians Association of Australia (DAA) on 1800 812 942. Look for an APD (Accredited Practicing Dietitian).
See DAA website (www.daa.asn.au) under Find an APD.

The cost of private dietetic advice is partially refundable through the extras table of most health insurance funds.

Your general practitioner can also refer you to see a dietitian as part of a Care Plan under Medicare. Discuss your eligibility with your GP. A small gap fee may apply.

General healthy eating resources for clients

The Australian Guide to Healthy Eating, Commonwealth Dept of Health and Family Services
Allan Borushek's Pocket Calorie, Fat and Fibre Counter, 2010 Edition
Dietary Guidelines for Adults, NHMRC, 2003
Diabetes Manual (7th Ed), Diabetes Outreach, 2009
The Low GI Shopper's Guide to GI Values, Professor Jennie Brand-Miller, Kaye Foster-Powell, Fiona Atkinson (2010 edition).

References

1. American Diabetes Association, Position Statement. Evidence Based Nutrition Principles and Recommendations for the Treatment and Prevention of Diabetes and Related Complications. Diabetes Care; 2S: S50 – S60; 2002.
2. Australian Government National Health & Medical Research Council. Australian guidelines to reduce health risks from drinking alcohol, 2009.
3. National Health and Medical Research Council, Dietary Guidelines for Australian Adults, Commonwealth of Australia, 2003.
4. World Health Organisation, BMI Classification, 2006.
5. Australian Government Department of Health and Aging, National Physical Activity Guidelines for Adults, 2005.

Useful websites:

Diabetes Australia
www.diabetesaustralia.com.au

Dietitian's Association of Australia
www.daa.asn.au

Nutrition Australia
www.nutritionaustralia.org

The National Heart Foundation
www.heartfoundation.com.au

University of Sydney Glycemic Index Research Service
www.glycemicindex.com

Commonwealth Scientific and Industrial Research Organisation (CSIRO)
www.csiro.au

Foodwatch
www.foodwatch.com.au

NHNMRC
www.nhmrc.gov.au/Publications/Subjects/Nutrition and Diet

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