Diabetes Information Sheet (English)

What is diabetes?

Insulin and tablets

Diabetes and your body

Food and nutrition

Diabetes and exercise
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1. What is diabetes?

1.1. Introduction

Diabetes is a disease.

For our bodies to work properly we need to convert sugar into energy.

With diabetes, a hormone called insulin, which is essential for the conversions of the glucose (sugar) into energy, is no longer produced in sufficient amounts by the body or the insulin produced is not working properly.

There are two main types of diabetes.

- Type 1 or insulin-dependent diabetes (Juvenile Diabetes) which usually affect children, teenagers and young adults and requires daily injections of insulin; and
- Type 2 or non-insulin dependent Diabetes (Adult-onset Diabetes), which usually affects people over the age of 45 years and is treated by healthy eating and regular exercise. Tablets and insulin injections are sometimes necessary.

This second type is the more common form of diabetes.

1.2. Type 1 diabetes

In Type 1 diabetes, the pancreas (a large gland behind the stomach) fails to produce insulin.

Without insulin, the body’s cells cannot use glucose (sugar), which the body needs for energy. It begins to burn its own fats as a substitute.

Unless treated with daily injections of insulin, a person with type 1 diabetes accumulates in the blood dangerous chemical substances from the burning of fat. This can cause a condition known as ‘keto-acidosis’.

To stay alive, people with type 1 diabetes depend on up to four insulin injections every day of their lives. They must test their blood glucose levels several times daily. This is vital to monitor the complex interaction of food and exercise with their insulin injections.

Symptoms

The symptoms may occur suddenly. If they occur, see a doctor.

- Feeling constantly thirsty
- Passing urine frequently, including bedwetting
- Excessive hunger Blurred vision
- Unexplained weakness and fatigue
- Weight loss
- Vaginal discharge or itch in young girls
- Nausea and vomiting

Through a simple test, a doctor can find out if diabetes is present.

**Cause**

The exact cause is not known. Some people are predisposed to developing type 1 diabetes. In these people, the diabetes is possibly triggered by a virus. This destroys the part of the pancreas which produces insulin.

**Treatment**

Treatment aims to do what a normal body does naturally - maintain a proper balance of insulin and glucose. Diabetes "control" means keeping the level of glucose in the blood as close to normal as possible.

The three elements of "control" for type 1 diabetes are:
- Food
- Exercise
- Insulin

**1.2.1. Keto-acidosis**

Keto-acidosis is a serious condition associated with illness or very high blood glucose (sugar) levels in type 1 diabetes. It develops gradually over hours or days. It is a sign of insufficient insulin.

Without enough insulin, the body’s cells cannot use glucose for energy. To make up for this, the body begins to burn fat for energy instead. This leads to accumulation of dangerous chemical substances in the blood called ketones, which also appear in the urine.

**Symptoms of keto-acidosis**

High blood glucose level and moderate to heavy ketones in the urine with:
- Rapid breathing
- Flushed cheeks
- Abdominal pain
- Sweet acetone smell on the breath
- Vomiting
- Dehydration

This is a medical emergency and can be life threatening if not treated properly. If these symptoms are present, contact your doctor or go to hospital.
1.3. **Type 2 diabetes**

In Type 2 diabetes, the body cells are unable to use insulin properly (insulin resistance). This causes glucose (sugar) to accumulate in the blood stream.

**Symptoms**

The symptoms come on gradually but many people with type 2 diabetes have no symptoms and are diagnosed after a blood glucose test. It occurs more frequently in people who have a family history of diabetes, are over 50 years, are overweight and rarely exercise. Symptoms include:

- Feeling tired
- Passing urine frequently
- Feeling constantly thirsty
- Blurred vision
- Itching of the skin or genital area
- Slow healing infections
- Numbness and tingling in hands or feet

**Treatment**

In many people with type 2 diabetes, healthy eating and regular exercise can control blood glucose levels. The eating and exercise plan a doctor or dietitian may suggest depends on the person’s age, lifestyle and overall health. In some cases, tablets or insulin injections may also be necessary.

1.4. **Gestational diabetes**

**What is Gestational diabetes?**

Gestational Diabetes is a form of diabetes that occurs during pregnancy and usually goes away after the baby is born. This common condition refers to a high blood glucose level recognized for the first time during pregnancy. It develops towards the middle of the pregnancy as a result of the changes in the mother’s hormones. If this condition is left untreated, it can cause complications for the mother and the baby.

**Who is at risk of developing gestational diabetes?**

Women:

- over 30 years of age
- with a family history of type 2 diabetes
- who are overweight
- from certain ethnic groups e.g. India, Asia, Pacific Islands, Middle East
**How is Gestational Diabetes diagnosed?**

Diagnosis is made after a special test. A blood test is carried out before and after a glucose drink is given. Usually, this test is performed when you are about six months pregnant.

It is recommended that all pregnant women be tested for diabetes between 26th and 28th week of pregnancy.

If you get gestational diabetes, it is best that you are cared for by a doctor who specialises in looking after pregnant women with diabetes.

**Treatment**

The treatment is based on healthy eating and regular exercise such as walking.

**Guide for healthy eating:**

- Eat a wide variety of food
- Eat regular meals and snacks such as, three moderately sized meals and three small snacks spread evenly over the day
- Include carbohydrate foods (starch) in each meal and snack such as, multigrain bread, cereals, legumes, pasta, rice, fruit and vegetables
- Avoid foods and drinks containing large amounts of sugar
- Use low fat cooking methods and choose low fat products
- Drink plenty of water

A healthy eating plan will help you and your baby. Talking to a person who specialises in healthy eating such as a Dietitian is recommended. Ask your doctor to arrange this for you.

It is important that women check that their diabetes is well controlled by doing blood tests at home each day. Your doctor or diabetes nurse will teach you how to do these tests. Aim for a blood glucose level below 7 mmol/l two hours after meals.

If healthy eating and regular exercise cannot control gestational diabetes, insulin injections will be necessary for the rest of the pregnancy. This is safe for you and your baby. Tablets for treating diabetes are not used in pregnancy.

As long as there are no other problems, the pregnancy can continue normally ending with a healthy baby.

**How will Gestational Diabetes affect my baby?**

If diabetes is not well looked after, it may cause problems such as a large baby, which makes delivery more difficult. The baby may also have low glucose levels for a short time after birth. If any problems occur, the hospital will know how to care for you and your baby.
Will my baby be born with diabetes?

No, your baby will not be born with diabetes. However, diabetes tends to run in families, so your child may develop diabetes in adult life.

What happens after your baby is born?

After the baby is born, the diabetes usually disappears.

A special blood glucose test is performed 6 weeks after delivery to ensure that blood glucose levels are back to normal. However, women who have had gestational diabetes have an increased risk of developing type 2 diabetes later in life.

To help to prevent the onset of Type 2 diabetes, it is important to:

- continue healthy eating
- stay at a healthy weight
- exercise regularly
- have your blood glucose checked every 1-2 years.

For further information, speak to your doctor or contact Diabetes Australia 1300 136 588.

1.5. The Six most asked questions about diabetes

Q. What is Diabetes?
A. Diabetes is a disease.

For our bodies to work properly we need to convert sugar into energy. With diabetes, a hormone called insulin, which is essential for the conversion of the glucose (sugar) into energy, is no longer produced in sufficient amounts by the body or the insulin produced is not working properly.

Q. Can you ‘catch’ diabetes?
A. No.

Diabetes cannot be ‘caught’ from other people. Eating too much sugar does not cause diabetes. About 800,000 Australians have diabetes, however approximately 400,000 of these don’t know it. Just because you can’t see it, doesn’t mean it’s not there. Diabetes can still cause damage to the body even in people who don’t realise they’ve got it. Early detection and treatment may prevent problems.

Q. At what age do you get diabetes?
A. Anyone can get diabetes at any age.
There are two main types of diabetes: Type 1 or insulin dependent diabetes, which usually affects young people and requires daily injections of insulin; and Type 2 or non-insulin dependent diabetes, which usually affects people over 45 years, is treated by healthy eating and regular exercise. Tablets and insulin injections are sometimes necessary. This second type is the more common form of diabetes.

Q. What types of people get diabetes?
A. Anyone may develop diabetes.

Q. How can I tell if I have diabetes?
A. The symptoms of diabetes include:

- Feeling tired
- Passing urine frequently
- Feeling constantly thirsty
- Blurred vision itching of the skin or genital area
- Slow healing infections
- Numbness and tingling in the hands or feet

Sometimes these problems come quickly, other times slowly. If any of these problems are bothering you, see your doctor who will test you for diabetes.

People with type 2 diabetes often feel unwell for long periods without knowing why.

Q. Can diabetes be cured?
A. As yet there is no cure. However, excellent treatment is available.

Diabetes can’t be cured; however it can be managed through lifestyle, tablets or insulin along with help and advice from your doctor and other health professionals.

1.6.  **Diabetes and Travelling**

**Preparation**

Preparation is vital before any trip but even more so if you have diabetes. Plan ahead by making lists.

**Medications**

You may need medication prescriptions from your doctor.

Carry your medication (insulin / tablets) in your hand luggage and in your travelling companion’s hand luggage. If you are travelling alone, keep the second set of medications in your stowed luggage.
Carry a letter from your doctor that says:
- you have diabetes
- your medication requirements
- that you are carrying needles and syringes for injection of insulin for diabetes.

**Traveller’s Survival Kit**

Pack a traveller’s survival kit that contains:
- some form of sugar (for example, lollies such as jelly beans and soft drinks)
- carbohydrate snack (for example, dried fruits, fresh fruits, biscuits, sandwich)
- blood testing equipment
- basic first aid requirements
- glucagon injection and quick-acting insulin (neutral, clear) (This is only for people with Type 1 diabetes. Speak to your doctor for advice.)
- key contact details at home and your destination
- names and addresses of diabetes services available at your destination
- phone numbers of your doctor and specialist in case you need to call them for advice
- useful phrases in the language of your destination (e.g. "I have diabetes, please give me some sugar or something to eat")
- some form of identification (Medical Alert bracelet, locket or a card saying that you have diabetes)

**Insulin users**

If travelling by air, contact your diabetes specialist or diabetes nurse for advice on how to manage your insulin dosage while flying.

**Insulin Storage**

- Pack insulin in a polystyrene container to keep it cool
- If travelling by air, wrap the container in clothing and place in the centre of your suitcase
- Insulin is not affected by airport baggage x-ray equipment
- If travelling by car, do not leave it in glove boxes, trunks of motorcars
- Do not keep insulin in the outside pockets of backpacks.

**Test frequently**

Everyone should test more frequently than usual while travelling because a different food and exercise schedule may either markedly improve or worsen your diabetic control.

**1.7. Diabetes and Driving**

If you have diabetes, you can hold a driver’s licence or learner permit as long as your diabetes is well controlled.
The main concern of the licensing authorities is the possibility of hypoglycaemia (low blood sugar) while driving. Diabetes complications like eye problems are also of a concern.

All states and territories use the national guidelines of medical fitness to assess people with diabetes who wish to begin, or continue driving. These guidelines intend to protect your safety and the safety of the community as a whole.

The guidelines attempt to balance the safety of all concerned and any unfairness against people with diabetes.

Obtaining a licence

If you have diabetes, a medical report must be provided before a driver licence or learner permit can be issued. This report should be from your treating doctor (general practitioner) or diabetes specialist.

What to do if you develop diabetes

If you develop diabetes you should inform your insurance company and check if you are required to inform the licensing authorities. If you are required to notify the authorities but don’t, you could be charged with driving offences if you have a driving accident. There may also be problems with insurance claims if your diabetes has not been reported. See your doctor for a thorough medical examination. Get a note or report from your doctor that says you are OK to drive and send this report to the licensing authorities. Discuss your driving specifically with your doctor so that you fully understand what you should do to ensure that you drive safely.

Hypoglycaemia (low blood sugar) and Driving

Hypoglycaemia can impair your ability to drive safely. Ensure that you always have something sweet and a carbohydrate snack available in your car. If you feel your blood sugar level is low, pull over immediately and stop your car. Do not restart your car until you have treated your hypoglycaemia (low blood sugar) and feel absolutely normal.

Diabetes Complications and Driving

If you have impaired vision, nerve damage or heart problems, talk with your doctor about the possible effects on your ability to drive safely.

Review of licences depends on how your diabetes is controlled (by diet, by tablets, or by insulin).

Diet control – you are not required to notify the Driver Licensing Authority and no medical examination is necessary.

Tablet treatment – you are not required to notify the Driver Licensing Authority and you may drive with an unrestricted license providing you do not have and health problems that will affect
your driving. A medical examination is required every five years to assess progress of your health.

**Insulin treatment** – you are eligible only for a conditional licence based on your treating doctor or diabetes specialist’s opinion, and the type of driving you do. The licence is reviewed at least every 2 years.

### 2. Insulin and Tablets

#### 2.1. Insulin and its role

Insulin is a hormone produced by a gland called the pancreas.

Insulin enables glucose in the blood to enter body cells such as muscles where it can be used for energy.

In the case of diabetes, the pancreas does not make enough insulin and normal levels of blood glucose cannot be maintained.

The body needs help and this may require the administration of insulin. All insulin preparations lower blood glucose levels.

Five types of insulin are available and you and your doctor will discuss which is right for you.

Key points to remember are:

- Type of insulin preparation used and daily dosage.
- The time your insulin has its maximum effect and how long it lasts for.
- Regular timing of injections and meals.
- Report to your health care professional any change in lifestyle, working hours, physical activity or meal times

#### 2.2. Injections and Injectors

The daily injection process will become routine.

Your doctor or diabetes nurse educator will teach you the correct injection and dose measurement techniques, while answering any of your treatment queries.
A wide variety of injectors and injections are available, each designed for a particular purpose and individual’s needs.

Bruising, lumps and other responses to injections can be avoided if you have the know-how.

2.3. **Self-monitoring of Blood Glucose**

You should regularly monitor your blood glucose. This will ensure your treatment is working properly and will help prevent or delay the onset of complications.

Regular monitoring of blood glucose levels need not be a hassle and plays an active part in your ability to maintain a happy, enjoyable life.

Keep asking questions about blood glucose testing and keep practicing blood testing until you feel confident and comfortable about your technique.

Several factors – including equipment faults and human error – may influence the reliability of your test results.

Record your results in a record book and take them to your diabetes advisors on each visit.

2.3.1. **Guidelines for Blood Glucose Testing**

Self blood glucose testing is a method of measuring how much sugar is in your blood. It is done by using a drop of blood from a finger. The blood is applied to a test strip, which is read by a blood glucose machine.

There are many types of machine available. It is recommended you get some advice from your doctor or Diabetes nurse to select the best one for you. You need instruction on using the machine from a qualified person.

**Why should I test?**

- It allows you to be in control of your diabetes.
- It shows if the treatment is working.
- You can see if your blood sugar level is too high or too low.
- It shows the effects of food and physical activity on your blood sugar level.

This gives you and your health team the information needed to help manage your diabetes.
When Should I Test?

Blood glucose tests may be done before meals or two hours after meals. Ask your doctor or diabetes nurse for advice on when and how often you need to test.

Test more often:
- If you are sick – increase to 2-4 hourly
- When adjusting tablet or insulin doses
- When blood glucose levels are high for example over 15 mmol/l

What should my blood glucose level be?

The normal range for blood sugar is about 3.5 to 8 mmol/l. Aim for less than 8 mmol/l most of the time.

<table>
<thead>
<tr>
<th></th>
<th>BEFORE MEALS</th>
<th>2 HOURS AFTER MEALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>IDEAL</td>
<td>4 – 6 mmol/l</td>
<td>up to 8 mmol/l</td>
</tr>
<tr>
<td>FAIR</td>
<td>6 -8 mmol/l</td>
<td>up to 10 mmol/l</td>
</tr>
<tr>
<td>POOR</td>
<td>8 or more</td>
<td>10 or more</td>
</tr>
</tbody>
</table>

These results are a guide only. The range you should aim for should be discussed with your doctor or diabetes nurse

Getting accurate blood sugar results

Accurate results depends on your machine working properly, doing the test correctly and using strips which are not out of date or damaged. This can be checked by doing a test with a special solution. This is called a control test. Ask your doctor or diabetes nurse to show you how to do this.

Common reasons for incorrect results

- Using the wrong strip for the machine
- Using strips that have expired or stored incorrectly
- Using the machine incorrectly
- Not washing hands before testing (handling sweet foods such as jam or fruit can give higher results)
- Incorrect calibration/ set up
- Not enough blood on the strip will give lower results with some machines
Care of strips

- Store in a dry place
- Replace the cap immediately after use
- Check the expiry date is valid
- Discard any discoloured strips

2.4. Testing Urine

Testing Urine for Glucose

Testing for glucose in your urine is not as accurate as testing your blood. Urine testing is an option only if blood testing is not possible.

There are various brands of strips for testing urine. Your diabetes educator will suggest which one is best for you.

2.5. Hypoglycaemia (Low Blood Sugar Level)

Hypoglycaemia occurs when your blood sugar level drops too low (usually below 4.0 mmol/l). This can only happen if you are taking insulin or certain tablets for your diabetes.

Warning Signs

You may feel one or more of the following things. These usually appear quickly.

- Shaking
- Dizziness
- Hunger
- Fast heart beat
- Tingling around the mouth and lips
- Feeling tired or weak
- Headache

If not treated or the blood sugar level goes lower, you may develop:

- Confusion
- Behaviour as if drunk
- Slurred speech
- Drowsiness which may lead to becoming unconscious
Common Causes

- Skipping or delaying meals and snacks
- Not eating enough carbohydrate (starchy) food
- Too much insulin or tablets
- Drinking alcohol without food
- Extra physical activity without eating extra food

What to do

Have some sugar quickly such as:

- 5 - 7 jelly beans
- 1 glass of soft drink (not diet)
- 1 glass of fruit juice
- 2 - 4 teaspoons of sugar or honey

If you don’t feel better in 5-10 minutes have some more sugar.

Then eat some carbohydrate (starchy) food such as:

- 1 piece of fruit
- 1 glass milk
- 1 sandwich
- 2 - 4 dry biscuits
  or
- If it is time for your meal, have it immediately.

If you are taking the diabetes medication, Acarbose (Glucobay®) you will need to take glucose tablets, glucose gel or Lucozade.

What to do if a person becomes unconscious: (This situation is not very common)

- Never give any food or fluids by mouth
- Turn the person on their side
- Call an ambulance

An injection to raise the blood sugar level called ‘Glucagon’ can be given by a family member at home. Speak to your doctor if you think this is necessary.
How to prevent Hypoglycaemia (Low blood sugar level)

- Eat your meals on time and don’t skip meals
- Make sure you eat enough carbohydrate (starchy) food at each meal
- If drinking alcohol, have it with a carbohydrate (starchy) snack e.g. pretzels, dry biscuits or bread
- Eat extra carbohydrate (starchy) food if planning extra physical activity.

Speak to your doctor or diabetes nurse if:

You cannot work out why your blood sugar level is dropping too low. The dosage of your insulin or tablets may need to be reduced.

Remember:

Always carry some form of sugar e.g. jelly beans.

Talk to your family and friends about low blood sugar levels so they know how to help you.

Carry an identification card, bracelet or necklace stating you have diabetes in case of emergency.

2.6. **Hyperglycaemia (High Blood Sugar Level)**

Hyperglycaemia means high blood sugar level. This can develop over many hours or days. It is possible for your blood sugar level to be high and not be aware of it.

If symptoms are present, they may include:

- feeling constantly thirsty
- passing large volumes of urine, frequently
- feeling tired
- blurred vision
- infections e.g. thrush
- weight loss

Common Causes of high blood sugar levels

- Sickness
- Infection
- Stress
- Too much carbohydrate food at once
- Not enough insulin or diabetes tablets
- Other tablets or medicines e.g. Cortisone
Treatment of High Blood Sugar Levels

Type 2 diabetes

It is normal for blood sugar levels to go up and down from day to day. An occasional high blood sugar level is not a problem. If your blood sugar level remains high for a few days or if you are sick, contact your doctor.

Type 1 diabetes

Contact your doctor or diabetes nurse for advice about increasing your dose of short acting (clear) insulin. You may also need extra doses of this insulin e.g. 2-4 units every 2 hours.

Keep testing your blood sugar level frequently. Test your urine for ketones every time you pass urine.

Drink extra water or low calorie fluids to keep up with fluid lost by passing more urine.

Contact your doctor or go to hospital if:

- vomiting stops you from drinking and makes eating difficult
- blood sugar levels remains high
- moderate to large ketones are present in the urine

In type 1 diabetes, high blood sugar levels can progress to a serious condition called Ketoacidosis.

2.7. Tablets and diabetes

People with type 2 diabetes are often prescribed tablets to help control blood glucose levels.

Tablets are not suitable for people with type 1 diabetes (juvenile diabetes).

If healthy eating and regular exercise does not reduce blood sugar to normal levels, tablets are necessary.

Tablets are not a substitute for healthy eating.

Overtime, tablets may no longer work and insulin injections may be needed.

Sometimes insulin injections are used in combination with tablets.

Regular blood sugar testing checks how well the tablets are working.
Tablets may cause side-effects. Speak to your doctor or diabetes nurse about this.

During illness, a higher dosage of tablets may be needed to control blood sugar levels. Sometimes insulin injections may also be required at this time.

Tablets are not suitable for treating diabetes during pregnancy.

**Types of Tablets**

Tablets to treat diabetes can be divided into 5 groups.

These tablets can be taken alone or with a tablet from another group.

1. Sulphonylureas
2. Biguanide
3. Acarbose
4. Meglitinides
5. Thiazolinediones

<table>
<thead>
<tr>
<th>Tablet Group Name</th>
<th>Tablet Trade Name</th>
<th>How it works</th>
<th>When to take</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Sulphonylureas</td>
<td>Daonil</td>
<td>This group stimulates the pancreas to produce more insulin. May cause low blood sugar level.</td>
<td>Before / with meals.</td>
</tr>
<tr>
<td></td>
<td>Euglocon</td>
<td></td>
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<tr>
<td></td>
<td>Glimel</td>
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<td></td>
<td>Diabinese</td>
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<td>Rastinon</td>
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<td>Diamicron</td>
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<tr>
<td></td>
<td>Minidiab</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Melizide</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Biguanides</td>
<td>Diabex</td>
<td>This group helps insulin work better. Unlikely to cause a low blood sugar level unless taken with a tablet from the sulphonurea group or insulin.</td>
<td>With / after meals.</td>
</tr>
<tr>
<td></td>
<td>Diaformin</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Glucophage</td>
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<td></td>
</tr>
</tbody>
</table>
### 3. Acarbose

| Glucobay | This tablet slows the digestion of carbohydrate (starchy food). This reduces the rise of sugar in the blood after meals. Glucobay will not cause a low blood sugar level unless taken with a tablet from the sulphonurea group or insulin. | With meals. |

### 4. Meglitinides

| NovoNorm™ | This stimulates the pancreas to release more insulin. They are “short acting” tablets, which mean they start work soon after you take them but the effect only lasts for a short time. They may cause low blood sugar levels. | Before a meal. |

### 5. Thiazolidinediones

| Avandia Actos™ | This group help to lower blood glucose levels but increasing the effect of your own insulin, especially on muscle and fat cells i.e. they improve insulin resistance. They will not cause hypoglycaemia unless taken with a sulphonylurea. | Taken once or twice a day at any convenient time. |

**Special Note:**

If a low blood sugar occurs while taking Glucobay, it should be treated with glucose e.g. jelly beans, Lucozade. Ordinary sugar or fruit juice will take too long to work.
2.8. **Diabetes and other medications**

Diabetes can occur at any age and is a life-long condition. It is therefore only to be expected that people with diabetes will, at various times, have other medical disorders.

Medications may affect diabetes in different ways.

Make sure each doctor or pharmacist you consult knows that you have diabetes and is aware of all the medications you use.

Never take a new medication without determining if it may affect your diabetes and, if so, what precautions you should take.

Be aware that problems are most likely to occur at times of dose change or when you stop and start medications. At these times, take extra care.

2.9. **Sick Days – Feeling Unwell?**

When you are unwell, your body’s increased production of stress hormones will cause blood sugar levels to rise. Common causes of sick days include: colds, flu, sore throat, gastro, diarrhoea and urine infections.

During periods of illness, you need to take special care.

Keep by the phone a list of contact numbers for your doctor, diabetes nurse, hospital and ambulance. If possible, have a friend or relative come and check on you.

Seek medical advice if you are ill and not getting better.

2.9.1. **Sick Day Management - Type 1 diabetes**

- Continue to take your usual dose of insulin.
- Never omit or reduce your insulin dose when you are sick.
- More insulin is often needed rather than less at this time.
- Contact your doctor or diabetes nurse for advice about increasing your dose of short acting (clear) insulin.
- You may also need extra doses of this insulin e.g. 2-4 units every 2 hours.
- Eat according to how you feel and what food you can tolerate.
- If you cannot eat your usual meals, have small low fat snacks at regular intervals throughout the day. e.g. toast, crackers, boiled rice, soup, low fat custard or ice-cream.
- If you cannot eat food, have sips of fluid every few minutes.
High blood sugar levels, vomiting and diarrhoea can all lead to dehydration. If your blood sugar level is more than 15 mmol/l, have unsweetened fluids like water, clear soups, weak tea, or diet lemonade.

- If your blood sugar level is less than 15 mmol/l, have sweetened fluids like ordinary lemonade, cordial or apple juice.
- Test your blood sugar level more frequently e.g. every 2-4 hours and record all results.
- Test your urine for ketones every time you pass urine.
- If you have a meter that can test for blood ketones, test for blood ketones 1-2 hrly.
- Contact your doctor or go to hospital if:
  - your blood sugar level remains more than 15 mmol/l
  - moderate to large ketones are present in your urine or your blood ketone level is ≥ 1.5mmol/L
  - you cannot keep down any food or fluids
- In type 1 diabetes, high blood sugar levels or illness can lead to a serious condition called ketoacidosis. There will be moderate to large ketones in the urine.

You may also notice:
- breathlessness
- abdominal pain
- nausea and vomiting
- sweet fruity smell on the breath
- drowsiness

This is a medical emergency. If you have these signs, contact your doctor or go to a hospital emergency department immediately.

2.9.2. Sick Day Management - Type 2 diabetes

- If you take diabetes tablets or insulin, continue your usual dose.
- If you cannot eat your usual meal, try eating small frequent snacks.
- Suitable snacks include: toast, crackers, boiled rice, soup, banana, low fat custard or ice-cream.
- Drink plenty of fluids. High blood sugar levels, vomiting and diarrhea can all lead to dehydration.
- If your blood sugar level is less than 15 mmol/l, drink fluids such as ordinary lemonade, apple juice, cordial or sweetened tea or coffee.
- If your blood sugar level is more than 15 mmol/l, drink unsweetened drinks such as water, mineral water, diet lemonade, weak tea or clear soups.
- Test your blood sugar level more frequently e.g. every 2-4 hours and record all results.
- Contact your doctor, or go to a hospital emergency department if:
- your blood sugar level remains more than 15 mmol/l for more than 24hrs
- you cannot keep down any food or fluids
- you become drowsy

### 2.10. Getting Supplies National Diabetes Services Scheme (NDSS)

**What is the National Diabetes Services Scheme (NDSS)?**

The NDSS is a Commonwealth program that provides blood and urine testing strips and consumables for special injection systems at subsidised prices to people who register for its benefits. In addition to this, all state and territory governments have agreed to fund the co-payments for needles and syringes thus making them free for all NDSS registrants.

Diabetes Australia has administered the NDSS for the Commonwealth since 1987.

**Who can register for the NDSS?**

People who reside in Australia and have been diagnosed as having diabetes and hold or are eligible for an Australian Medicare card are entitled to register for Commonwealth Government subsidised products.

To qualify for NDSS benefits you must first complete a Registration Form, have it signed by your medical doctor and either mail it to Diabetes Australia GPO Box 9824 (insert your State/Territory capital city and its postcode) OR visit the Diabetes Australia office in your capital city.

The NDSS Registration form can be obtained from Diabetes Australia. Phone 1300 136 588 to contact your nearest office.

There is no cost to register for the NDSS.

**What are the benefits of the NDSS?**

Approved products – syringes, needles for special injection pens and blood and urine test strips – are available at subsidised prices generally below those of other sources of supply.
3. Diabetes and your body

3.1. The effects of diabetes

Although there are several long-term effects of diabetes, some effects can develop after only 6 or 12 months of high levels of glucose in the blood. Diabetes complications can cause major health problems such as blindness, heart disease, stroke and kidney failure.

High blood glucose levels

A high level of glucose in the blood is the most important factor causing long-term complications of diabetes.

Tobacco smoking

Tobacco smoking is the second single most important factor in the development of complications of the eyes, kidneys and blood vessels. It is extremely unusual of a person with diabetes to have a leg amputated due to blocked blood vessels unless they smoke.

High blood pressure

Untreated high blood pressure accelerates the blockage of arteries and increases the risk of heart attack, stroke, peripheral vascular disease and retinopathy.

Overweight and high blood fats

High blood fats and being overweight tend to accelerate the build up of fat in the lining of the blood vessels, accelerating the blockage of arteries.

Alcohol

Excess alcohol consumption aggravates nerve damage and causes high blood pressure, high blood fats and excess weight gain.

3.2. Diabetes and your Brain

Blood vessel blockage to the brain (cerebrovascular disease)

A blockage of an artery in or leading to the brain can lead to a stroke or cerebrovascular accident.
Symptoms

- loss of speech
- paralysis down one side of the body
- loss of vision
- coma or confusion.

Rehabilitation, including physiotherapy and speech therapy, often assists the person who has had a stroke to return to an active life.

A partial blockage of a blood vessel in or leading to the brain can cause symptoms such as temporary loss of speech, temporary paralysis, temporary impairment of vision, confusion or convulsions (transient ischaemic attack).

This situation needs urgent medical attention because anti-clotting treatment or surgery to clean out the arteries in the neck can prevent a subsequent stroke.

3.3. Diabetes and your Eyes

The most common diabetes related problem

Diabetes can damage the very small blood vessels on the back of the eye. The medical name for this damage is Diabetic Retinopathy. It can lead to loss of vision, even blindness.

Who is at risk?

If you have diabetes, you are at risk of vision loss from Diabetic Retinopathy. This is the case regardless of the type of diabetes you have, your age, or even the control you have over your blood-glucose levels. Its why everyone who has diabetes should have their eyes checked regularly – when diabetes is first diagnosed, and then at least every two years after that.

Looking after your eyes

There are three simple steps you need to take to look after your eyes and help prevent vision loss.

STEP 1: Have your eyes checked regularly to pick up early signs of damage so it can be treated before vision loss occurs.

STEP 2: Control your blood-glucose levels and make sure your diet is low in fat.

STEP 3: If your vision has been affected, seek treatment to stop it from getting worse.
Who can test your eyes?

Your doctor may conduct the test themselves, ask you to visit an optometrist, or refer you to a specialist.

The importance of early detection

If the damage is detected before it has affected your sight, treatment can prevent vision loss. Where vision loss has already occurred, treatment can only stop it from getting worse.

How Diabetic Retinopathy affects your vision

- At first you see normally
- Then you can experience blurred, distorted or patchy vision that can’t be corrected with prescription glasses
- You may have problems with balance, reading, watching television and recognizing people
- You can be overly sensitive to glare
- You may have difficulty seeing at night

For more information about preventing vision loss from Diabetic Retinopathy ask your doctor for: Diabetes and your eyes – A consumer guide for the management of Diabetic Retinopathy or call Diabetes Australia on 1300 136 588.

3.4. Diabetes and Smoking

Tobacco smoking is an important factor in the development of complications of the eyes, kidneys and blood vessels. It is extremely unusual for a person with diabetes to have a leg amputated due to blocked blood vessels unless they smoke.

While quitting may not be easy, it could be the best thing you can do to prevent the complications of diabetes.

Your blood sugar level

Research has found that smoking raises your blood sugar level, making it harder to control your diabetes. This is probably because nicotine and other products of smoking make it more difficult for insulin to work properly. It also raises high blood sugar levels.

Your heart

If you smoke and have diabetes, you are more likely to have a heart attack and three times more likely to die of cardiovascular disease. Uncontrolled blood glucose levels cause blood vessels to narrow. Smoking makes blood cells stick together and blood vessel walls more sticky, so that fat attaches to the vessel walls even faster. Fat deposits can block blood vessels, which leads to heart attack and stroke.
The nicotine in cigarettes increases your heart rate, and the carbon monoxide in cigarettes reduces oxygen in the blood. This means your heart has to work harder.

**Your circulation**

Smoking slows the circulation in the smaller blood vessels. People with diabetes are more likely to suffer from poor circulation in their feet and legs. Smoking can also aggravate foot ulcers, foot infections and blood vessel disease in the legs.

**Your eyes**

Diabetes can block the tiny blood vessels in the eyes, a condition called retinopathy. If you smoke, it is likely you will experience even more trouble with your sight.

**Your kidneys**

Smoking increases the risk of life-threatening kidney disease in those with diabetes. It may be due to a temporary increase in blood pressure and the effects of cigarette smoke on chemicals in the body that control kidney function.

**Your sex life**

If you are a man who smokes and has diabetes, you are more likely to experience problems having an erection. Smoking slows down blood flow and blocks blood vessels in the penis, and nerve damage may reduce sensation.

**Your joints**

If you smoke and have diabetes, you increase the likelihood of reducing movement and flexibility in your joints.

**Your nerves**

If you have diabetes, smoking will increase the risk of nerve damage in all parts of your body, a condition which leads to numbness and sometimes pain. It may be that smoking damages the blood vessels that carry oxygen and nutrients to the nerves.

**Your teeth**

If you smoke and have diabetes, you will have a greater chance of developing gum disease and losing your teeth.
3.5. Diabetes and your Heart

**Blood vessel blockage in the heart (ischaemic heart disease)** is caused by progressive narrowing of the coronary arteries which nourish the heart muscle.

The symptoms are intermitted chest pain, generally brought on by exertion and relieved after a few minutes rest. This is due to a partial blockage of a heart or coronary artery and is called angina.

Unfortunately people with diabetes are often unaware that they have narrowed blood vessels in the heart until they block completely, causing a heart attack.

The usual symptom of a heart attack is a heavy, pressing pain across the front of the chest, sometimes going into the neck or down the left arm. Unlike the intermittent pains of angina, the pain of a heart attack may last several hours and is not relieved by rest.

Other symptoms include sweating, breathlessness, nausea, vomiting and loss of consciousness.

In people with diabetes who have nerve damage, chest pain associated with a heart attack can be absent.

Summon medical help immediately if chest pain does not disappear completely within three to five minutes. This is a medical emergency.

Provided the amount of heart muscle affected is not large, healing usually takes place and the person can return to normal activity.

Blocked or diseased heart arteries are often surgically bypassed or sometimes opened up with a balloon and kept open by insertion of round mesh of metal called a stent.

3.6. Diabetes and Pregnancy

Pregnancy in women with diabetes (Gestational Diabetes) usually results in a normal delivery with no effects on the mother’s long-term health.

Pregnancy in women with diabetes
Among women with diabetes who become pregnant, the majority will have type 1 diabetes, although some aged 30 plus will have type 2 diabetes.

Any pregnant woman with known diabetes requires specialist care and advice.
Pre-pregnancy care

Women with type 1 diabetes have a slightly increased risk of having a baby with a birth defect. Excellent control at the time of conception and during the first eight weeks of pregnancy minimises this risk.

It is therefore extremely important to plan the pregnancy and achieve the best possible blood glucose control before becoming pregnant.

Women with type 2 diabetes who are planning a pregnancy ideally should cease taking tablets and achieve excellent diabetes control on insulin before conception.

Careful attention to nutrition is essential, not only for good diabetes control, but to meet the body’s increased nutritional requirements during pregnancy.

Exercise is also helpful in maintaining general fitness and good blood glucose control.

Breast-feeding

There is no reason why women with diabetes should not breast-feed. Insulin requirements are generally slightly lower in the breast-feeding mother so take particular care to avoid hypoglycaemia. Insulin does not pass into the breast milk and is not harmful to the baby.

However, oral hypoglycaemic tablets are passed into breast milk, and women on tablets before pregnancy should continue on insulin treatment while breast-feeding.

3.7. Diabetes and your Kidneys

Diabetic kidney damage is usually due to changes in small blood vessels leading to the filtering system of the kidney or to the smaller blood vessels within the filtering system itself. It is a completely painless process and cannot be detected, even by a physical examination by a doctor.

Detection of early kidney damage, however, is possible by testing the rate at which the kidneys are leaking a protein called albumin into the urine. The urine is tested with a special test strip in the laboratory.

If kidney damage is detected, high blood pressure medications called ACE inhibitors help protect the kidneys from further diabetic kidney damage.

Infection of the bladder and kidneys

- People with diabetes have a higher chance of developing infections of the vagina, bladder and kidneys than people without diabetes.
Bladder and kidney infections are more common in women because of the short length of the urethra, the tube taking urine from the bladder to the outside of the body.

Germs can be massaged backwards up this tube in women during sexual intercourse and it is wise to empty the bladder after sexual intercourse to flush out any germs before they multiply.

The urine and vaginal secretions or people with diabetes often contain increased amounts of glucose, particularly if the level of the glucose in the blood has been high. This provides an excellent source of food on which germs (bacteria and fungi) can grow.

If the nerves to the bladder have been damaged by diabetes, the bladder may not empty completely when passing urine, leaving some urine inside the bladder where germs may multiply.

Symptoms of bladder and kidney infections are:
- passing of small amounts of urine at more frequent intervals, day and night
- a burning discomfort or pain when passing urine
- backache is also an occasional symptom of kidney infection

Infections of the bladder and the kidney usually occur together. Antibiotics taken by mouth usually treat infections effectively.

Prompt treatment of bladder and kidney infections is important as these infections, if allowed to continue, may result in chronic kidney damage.

### 3.8. Diabetes and Sexual Health

#### Sexual Problems in men

- Men with diabetes are more likely to experience some kinds of sexual problems than men without diabetes.
- The most common sexual problem is erectile dysfunction, but premature ejaculation, failure to ejaculate and an inability to sustain an erection may also be problems.
- Erectile dysfunction may occur in men with signs of other complications from diabetes.
- Men with diabetes may suffer from a temporary loss of sexual desire if blood glucose levels are high. This often improves once blood glucose control improves.
- Ideally, treatment options will be discussed with both partners. The particular cause of the sexual problem determines the treatment. Modern treatment is effective, relatively inexpensive and safe.

#### Diabetes and women’s health

- There is no evidence to suggest that women with diabetes encounter more sexual difficulties than other women.
- Women with diabetes often report a cyclical change in their insulin requirements related to the menstrual cycle.
- High blood glucose levels can have a temporarily adverse effect on the sexual aspects of a woman’s life.
- Diabetes increases the risk of thrush.
Simple and effective treatments exist for most problems encountered.

3.9. Diabetes and your Feet

Foot problems are associated with persistently high blood glucose levels. Therefore, it is important to keep blood glucose levels consistently within the normal range as this alone helps prevent many of the complications of diabetes, including foot problems.

Four Foot maintenance areas:

1. Nerve damage
2. Blood vessel damage
3. Foot shape
4. Self-care

1. Nerve damage

Nerve damage in the legs causes:
- numbness
- coldness of the legs
- a tingling, pins and needles sensation in the feet
- burning pains in the legs and feet, usually more noticeable in bed at night.

This can lead to a loss of sensation in the feet, causing accidental damage because the person cannot feel any pain.

This can develop into ulcers on the bottom of the feet that can penetrate to the bone, leading to osteomyelitis and chronic infection in bones and joints.

This may necessitate amputation if not treated vigorously from the earliest time of infection, ulceration or the slightest discharge in the feet or toes.

Always seek urgent medical advice for even the mildest looking foot infection.

Numbness or tingling plus a pins and needles sensation in the hand is more often due to compression of a nerve as it runs through a bony tunnel in the wrist, a condition relieved by a simple operation. This problem is relatively common in people with diabetes.

Nerve damage is detected by testing for different types of sensation in the feet and legs and by testing the knee and ankle reflexes.

Examine your feet at least every second or third day.

If you have nerve damage in the feet, do not walk barefooted and do wear properly-fitted shoes that rub neither feet nor toes.
2. Blood vessel damage

Also known as clogging or narrowing of the arteries, this condition means that less blood is able to flow through the blood vessels.

If the feet lack a healthy supply, they are more prone to infection following any injury that breaks the skin. Avoid dryness and dry skin cracks with regular use of a moisturizing cream.

Signs of poor blood supply:
- sharp leg cramps after walking short distances or up stairs
- pain in the feet, even at rest (often in the early hours of the morning)
- feet feeling cold
- feet looking a reddish-blue colour
- cuts which are slow to heal

See your podiatrist, doctor or diabetes educator if you have any of these symptoms.

3. Footshape

Some people’s feet do not work properly and become an odd shape; others inherit an unusual foot shape. People with diabetes with misshapen feet and nerve damage are the most likely to:

- develop ulcers from too much pressure over some areas of the feet
- develop more corns and calluses due to too much pressure on one area and can be avoided with some changes.

Seek your podiatrist’s help to get rid of calluses or corns before they become ulcers as these can become infected, risking the leg.

4. Self-care

Do the following daily:
- wash your feet well and dry gently
- moisturise with a suitable cream
- check for trouble spots such as redness, swelling, cuts, pus discharge, splinters or blisters, being especially careful to look between toes, around heels and nail edges and at the soles of the feet – if you have difficulty with your vision you will need someone to check for you
- cover your feet with a clean sock or stocking without rough seams
- protect your feet in a shoe which fits well and has been checked for stones, pins, buttons or anything else which could cause damage
- It is risky for anyone with poor blood circulation or limited sensation to cut their own nails. Thick or ingrown nails need special podiatry care.
- Nails need to be cut straight across, not too short and never down the sides. File rough edges with an emery board.
If you find an injury:
- wash and dry the area
- apply good antiseptic
- cover with a sterile dressing
- if it does not improve within 24 hours, seek help to avoid complications.
4. Food and Nutrition

4.1. Healthy Eating

For a person with diabetes to remain healthy, one of the most important things is to keep the blood glucose level as near to normal as possible.

This can be achieved by following a healthy eating plan, undertaking regular physical activity / exercise and taking insulin and/or tablets if required.

Many overweight people who develop diabetes in middle age may be able to improve control of their blood glucose level by reducing their weight.

From time to time you may need alterations to your eating plan, therefore it is important to have regular reviews with your doctor, dietitian and diabetes educator.

The basis of traditional food habits for different cultures is suitable for people with diabetes as they are based on plenty of whole grains, vegetables, fruit and nuts, sea food and only small amounts of meat and meat products.

It is low in saturated fat, moderate in protein, and high in carbohydrate. It does not need to be sugar free, but concentrated sources like soft drinks, cordials, lollies and other sweets should be limited. The use of processed and convenience food is limited and so maintaining traditional food habits can help manage diabetes.

When people migrate to Australia, they are faced with many new foods and Western food habits. Many people adopt a combination of traditional and Western food habits.

This often means an increase in meat and meat products, processed and convenience foods and high fat/sugar snack foods. These changes in food habits can lead to health problems.

For people with diabetes, it is best to combine the best food choices from both traditional and Western food habits to help manage their diabetes.

A good eating pattern for a person with diabetes will:
- Contain mostly high fibre carbohydrate foods – wholegrain cereals and bread, vegetables and fruit
- Be low in saturated fat
- Provide adequate protein for good health

Diabetes and your diet
Healthy eating helps control blood glucose levels
Choose

- Mainly carbohydrates (for example, wholegrain breads, pasta, rice (eg Basmati or Doongara), legumes, vegetables and fruit)
- Be moderate in protein intake (for example, lean meat, skinless chicken, fish and eggs)
- Select foods high in fibre (for example, wholegrain bread, fruit and vegetables)

Avoid

- Saturated fats (for example, meat fat, butter, cream, cheese, cooking margarine, palm oil, copha, coconut milk/cream, processed snacks and take-away foods)
- Foods very high in sugar (for example, soft drinks, cordials, sweets, lollies, and other sweets)
- Learn which foods contain carbohydrates, proteins and fats.

Know the energy values of foods so that wherever you are you can make wise meal choices.

Ask your dietitian to help you review your nutrition needs and to explain aids such as the glycaemic index (fast and slow release) and carbohydrate exchange systems which may assist in your diabetes control.

Limit your fat and oil intake.

Learn to differentiate between good fats (poly and mono-unsaturated) and bad fats (saturated).

Learn to correctly interpret the nutrition information panels on food products.
5. Diabetes and Exercise

5.1. Diabetes and Exercise

Everybody benefits from regular exercise. In diabetes it plays an important role in keeping you healthy.

How can exercise help

- It helps insulin to work better which will improve your diabetes control
- It can help you control your weight
- It can help lower your blood pressure
- It can reduce your risk of heart disease
- It can help reduce stress

What type of exercise should I do?

This depends on what you enjoy and your level of fitness. Here are some suggestions:

- Walking
- Swimming
- Dancing
- Water aerobics
- Gardening
- Golf
- Cycling
- Exercise bike
- Walking machine

Increasing your general physical activity is also helpful. e.g. taking the stairs instead of the lift, getting up to change the TV station instead of using the remote control, housework.

How much exercise do I need to do?

Ideally, about 30 minutes every day. If this is not possible, then this time can be divided in 3x10 minutes sessions.

How intense does the exercise need to be?

You do not need to puff to gain the benefits of exercise. Aim for moderate intensity. This
means you should still be able to talk as you exercise without becoming breathless.

**Getting started**

Before commencing a regular exercise program, see your doctor for a full medical examination. This is especially important if you have any complication of diabetes. Commence exercising gradually. Start with 5-10 minutes and slowly build up to 30 minutes.

**5.2. Exercise Tips**

- **Drink extra fluid** before, during (only if prolonged exercise) and after exercise to avoid dehydration.

  The fluid may be water, or a sweetened drink if extra carbohydrate is required. 250 ml every 15 minutes or one litre of fluid per hour is recommended.

- **Take care of your feet**

  Wear comfortable and well-fitting shoes.

  Always inspect your feet before and after exercise.

  Ulcers or other lesions on the feet are a serious danger for people with diabetes. It is important to avoid foot damage especially for middle-aged and elderly people. It is wise for them to avoid exercise that causes stress to the feet (e.g. running).

  Exercise which poses minimal weight or stress on the feet is ideal such as riding an exercise bike or brisk walking in good footwear.

- **Take extra carbohydrate** before and during exercise to prevent hypoglycaemia.

  Extra carbohydrate is often needed after exercise.

  Monitor your blood glucose levels before, if possible during (at least initially), and after exercise to assess your requirements for extra food.

  Discuss adjusting carbohydrate intake with your dietitian.

- **Adjust insulin and medication.**
It may be necessary to reduce your insulin dose prior to exercise. Insulin adjustment varies with each individual. Discuss appropriate adjustments to suit your exercise schedule with your doctor or diabetes educator.

- Wear sun block when exercising outdoors

**Advice for people with type 1 diabetes**

- If your diabetes is poorly controlled (i.e. fasting blood glucose levels greater than 14 mmol/L and urinary ketones) then it is best to avoid exercise until your blood glucose has settled.

- Exercise in these circumstances can actually elevate a high blood glucose and increase ketone production.

**Advice for people with type 2 diabetes**

- Regular exercise is an important part of your management.

- It will help your insulin to work more efficiently and assist with your blood glucose control.