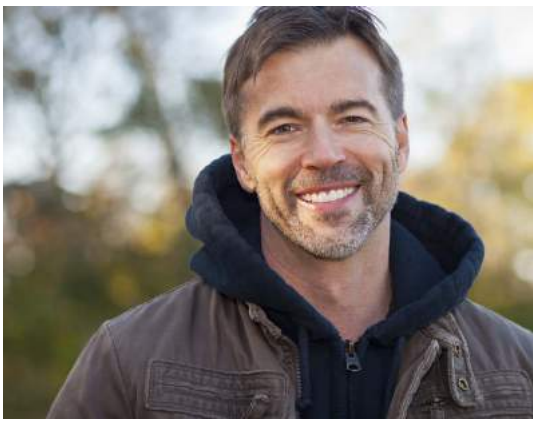
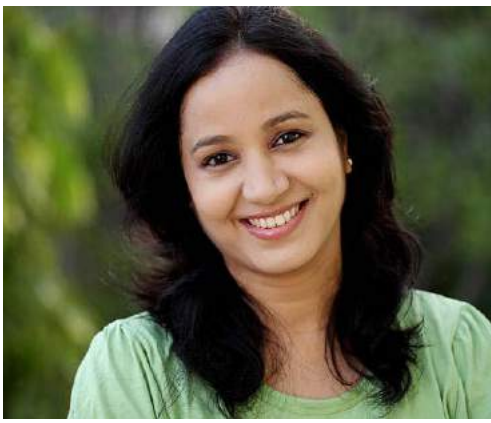
DIABETES
FACT SHEET

- ✓ Different types of Diabetes
- ✓ Why healthy nutrition and exercise is so important
- ✓ What you should know BEFORE you start exercising
- ✓ What you should know DURING exercise
- ✓ What you should know AFTER exercise
- ✓ Warning signs to STOP exercising





active8me
EXERCISE. NOURISH. THINK. TRANSFORM.

WHAT is diabetes?

Diabetes is the name given to a disease where the body's ability to produce or respond to the hormone insulin is impaired. (That is, in people with diabetes, the pancreas doesn't produce enough insulin or there is a problem with how the body's cells respond to it). The result is abnormal metabolism of carbohydrates and higher than normal levels of glucose (a type of sugar) in the blood.

These elevated levels of glucose in the blood can be potentially dangerous if not managed through lifestyle modification and appropriate medication.

There are different types of diabetes. The three main types of diabetes are type 1, type 2 and gestational diabetes. They are all complex and serious conditions.

Type 1 diabetes

People with type 1 diabetes (previously known as insulin-dependent) cannot sufficiently produce insulin and therefore require daily administration of insulin, via injections or pump. The cause of type 1 diabetes is not known and it is not preventable with current knowledge. It can appear at any age, but most commonly in childhood and early adult life.

Symptoms include excessive urination (polyuria), thirst (polydipsia), constant hunger, unexpected weight loss, vision changes and fatigue. These symptoms may occur suddenly.

Type 2 diabetes

Type 2 diabetes (formerly called non-insulin-dependent) results from the body's ineffective use of insulin. **Type 2 diabetes comprises 90% of people with diabetes around the world.**[1]

(Refer the World Health Organisation Diabetes Fact Sheet 2015 - http://www.who.int/mediacentre/factsheets/fs312/en/)

It is one of the major consequences of obesity and a lack of physical activity. Changes to our diets and the food supply, combined with more sedentary work and less activity are contributing to the rise in type 2 diabetes across the world. Some populations are at higher risk because they are genetically susceptible (eg. Asian, Indian, Pacific Islander, Aboriginals).

Symptoms may be similar to those of type 1 diabetes, but are usually less marked and happen over a longer period of time. As a result, the disease may be diagnosed several years after onset, once complications have already arisen. Until recently, this type of diabetes was seen only in adults but it is now also occurring in children and adolescents.

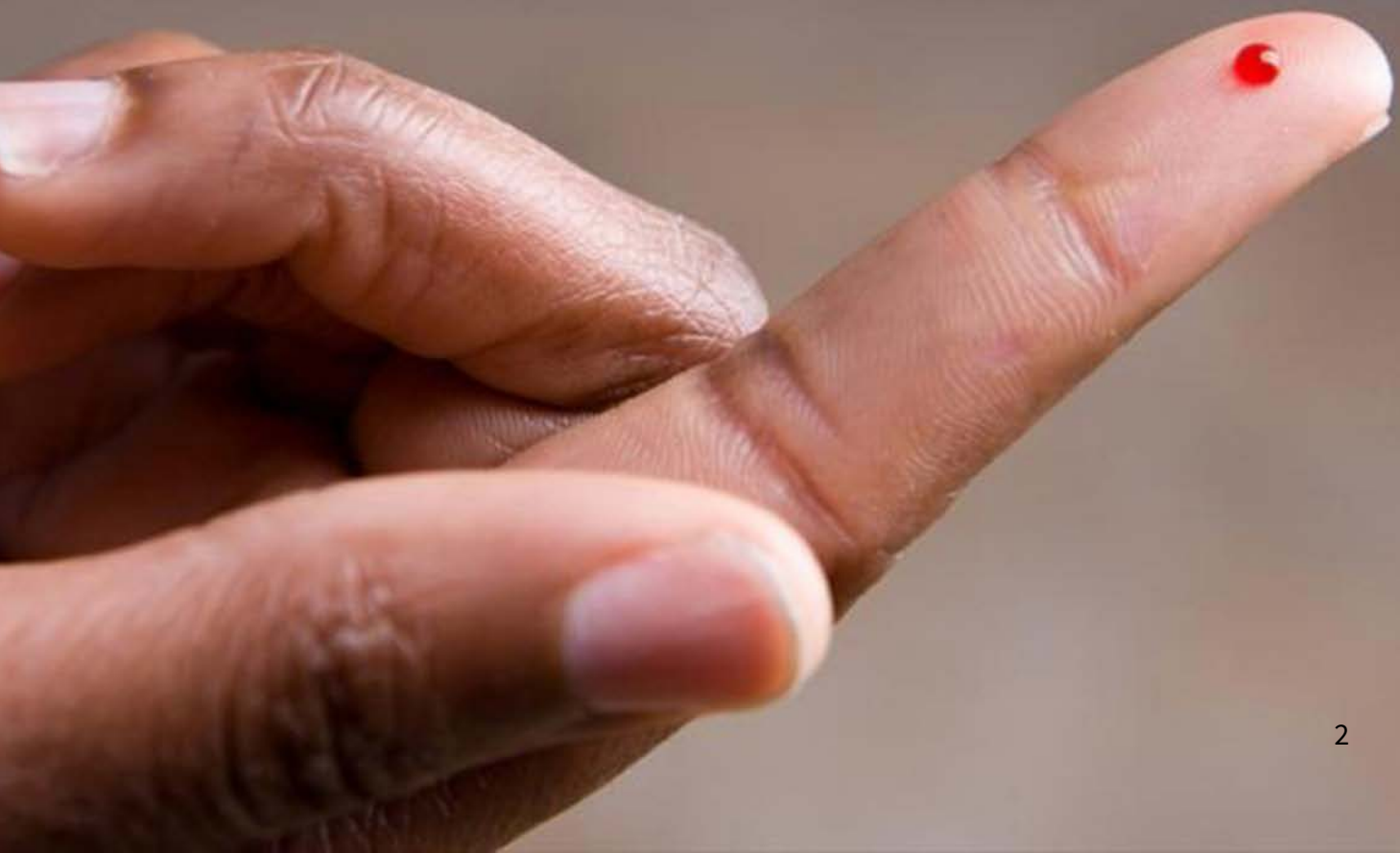
Gestational diabetes

Gestational diabetes is a form of diabetes that occurs during pregnancy. It occurs when the body becomes more insulin resistant resulting in higher blood glucose levels than normal. It is diagnosed through prenatal screening, rather than reported symptoms. It usually goes away after the baby is born, but women with gestational diabetes are at an increased risk of complications during pregnancy and at delivery. They are also at increased risk of type 2 diabetes in the future.

Diabetes is **SERIOUS**

Diabetes is the epidemic of the 21st century and is recognised as the world's fastest growing chronic disease. Diabetes does not discriminate. Anyone can develop diabetes. There is currently no cure.

387 million people have diabetes. By 2035 this is forecast to rise to 592 million. In 2013, diabetes caused 5.1 million deaths globally and the number of people with type 2 diabetes is increasing in every country. And frighteningly, many people with diabetes are undiagnosed. For example, it is estimated that in South-East Asia, almost half of people with diabetes are undiagnosed.[2]



The consequences of diabetes may include the following:

Heart Disease

Diabetes increases the risk of heart attacks and strokes by up to 4 times. (In a multinational study, 50% of people with diabetes died of cardiovascular disease. Primarily heart disease and stroke).[3]

Nerve damage

Half of all people with diabetes will develop nerve damage (neuropathy). It most commonly affects the nerves to the feet and hands, but any nerves can be involved, including those that control internal organs (autonomic nerves). There is no cure. Treatment only aims to manage or ease symptoms and the risk of further complications.

Amputations

The combined effect of nerve damage and reduced blood flow increases the chances of foot ulcers and infection. This may eventually lead to limb amputation.

Blindness

Over time, high blood glucose levels from diabetes damages the small blood vessels in the retina. This can lead to blindness.[4]

Kidney failure

Diabetes is a leading cause of kidney failure and dialysis.[5]

Mental health

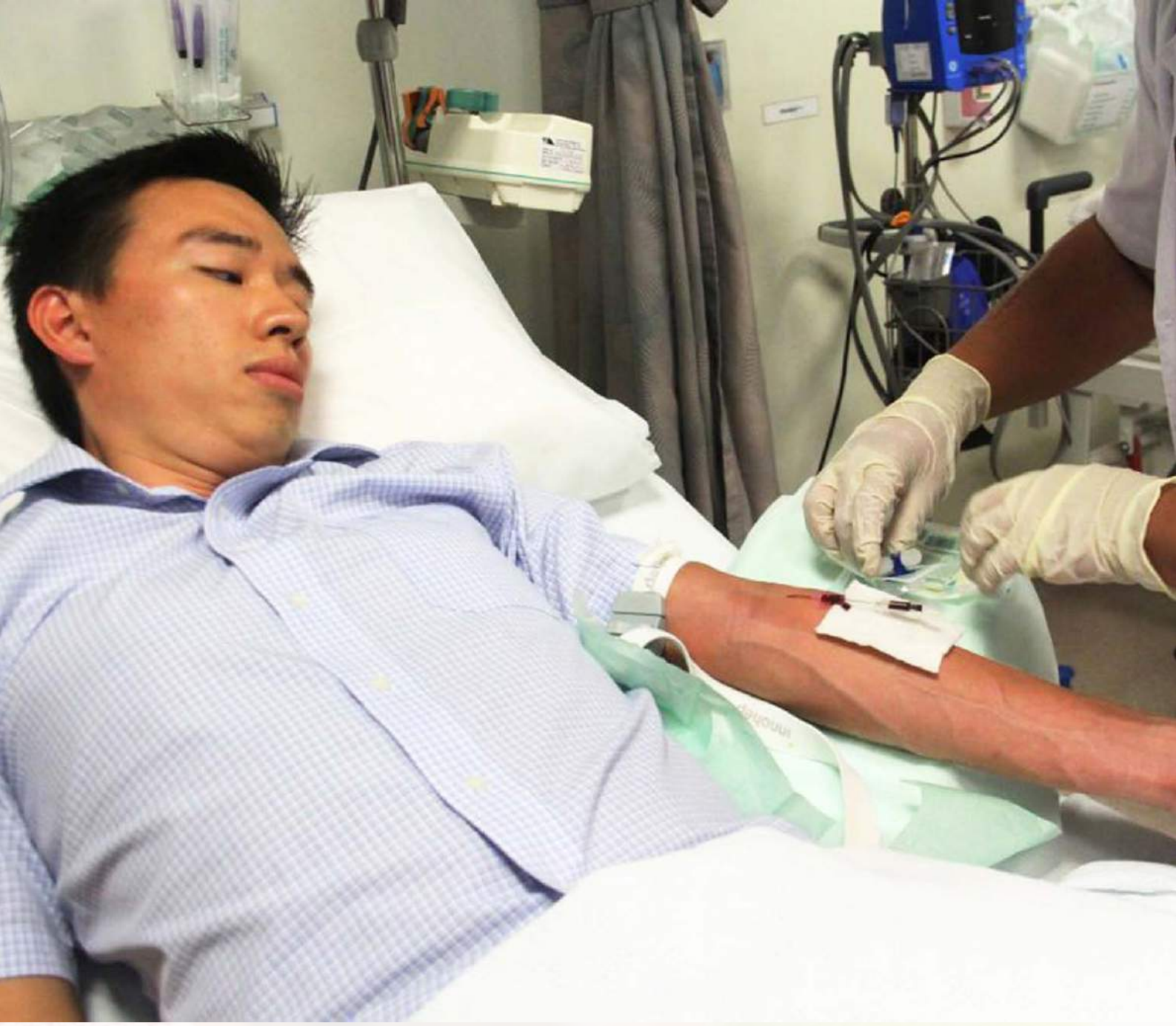
Diabetes affects mental health as well as physical health. Depression, anxiety and distress occur in more than 30% of all people with diabetes.

Increased risk of death

The overall risk of dying among people with diabetes is at least double the risk of their peers without diabetes.[6]

"Those who think they have no time for bodily exercise will sooner or later have to find time for illness".

2. Refer the International Diabetes Foundation Atlas 2014 - http://www.idf.org/diabetesatlas/update-2014
3. Morrish NJ, Wang SL, Stevens LK, Fuller JH, Keen H. Mortality and causes of death in the WHO Multinational Study of Vascular Disease in Diabetes. Diabetologia 2001, 44 Suppl 2:S14–S21.
4. Global data on visual impairments 2010. Geneva, World Health Organization, 2012.
5. Global status report on noncommunicable diseases 2010. Geneva, World Health Organization, 2011.
6. Roglic G, Unwin N, Bennett PH, Mathers C, Tuomilehto J, Nag S et al. The burden of mortality attributable to diabetes: realistic estimates for the year 2000. Diabetes Care, 2005, 28(9):2130–2135.



HOW can the burden of diabetes be reduced?

Optimal healthy nutrition, regular physical activity and maintaining an optimal body weight can prevent or delay the onset of type 2 diabetes.

These simple lifestyle measures are exactly what Active8me's programs can help you with. Healthy active living is the cheapest medicine there is. Never forget, your health is priceless as without it you have very little. You can't buy it and you can't live life to the full without it.

WHY healthy nutrition is so important for people with diabetes

A healthy diet for the management of diabetes is similar to a general healthy diet. The difference is that people with diabetes need to consider the amount, the type and the timing of carbohydrate foods they eat more carefully, in conjunction with the timing, amount and type of insulin they take. The matching and management of these two factors is the key to well-controlled blood glucose levels.

Carbohydrates are very important for people with diabetes. They have the greatest and most immediate impact on the blood glucose levels. This is because carbohydrates are digested and broken down to form sugars, which are then absorbed into the bloodstream and ultimately converted to the sugar glucose.

The amount of carbohydrate in a meal is one of the more important factors influencing blood glucose levels after a meal. Foods containing carbohydrate include breads, cereals, rice, pasta, grains such as barley and couscous, fruit and fruit juices, legumes, milk, yoghurt and some vegetables such as potato, sweet potato and corn.

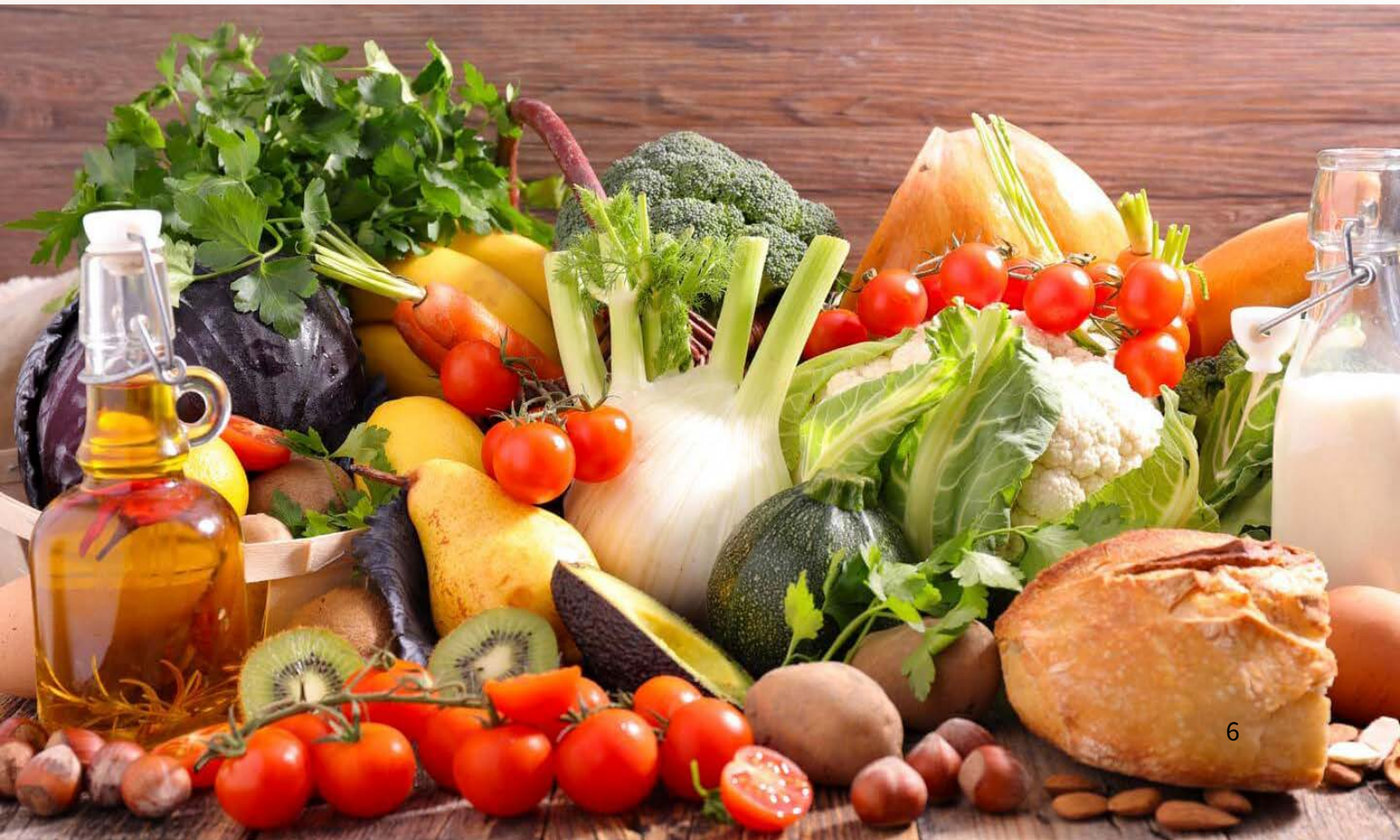
The other important factor is the 'nature' of the carbohydrate. Carbohydrate containing foods that are digested and absorbed into the bloodstream quickly (high glycaemic index[7] or high GI foods which are defined as foods with a GI over 70) will raise blood glucose levels quickly resulting in a potentially high blood glucose level. In contrast, carbohydrate foods that are digested more slowly, raise blood glucose levels more slowly, and so have a lower glycaemic index (low GI foods – with a GI less than or equal to 55). Low GI foods help to maintain consistent blood glucose levels throughout the day and may also stop you from feeling as hungry which can help contribute to weight loss and weight management.

7. The Glycemic Index (GI) ranks carbohydrate containing foods from 0-100 based on their effect on blood sugar (glucose) levels. Foods that raise blood sugar (glucose) levels more rapidly are known as high GI foods, whereas foods that raise the blood glucose levels gradually are called low GI foods

Examples of healthy, lower GI food choices include:

- ✓ **Vegetables** - eg sweet potato, yams, sweet corn.
- ✓ **Fruit** - eg apples, oranges, pears, peaches, bananas.
- ✓ **Grains** – barley, bulgur, quinoa, semolina and pearl cous cous.
- ✓ **Bread** – dense wholegrain breads, authentic sourdough bread.
- ✓ **Some varieties of rice** – eg Doongara, Basmati (parboiled and brown varieties), brown rice vermicelli
- ✓ **Legumes** – beans (e.g. baked beans, kidney beans, soy beans), chickpeas and lentils.
- ✓ **Breakfast cereals** – traditional rolled oats (e.g.porridge), natural muesli, and some high bran varieties.
- ✓ **Pasta and noodles** – all varieties made with 100% durum wheat, eg Bee hoon, Tung hoon
- ✓ **Dairy products** – reduced or low fat milk and yoghurt.

It is important to remember though that eating low GI carbohydrates and making good carbohydrate choices should not be used in isolation. These choices will help with maintaining consistent blood glucose levels. However, other nutritional factors – calories/kilojoules, saturated fat, fiber, vitamins, minerals and other nutrients – as well as portion sizes are also important factors to consider. Healthy overall nutrition is the goal as this will not only assist in managing blood glucose levels, but help you nourish your body and manage your weight.



WHY exercise is so important for people with diabetes

Exercise is essential for a healthy lifestyle. But, it is even more important and beneficial for diabetics. Why?

Specifically, exercise improves the body's ability to use the glucose in the blood and improves your insulin sensitivity. When you are active, your cells become more sensitive to insulin so the body can work more efficiently. Additionally, during exercise, your cells remove glucose from the blood using a mechanism totally separate from insulin. Therefore, exercising consistently can lower blood glucose levels and improve your HbA1C[8] (an important factor to determine average blood glucose over an extended time) naturally.

Lowering your HbA1C may in turn mean you need to take fewer diabetes tablets or less insulin.

Additionally, whole body resistance and weight training strengthens your muscle tissue which is important for the regulation of blood glucose levels. This is because lean muscle mass is a particularly insulin sensitive tissue. Because glucose from your meals is absorbed primarily in your muscle tissue, the strengthening of your muscle tissue helps with insulin sensitivity. This improves elevated blood glucose levels following meals.[9]

In addition, there are all the normal positive benefits of regular exercise. These include:

- ✓ Exercise lowers blood pressure and improves cholesterol
- ✓ Exercise lowers your risk for heart disease and stroke
- ✓ Exercise burns calories/kilojoules to help you lose or maintain weight
- ✓ Exercise increases your energy for daily activities
- ✓ Exercise helps you sleep better
- ✓ Exercise helps you relieve stress, reduces symptoms of depression and supports your mental health.
- ✓ Exercise strengthens your heart and improves your blood circulation
- ✓ Exercise keeps your joints flexible.

Get the picture?

Exercise is very good for you and you'll see these benefits even if you haven't been very active before. Together with healthy nutrition, exercise can build a foundation for a healthy, active life.

As you embark on your new, active lifestyle (we hope you'll join us at Activ8me), please find the following pointers to help you.

8. The HbA1C test result reflects your average blood glucose level for the past two to three months.
9. For further information on strength training and diabetes see http://www.diabetesaction.org/site/PageServer?pagename=complementary_4_08

I'm **WORRIED** about maintaining a regular blood glucose level

Are you worried that exercising might make it harder to maintain a regular blood glucose level?

As long as you manage your glucose level and exercise with caution, not only is exercise safe and highly recommended for most people with diabetes, but it will help you manage your diabetes.

WHAT you should know **BEFORE** you start exercising

1. Consult your doctor

Firstly and most importantly, always consult your doctor or healthcare practitioner before beginning an exercise program. The vast majority of diabetics can safely enjoy some level of exercise or sport despite their condition. However, for some diabetics with concurrent medical conditions or complications, certain types of exercise may not be advisable, or may be limited. You need to discuss your specific situation, your medical history and the potential impact of medications on your blood glucose with your doctor as you become more active.

2. Never forget that exercise is good for you and your diabetes

Remember, exercise is good for you and beneficial for your diabetes.
Many people with diabetes worry that exercising might make it harder to monitor and maintain regular blood glucose levels? Diabetes is serious, but with good management, exercise can be safe and is highly recommended for most people with diabetes. In fact, it will help you manage your diabetes. You just need to control your glucose level and exercise with some more caution than others without diabetes.

Studies have even shown that aerobic activity such as walking, running and cycling, may help to control your condition to an extent similar to that of some oral diabetic medications.[10]

10. See HealthXChange.com.sg

3. Start slow and build up

For many, the prospect of beginning a workout routine may be intimidating. And if you're like many newly diagnosed people with type 2 diabetes, you may not have exercised in years. If that's the case, don't worry - **it's fine to start slow and work up**. At Active8me we understand this, which is why our programs cater for all levels of experience – from beginner, to intermediate, to advanced. Most exercises are safe to perform. Just listen to your body, control your glucose level and exercise with caution. **Healthy, active living to optimise your health and wellbeing is the goal!**

4. Always monitor your blood glucose levels

Glucose levels may fluctuate greatly during exercise so you need to monitor your blood glucose level before, during and after your workout. If you're taking insulin or medications that can cause hypoglycemia, test your blood glucose 30 minutes before exercising and approximately every 30 minutes during exercise. This will help you determine if your blood glucose level is stable, rising or falling and if it's safe to keep exercising. Also, if you are on insulin, you should avoid exercising during the peak insulin action.

Unless your doctor advises differently, use the following standard blood glucose levels as a guideline before you begin exercise. (These are measured in milligrams per decilitre (mg/dL) or millimoles per litre (mmol/L)).

MMOL/L	Guidance
16.7 mmol/L (300 mg/dL) or higher	Your blood glucose may be too high to exercise safely, as these high glucose levels may increase your risk of dehydration and ketoacidosis . Postpone your workout until your blood glucose drops to a safe pre-exercise range.
13.9 mmol/L (250 mg/dL) or higher	This is a caution zone. Before exercising test your urine for ketones - substances made when your body breaks down fat for energy. Excess ketones indicate that your body doesn't have enough insulin to control your blood glucose. If you exercise when you have a high level of ketones, you risk ketoacidosis — a serious complication of diabetes that needs immediate treatment. Instead, wait to exercise until your test kit indicates absence or a low level of ketones in your urine.[11]
5.6 - 13.9 (100 - 250 mg/L)	**You're good to go. For most people, this is a safe pre-exercise blood glucose range.**
< 5.6 (<100 mg/L)	Your blood glucose may be too low to exercise safely. Have a small carbohydrate-containing snack, such as fruit or crackers, before you begin your workout.

11. Diabetic ketoacidosis (DKA) is a serious condition that can lead to diabetic coma (passing out for a long time) or even death. When your cells don't get the glucose they need for energy, your body begins to burn fat for energy, which produces ketones. High levels of ketones can poison the body. When levels get too high, you can develop DKA.
For more details see http://www.mayoclinic.org/diseases-conditions/diabetic-ketoacidosis/basics/symptoms/con-20026470

5. Choose the right injection site

Choose an injection site away from the muscles that will be primarily used during your exercise. For example, if you run, do not inject the insulin into the legs. Insulin is best injected into the fatty tissue just below your skin. You should avoid injecting directly into muscle as that may result in the insulin being absorbed too rapidly which can increase the risk of hypoglycaemia during exercise.

6. Be consistent when you exercise

There's no best time of day when it comes to exercise. Pick a time that works for you and just do it. Consistency is the key here. A consistent exercise routine where you exercise at the same time can help you learn more about how exercise affects you specifically because things are more predictable. This will help you manage your blood glucose level during and after exercise. You'll learn how to predict and accommodate for the effect exercise will have on your blood glucose level.

For insulin and sulfonylurea users, because you can be at a greater risk of low blood glucose, exercising too close to bedtime can be risky. When you're asleep, you may not feel a low coming on. So, if you want to work out at night, you'll want to carefully monitor blood glucose before, during, and after exercise and before bedtime. A snack before you go to sleep may be a good idea. To be on the safe side, you may also want to check blood glucose in the middle of your sleep time (say, 3 a.m.), at least a few times while developing a regimen to be sure you're not going too low.

WHAT you should know **DURING** exercise

1. Check your blood glucose

During exercise, low blood glucose is sometimes a concern. If you're planning a long workout, check your blood glucose every 30 minutes — especially if you're trying a new activity or increasing the intensity or duration of your workout.

This is another reason why Activ8me's workout are designed to be 30 minutes duration or less. However, this may be difficult if you're participating in outdoor activities or sports. So check your blood glucose levels and get familiar with how your blood glucose responds to changes in your exercise habits.

2. Carry a snack with you in case of low blood glucose

A good idea is to always have a snack on hand in case of low blood glucose. As an example carry some jelly beans, a glucose tablet or a fruit juice. If you have type 1 Diabetes you should also ensure you carry a glucagon pen with you and train with, around or near a person trained to use it.

3. Drink plenty of fluids

As is the case for everyone, drink plenty of fluids before, after and during exercise to prevent dehydration. You should avoid alcohol and certain medications, such as beta-blockers, which increase the risk of hypoglycaemia.

4. Workout intensity

The key guide to determine how hard you should workout is your rate of perceived exertion (RPE) as opposed to any specific heart rate. RPE or the Borg Scale is a scale that determines how hard you are working based on how you feel when you are exercising. It depends on your individual fitness level.

WHAT you should know **AFTER** exercise

1. Check your blood glucose again

Check your blood glucose immediately after exercise and again several times during the next few hours. Exercise draws on reserve glucose stored in your muscles and liver. As your body rebuilds these stores, it takes glucose from your blood. The more strenuous your workout, the longer your blood glucose will be affected. Low blood glucose is possible even several hours after exercise.

2. Eat a small carbohydrate-containing snack if necessary

If you do have low blood glucose after exercise, eat a small carbohydrate-containing snack, such as fruit or drink a small glass of fruit juice if it's not time to eat a main meal.

3. Be aware of your body

It is important to always be aware of your body and your body's reaction to exercise. Working out increases your body's insulin sensitivity, making it easier for insulin to transport glucose to the cells that will use it. So listen to your body, manage your glucose level and exercise with caution.

WARNING SIGNS to stop exercising

Stop exercising if you experience the following symptoms and quickly check your blood glucose level, heart rate and blood pressure:

- ✓ You feel shaky, weak, nauseous or confused
- ✓ Light headedness or dizziness
- ✓ Chest tightness / discomfort / pain (seek immediate medical attention)
- ✓ Severe shortness of breath
- ✓ Your blood glucose is 70 mg/dL (3.9 mmol/L) or lower
- ✓ You feel sleepy

Eat or drink something to raise your blood glucose level and recheck your blood glucose 15 minutes later. If it's still too low, have another serving of food or drink to raise your blood glucose level and test again 15 minutes later. Repeat as needed until your blood glucose reaches at least 70 mg/dL (3.9 mmol/L). If you haven't finished your workout, continue once your blood glucose returns to a safe range.

Active8me was created to help you become the person you want to be. Our purpose is to empower you to take control of your life and your future and to live a healthy, active life.

Everything about Active8me is designed to help you succeed. From this Diabetes Fact Sheet to the all-in-one integrated app that we created. To give you the convenient solution for your busy life and to give you the tools you need to eat healthily, exercise effectively, and shift your mindset so you can see real and lasting change. All put together by incredible experts.

It's a journey, but we believe in you. You can do this.

Exercise. Nourish. Think. Transform.

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