



DIABETES

PREVENTION AND MANAGEMENT

IN

PACIFIC ISLANDS COUNTRIES AND TERRITORIES



Produced by the Public Health Division of SPC - Illustrations by Yannick Le-Bars.
Printed by Star Printery, Suva, Fiji 2021
Funded by SPC

CHANGE OF LIFESTYLE IN THE PACIFIC

PART I

Pacific Island countries and territories are in a state of transition. Pacific Island people are changing fast from a lifestyle which is healthy– with farming, fishing, walking and gardening– to a less healthy lifestyle where food and goods are purchased and not produced locally, people use cars, and generally there is less physical exercise. The increased migration from rural areas to towns and cities has also meant a big change to the Pacific way of life.

Ask participants to describe some of the changes in their lifestyles.

Increased availability of cash and exposure to imported foods have resulted in malnutrition and increased consumption, with diets high in sugar and fats and often low in fibre, vitamins and minerals.

A reduction in physical activity, fishing, walking and gardening has led to an increase in obesity in both adults and children.

A high rate of smoking and increased consumption of alcohol are making the situation worse.

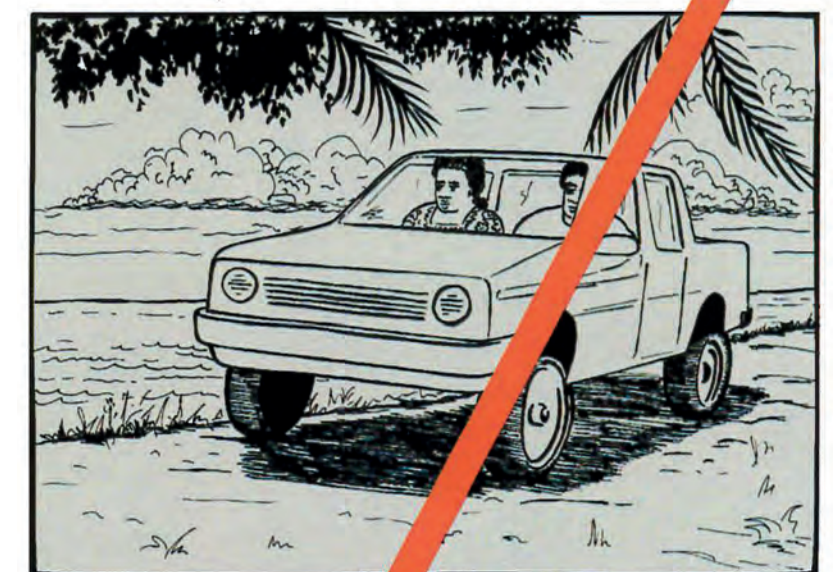
Diabetes has reached epidemic proportions in the Pacific islands. This means that people in the Pacific can suffer from complications from diabetes such as blindness, amputations and kidney failure.

One solution is to keep to the traditional ways of living, eating and exercising/being active.

Refer to the pictures as good examples of a healthy lifestyle:

- *Gardening*
- *Fishing*
- *Paddling*
- *Walking*

CHANGE OF LIFESTYLE



THE BODY

Diabetes is a disease which affects many body parts, so we need to understand how our body works and how it uses food for energy.

Mouth: important for chewing food before it goes down the long tube (oesophagus) and into our stomach.

Salivary glands: produce saliva which is important for breaking down the food.

Oesophagus: long tube which helps to carry the chewed food to our stomach.

Heart: like a pump that distributes blood throughout our body, via arteries and veins.

Liver: a dark organ, it helps filter the blood. The bile also helps us digest food.

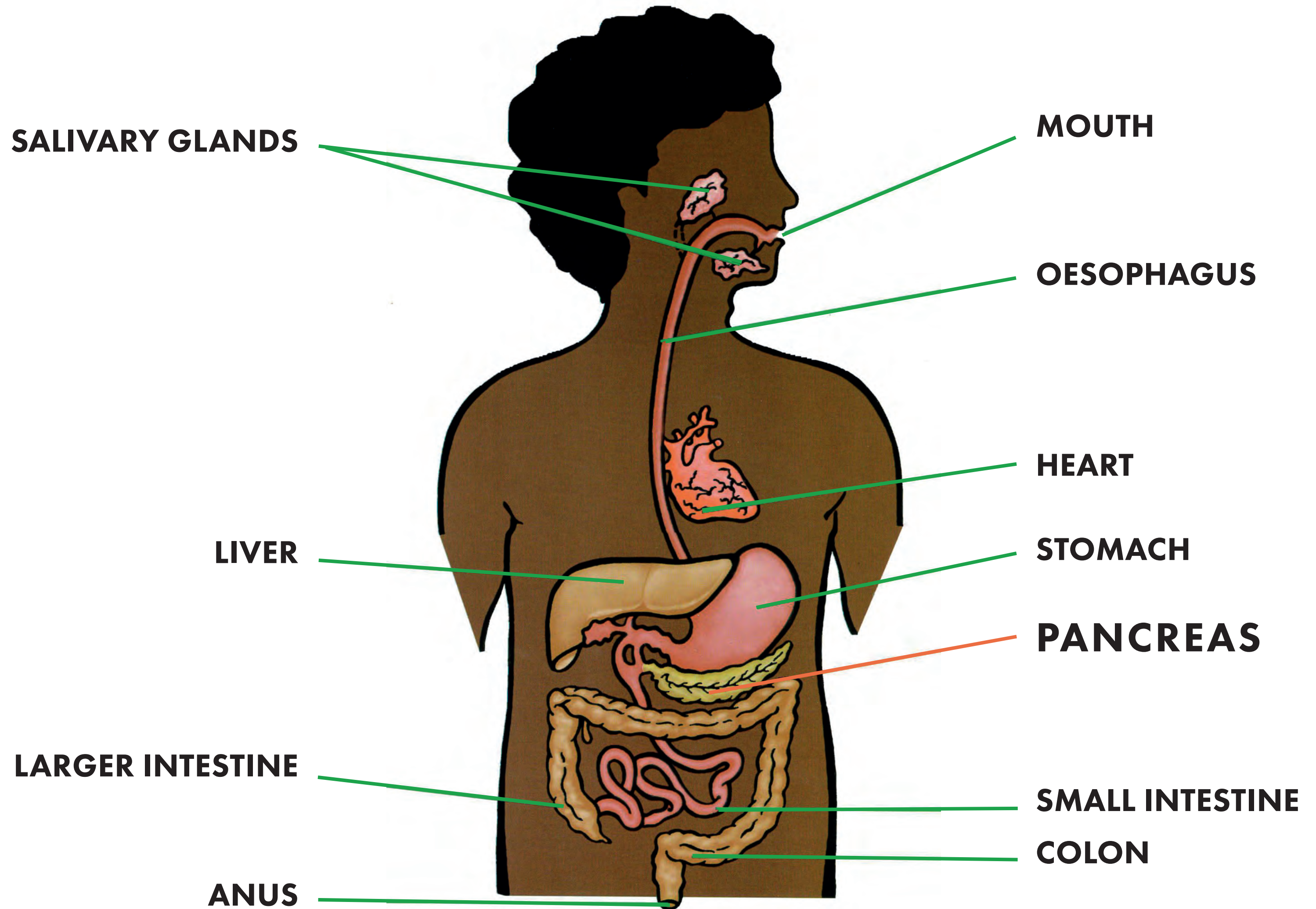
Stomach: food goes down the oesophagus (tube) and into the stomach. Some of our food is broken down in the stomach.

Pancreas: makes digestive juices to help break down food; it also produces insulin which helps sugars from all foods get into our body cells to give energy.

Intestines: the food gets broken down in the stomach and intestines. Important nutrients are absorbed into the blood; the remainder is excreted.

Blood: transports nutrients, including sugar, to all cells in the body.

THE BODY



THE BODY

Cells in the body are building blocks. There are millions in our bodies and you must look under a microscope to see them.

All cells in our bodies need nutrients for energy.

Refer to picture

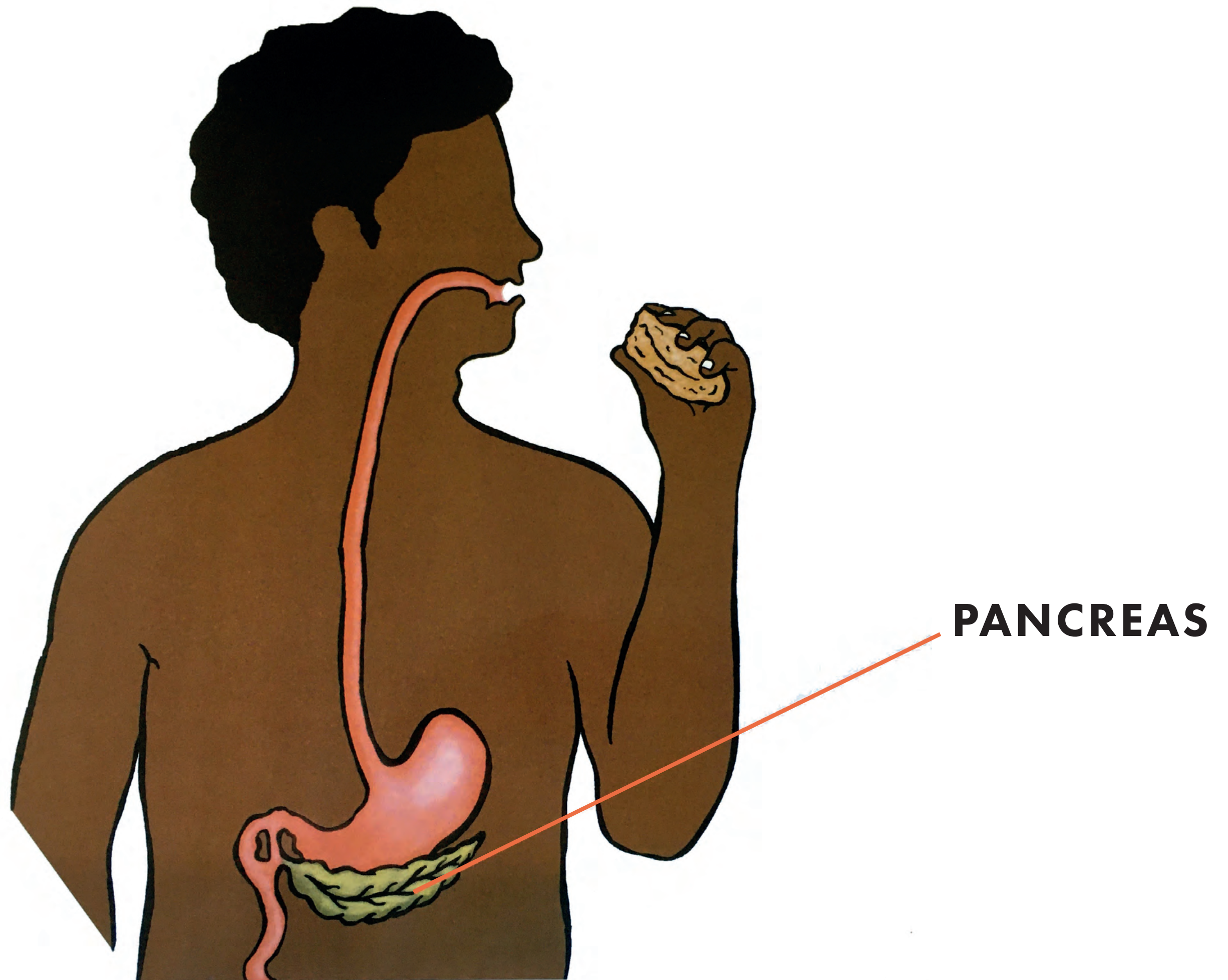
The food that we eat travels into the stomach where it is broken down or digested. Digestion means breaking down the food to release the nutrients into the bloodstream. Sugar (or glucose) from foods is an important nutrient as it is rapidly changed into energy or fuel when we need it quickly, such as during work, dancing or sport.

The food is broken down by digestive juices.

The pancreas is one of the organs that makes digestive juices to help break down the food.

The nutrients are now small enough to pass into the blood. The heart pumps the blood through all parts of the body to transport the nutrients to our cells for energy, growth and repair.

THE BODY



THE BODY AND DIABETES

Sugar or glucose is a nutrient which cells need for energy. To assist glucose enter the cells, the pancreas releases the hormone INSULIN into the blood. Insulin is like a key: it unlocks the cells to allow sugar to enter. It controls the level of sugar in the blood.

Only a small part of the pancreas is responsible for making insulin – most is responsible for making digestive juices.

The INSULIN travels to the cells and the insulin acts like a key; it opens the gates of cells to allow sugar to get in.

Inside the cells, sugar is turned into energy or fuel.

If there is more sugar than the body requires in the blood, the excess will be taken up by the fat cells and converted to fat. Fat is an energy reserve.

When insulin has done its work, it is broken down. This is why new supplies of insulin are needed all the time. Most insulin is needed just after a meal. Less insulin is needed at other times.

Summary:

- Sugar is taken out from food;**
- Your blood sugar level rises; and**
- Insulin is produced by your pancreas and released into the bloodstream to allow the sugar to go into the cells as a source of energy.**

Sugar is an important fuel for the body; it gives us energy to work and function.

Fat is also a source of energy or fuel that our body uses.

As adults we all have a set amount of fat cells. Fat cells can expand and shrink. If we are overweight our fat cells have expanded storing unused energy.

THE BODY AND DIABETES

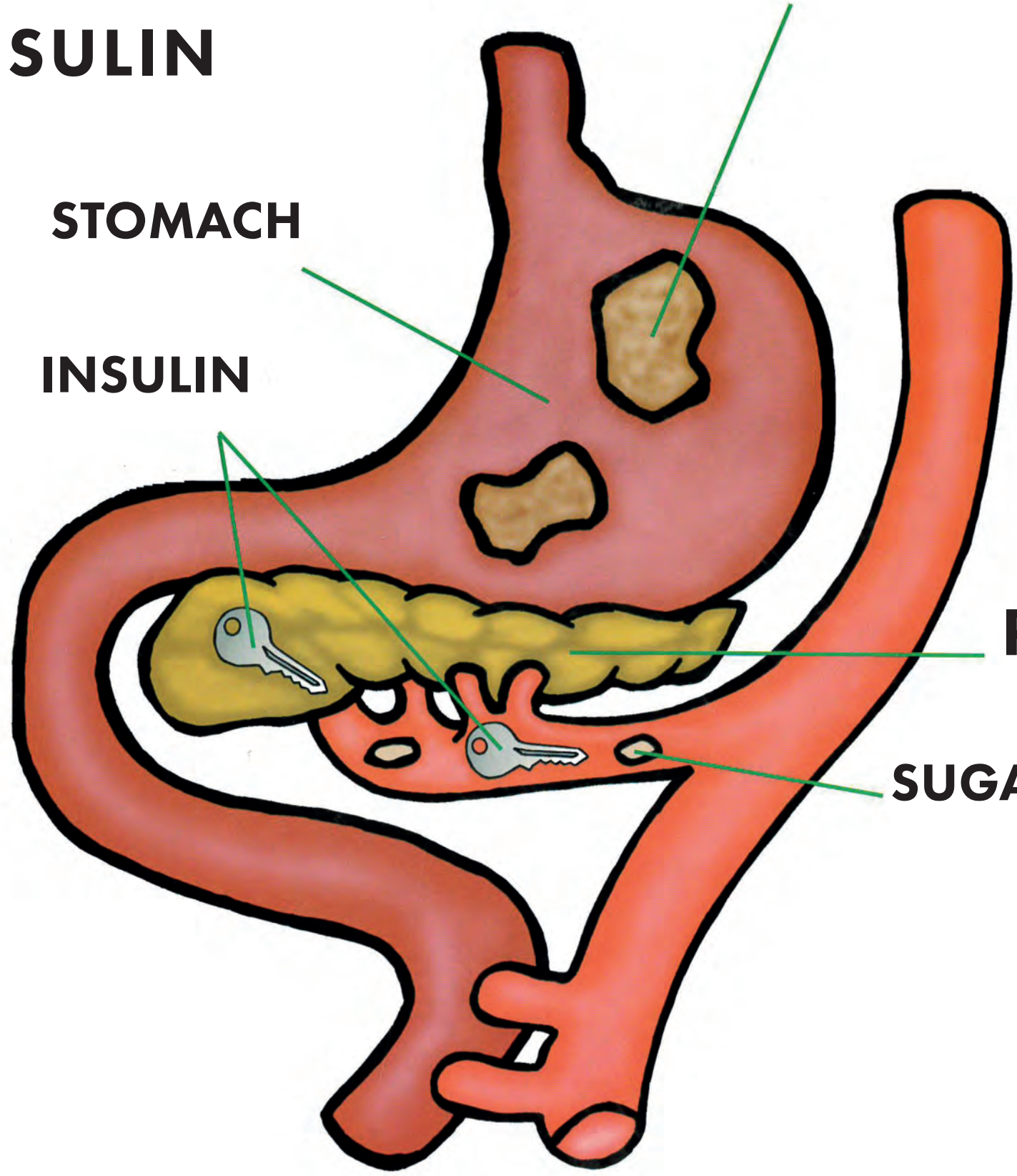


INSULIN

FOOD

STOMACH

INSULIN



PANCREAS

SUGAR

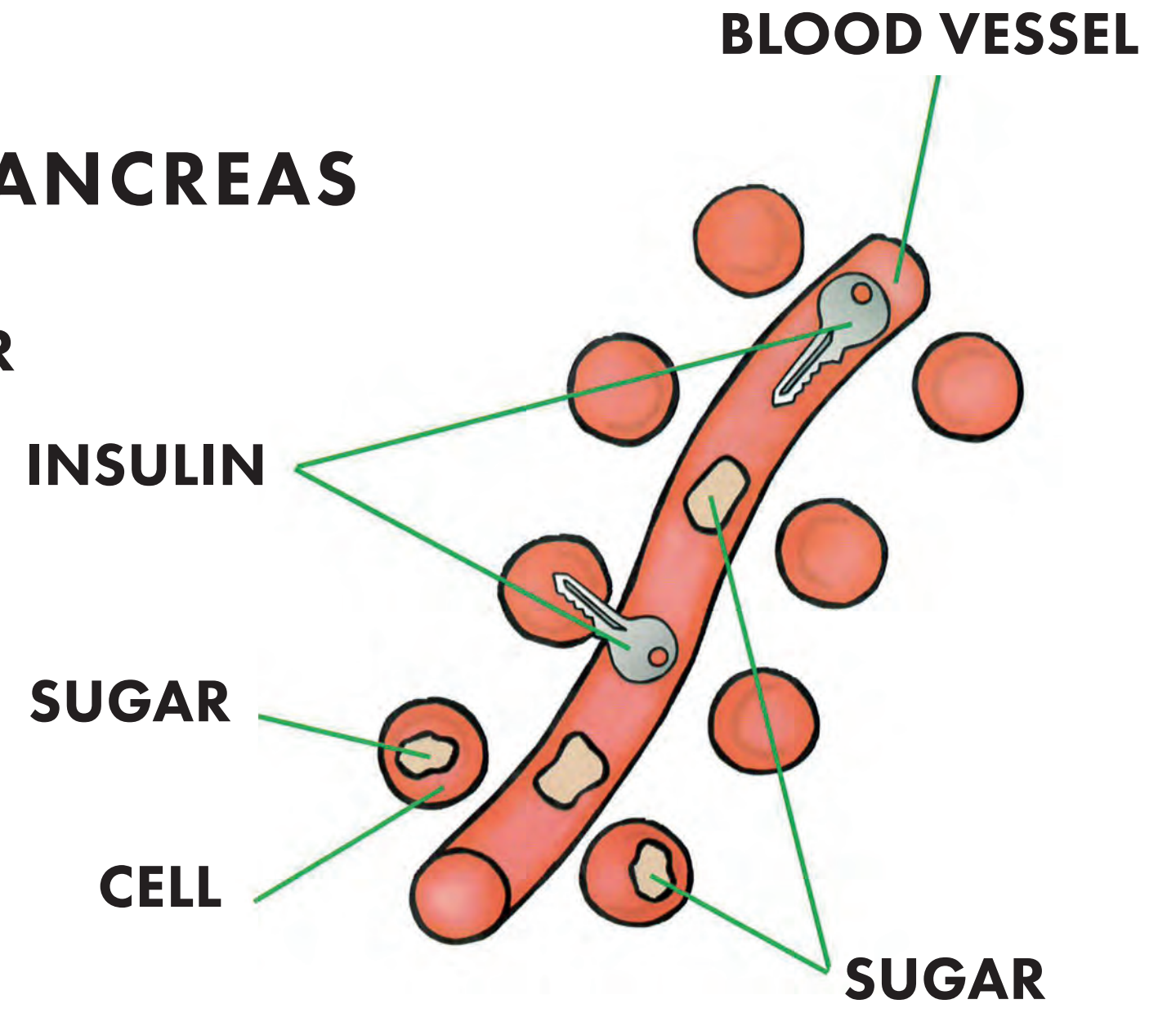
BLOOD VESSEL

INSULIN

SUGAR

CELL

SUGAR



THE BODY AND DIABETES

We have seen how the healthy body uses sugar in the blood for energy, with the help of the pancreas, which releases insulin to allow sugar to enter the cells.

Now we are going to look at the body with diabetes.

We start as before:

- the food that we eat travels into our stomach where it is broken down; the food is broken down by digestive juices and absorbed through the small intestine;
- the pancreas makes digestive juices;
- the food is broken down into sugar (or glucose). The sugar goes into our blood to be transported to our cells for energy.

So, the blood sugar level has risen.

For a body with diabetes there is a problem:

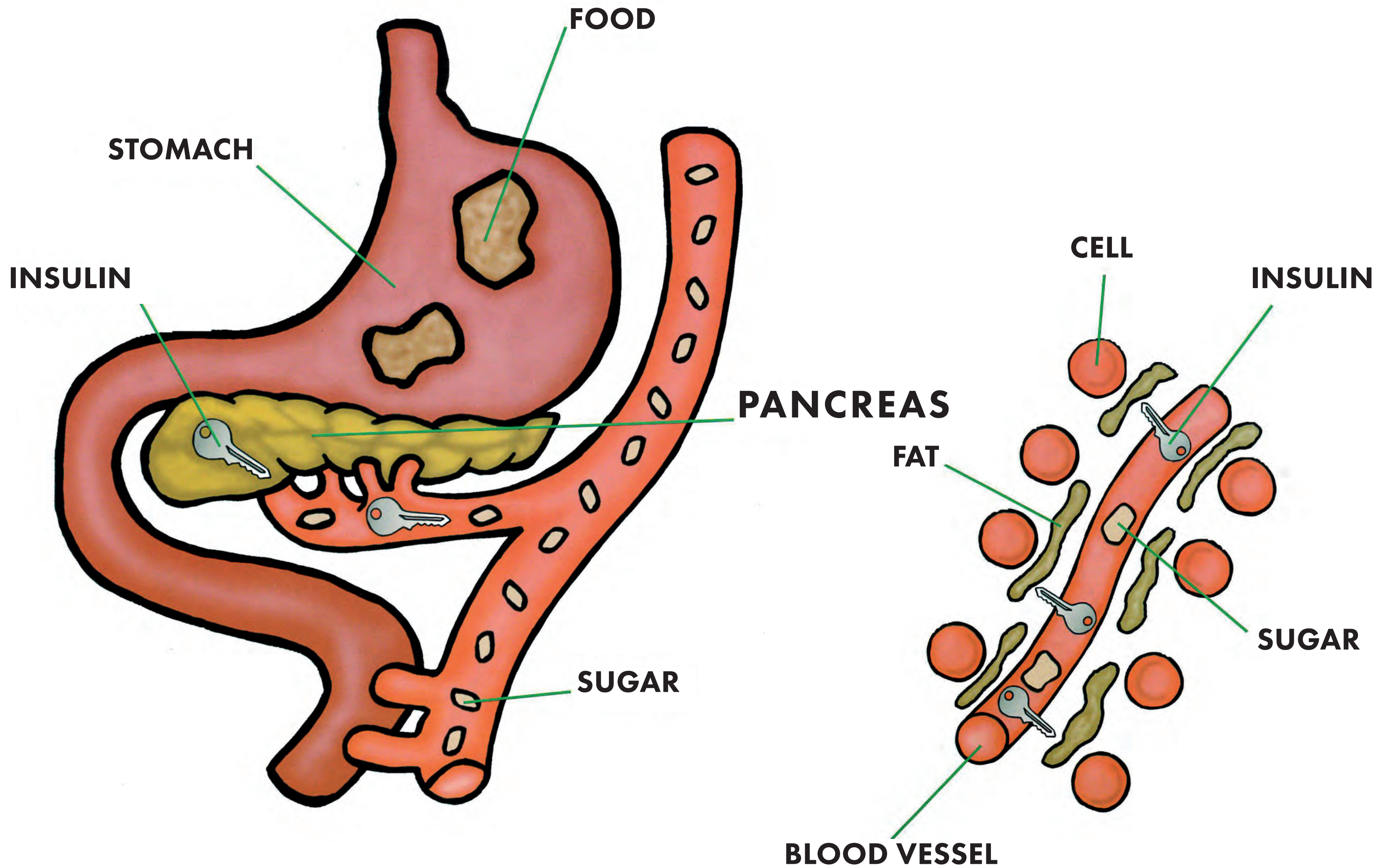
1. The pancreas in a person without diabetes usually reacts quickly by releasing insulin, but the pancreas is a bit blind or slow in a person with diabetes. So insulin is not released quickly enough and the sugar levels in the bloodstream rise.
2. Sometimes the pancreas does eventually work, realising that the blood sugar level is rising, and releases insulin. The insulin moves towards the cells but has difficulty getting to the lock of the cells to allow the sugar to go inside the cells. This usually happens if the person is overweight, as the fat interferes with the gates of the cells.

The sugar builds up in the bloodstream. The blood sugar level rises and sugar spills through the kidney and is passed in the urine.

Excess sugar is stored as fat. This leads to being overweight in some people.

Diabetes develops when the body cannot use the sugar properly, and there is too much sugar in the blood. Too much sugar in the blood is bad. It damages artery walls and organs.

THE BODY AND DIABETES



RISK FACTORS FOR DIABETES

Group discussion: *What do you think brought on your diabetes?*

Modifiable risk factors:

- being overweight and/or obese
- change in diet, from traditional root crops, fish, fruits and vegetables to processed foods that are high in sugar, salt and fats
- lack of physical activity and exercise
- having pregnancy- induced diabetes (GDM– gestational diabetes mellitus) in previous pregnancies

Unmodifiable risk factors:

- age – your risk increases as you get older
- hereditary factors
- worry and stress

RISK FACTORS



LACK OF EXERCISE



OVERWEIGHT



HEREDITARY FACTORS



OVER-EATING



PREGNANCY-INDUCED DIABETES



WORRY AND STRESS

SIGNS AND SYMPTOMS OF DIABETES

Refer to pictures

FATIGUE/FEELING TIRED:

The cells are starved of sugar or energy and so you feel tired.

POOR EYESIGHT/BLURRED VISION:

Blood sugar build-up temporarily causes vision or eye problems.

PASSING URINE FREQUENTLY:

More water from the body is required in order for the excess blood-sugar to be excreted. This results in passing urine more frequently.

FEELING THIRSTY ALL THE TIME:

Passing urine more frequently means that there is a loss of body water. This needs to be replaced; feeling thirsty all the time will ensure that the water is replaced by drinking.

PAINFUL LEGS, SLOW- HEALING SORES, FOOT PROBLEMS:

Blood sugar build-up clogs the blood vessels of the legs and feet causing poor circulation, numbness, tingling, weakness and slow -healing sores.

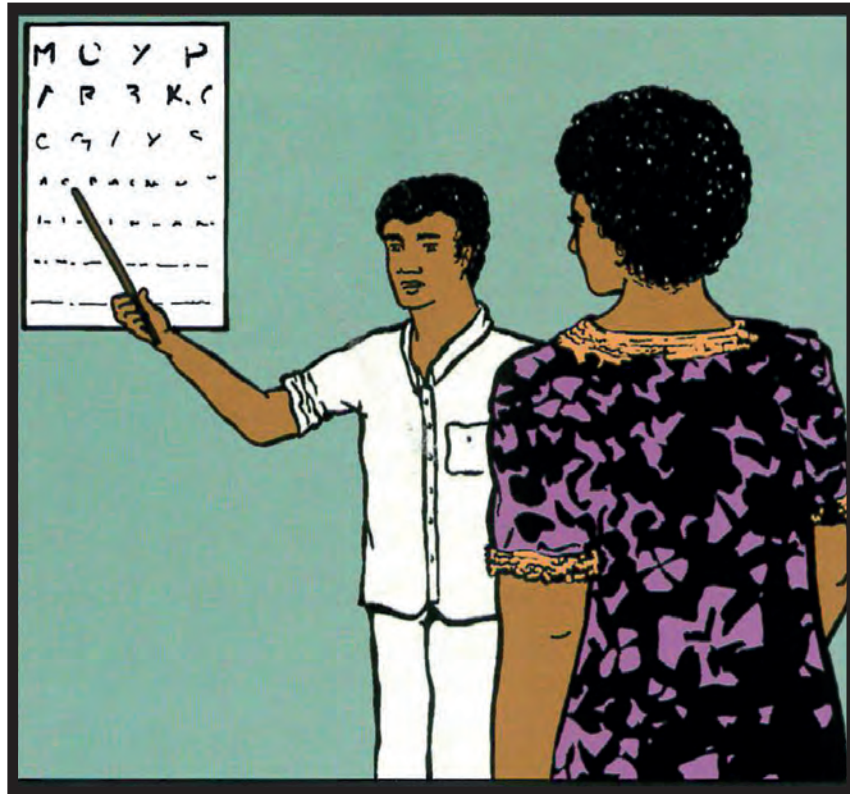
SIGNIFICANT WEIGHT LOSS:

See your doctor or health worker if you have any of these signs and/or symptoms.

Many other problems can have these signs/symptoms, so it is very important to see your doctor, health clinic nurse or health worker.

Sometimes you have no signs or symptoms and you feel okay but your sugar level may be still high. Having high sugar levels for a long time can damage your body, even if you feel okay.

SYMPTOMS



**POOR EYESIGHT/
BLURRED VISION**



FATIGUE/TIREDNESS



**PASSING URINE
FREQUENTLY**



**PAINFUL LEGS – PINS AND
NEEDLES/SLOW-HEALING
SORES/FOOT PROBLEMS**



**FEELING THIRSTY ALL
THE TIME**



SIGNIFICANT WEIGHT LOSS

DIABETES IS SERIOUS

High levels of sugar in the blood over long periods of time can slowly damage blood vessels, nerves and many important parts of the body. Blood circulates in the arteries, the capillaries and the veins. The arteries are very large vessels carrying blood from the heart to all parts of the body. The blood continues via fragile vessels called capillaries which allow nutrients in the blood to pass to the cells. The blood returns to the heart through the veins. One of the problems with diabetes is that it can cause narrowing of the arteries, so they become clogged.

Brain: Narrowing or blockage of the vessels in the brain can lead to a **STROKE**.

Eye: Damage to the small blood vessels at the back of the eyes causes poor vision or **BLINDNESS**.

Heart: **HEART ATTACK** occurs when the arteries supplying the heart and muscle with blood become clogged and harden. If you are overweight the heart has to work harder to pump the blood around the body.

Kidney: Damage to the small blood vessels of the kidneys from high sugar levels can lead to progressive kidney failure and **KIDNEY DISEASE**. People with diabetes are prone to bladder and kidney infections. These can cause you to urinate frequently and to experience pain or a burning sensation when passing urine.

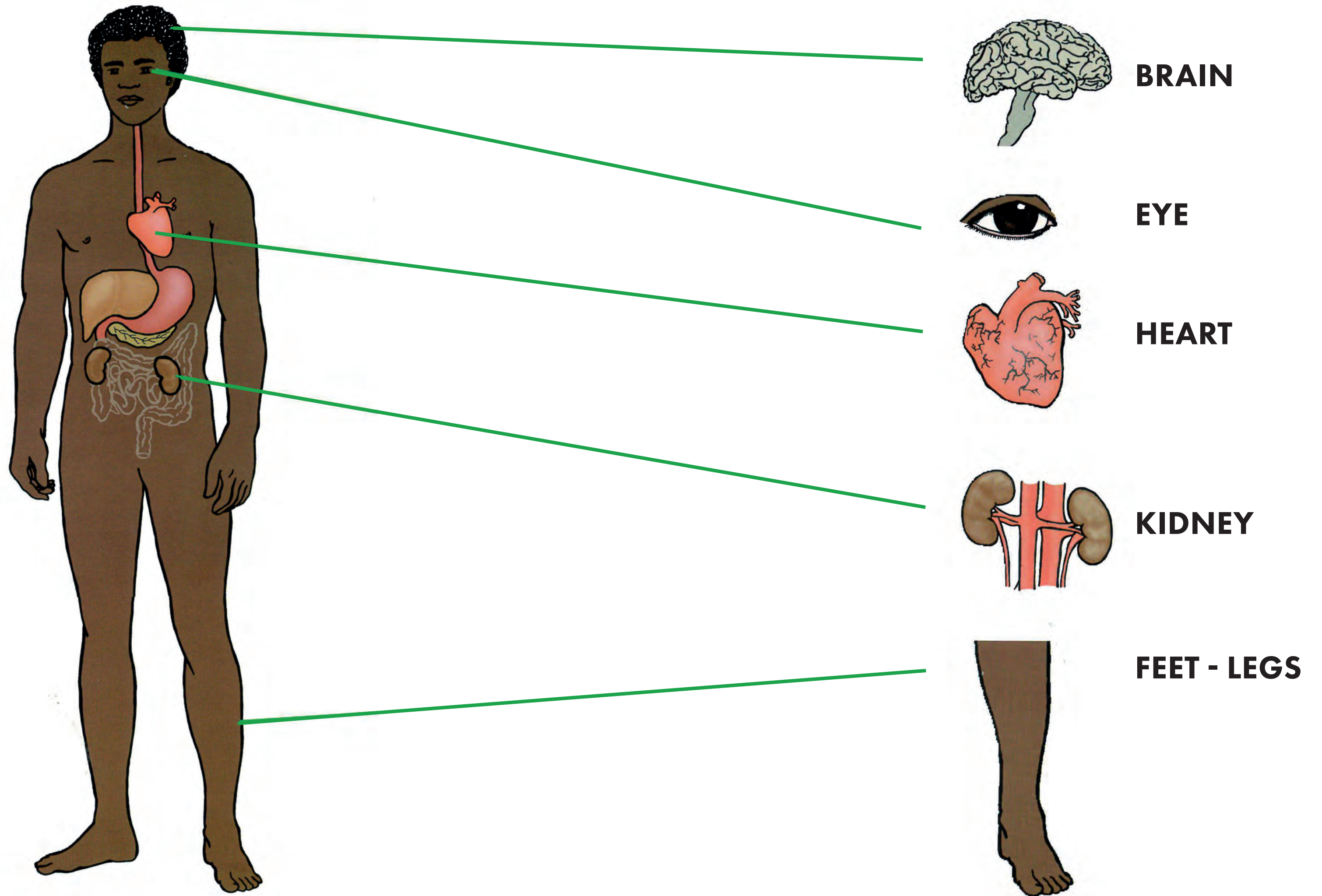
Legs and feet: Nerves in the legs and feet take information about the legs and feet to the brain – information such as whether it is hot or cold and whether there is pain, damage or sores. Excess sugar binds on to the nerve and damages it. This damage means that the messages about your leg or foot are not getting through to your brain. Sensation is numbed, preventing you from feeling pain. Because of this it is easy to overlook injuries and infections, and this may lead to amputations. Narrowing of the arteries and damage to the nerves can lead to severe pain and loss of muscle power.

Penis: Men with diabetes may have problems with erection due to damage to the nerves, and arteries narrowing, and the internal structure of the penis.

High blood pressure/hypertension:

High blood pressure can lead to further damage to your heart, kidney, eyes and general circulation. Stress can lead to high blood pressure. High blood pressure is one of the most common health problems in the Pacific Islands. Ask your doctor or nurse to measure your blood pressure regularly and ask about ways of managing your stress.

DIABETES CAN DAMAGE THE BODY



PREVENTION OF DIABETES

1. HEALTHY EATING FOR THE WHOLE FAMILY

If you are overweight or concerned about your family's health:

- eat regular meals everyday
- avoid eating food and drinks with sugar
- choose and prepare foods with less salt and fats
- eat plenty of vegetables and fruits everyday
- control amount of food consumed at each meal
- drink plenty of safe and clean water everyday.

2. EXERCISE

- Dancing
- Walking
- Swimming
- Cycling
- Physical activity as a family or individually, e.g., walking, swimming, cycling, dancing, etc
- Regular physical activity of at least 30 mins for 4–5 days a week.

3. MANAGE YOUR STRESS

- talk about and share your problems with people who can help you
- exercise; vigorous exercise reduces stress

4. REGULAR MEDICAL CHECK-UP

- have your blood-sugar checked by your doctor or health worker
- have your bloodpressure checked by your doctor or health worker

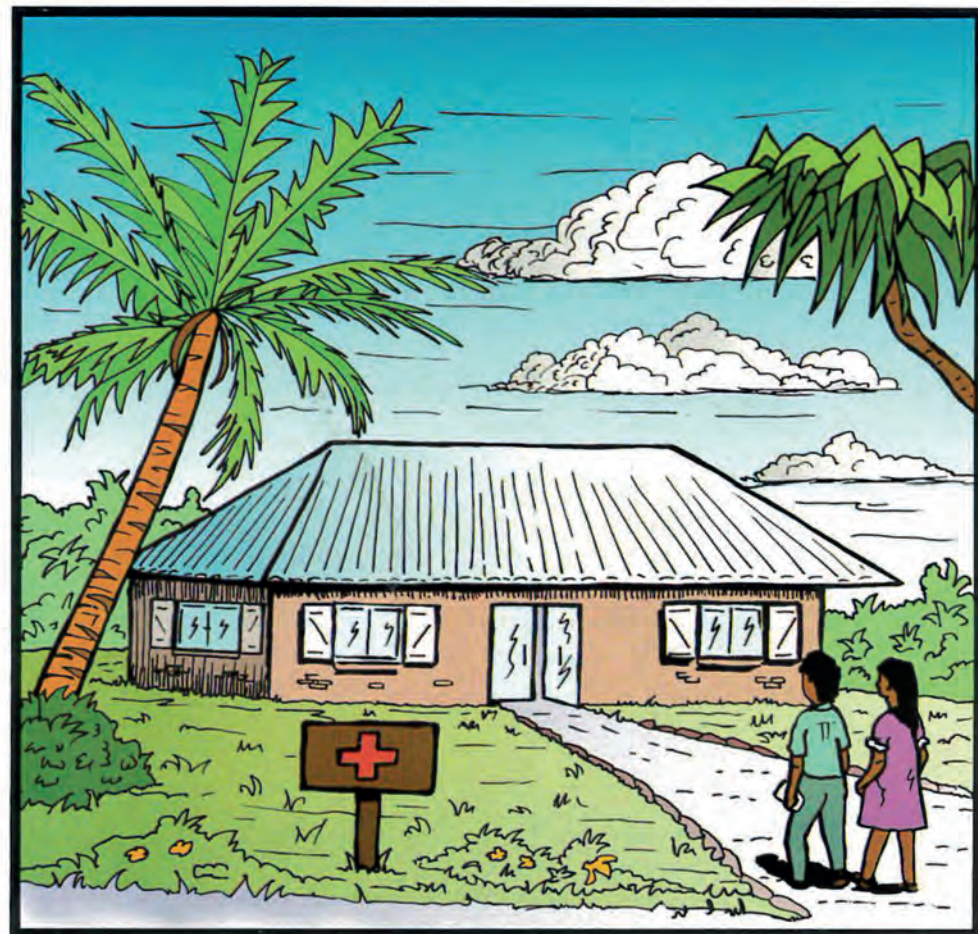
PREVENTION OF DIABETES



HEALTHY EATING FOR THE WHOLE FAMILY



EXERCISE



REGULAR HEALTH CHECK



RELAXATION AND STRESS MANAGEMENT

MANAGEMENT OF DIABETES

PART 2

One of the important ways of preventing damage to the body is to ensure that you keep the blood sugar level within the normal range.
International Diabetes Federation clinical practice recommended range for diabetes control: 4 to 6.1 mmol/L

HYPOGLYCAEMIA - LOW BLOOD SUGAR LEVEL - Below 3.5 mmol/L

The symptoms of hypoglycaemia are sudden.

The main symptoms are:

- feeling faint or dizzy
- feeling hungry
- perspiration
- difficulty concentrating.

People treated with insulin may have problems because their blood sugar levels fall too low, particularly if a meal is missed or delayed, or if the person has been involved in vigorous exercise. The symptoms of low blood sugar in people who are treated by tablets are less dramatic than those for people treated with insulin.

Treatment: immediately take some easily absorbed sugar, for example.

HYPERGLYCAEMIA – HIGH BLOOD SUGAR LEVELS: Over 8 mmol/L

If the level stays high over a long time you may suffer damage to various parts of the body. How do you find out if your blood sugar level is within normal range?

Symptoms of hyperglycaemia:

1. frequent urination
2. increased thirst
3. blurred vision
4. feeling fatigue
5. significant weight loss

1. URINE TESTING FOR SUGAR

If sugar is found in your urine it usually indicates that your blood sugar level is too high, causing some of the excess sugar to pass through the kidneys and come out in the urine.

By measuring the amount of sugar in your urine, you can get some idea of the level of sugar in your blood. Testing the urine provides only a rough guide. The common way of testing for sugar in the urine is to dip a plastic strip in the urine and compare the colour with the scale on the bottle.

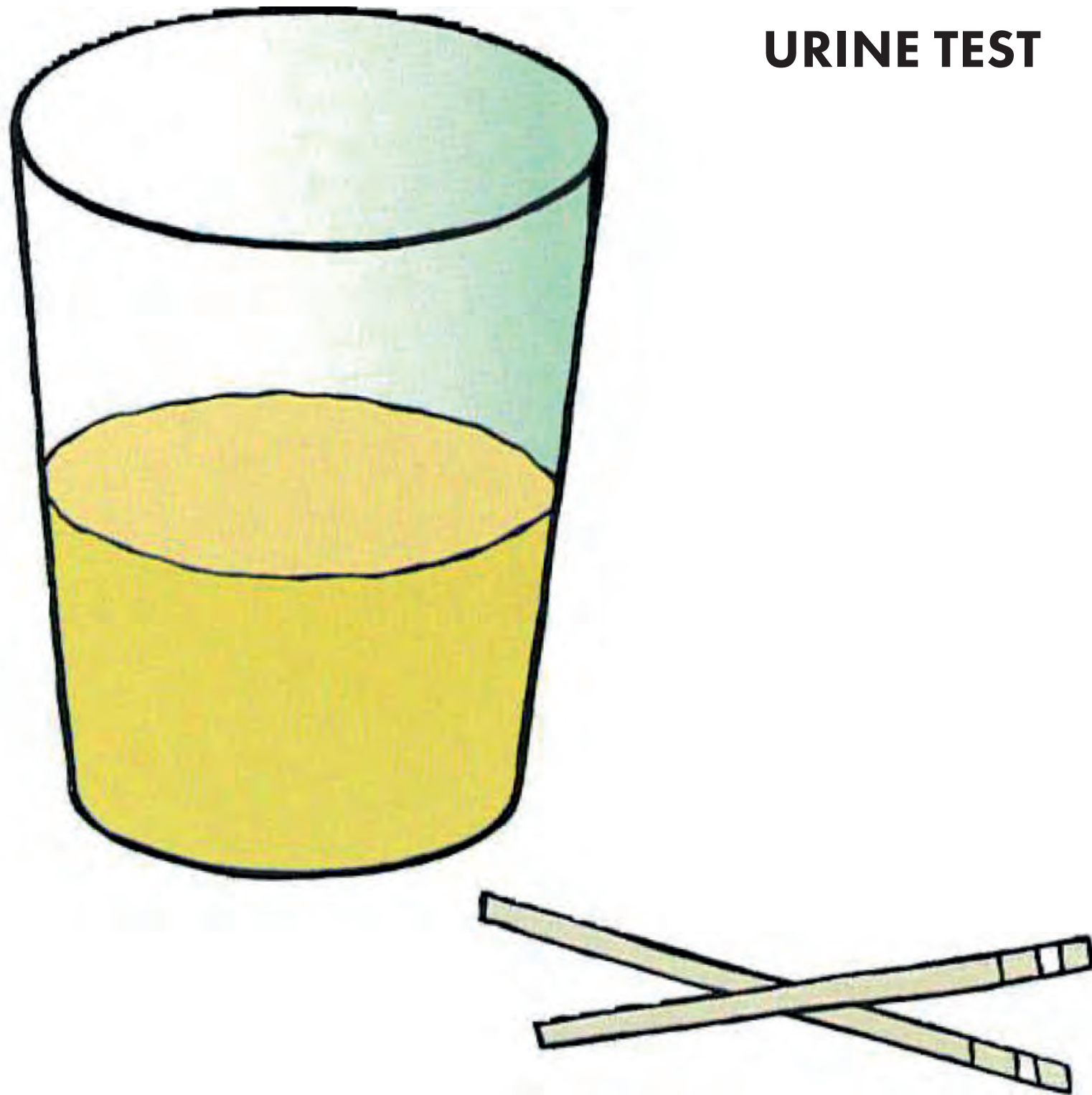
2. BLOOD SUGAR TESTING

An accurate way of measuring blood sugar levels is by a simple blood test.

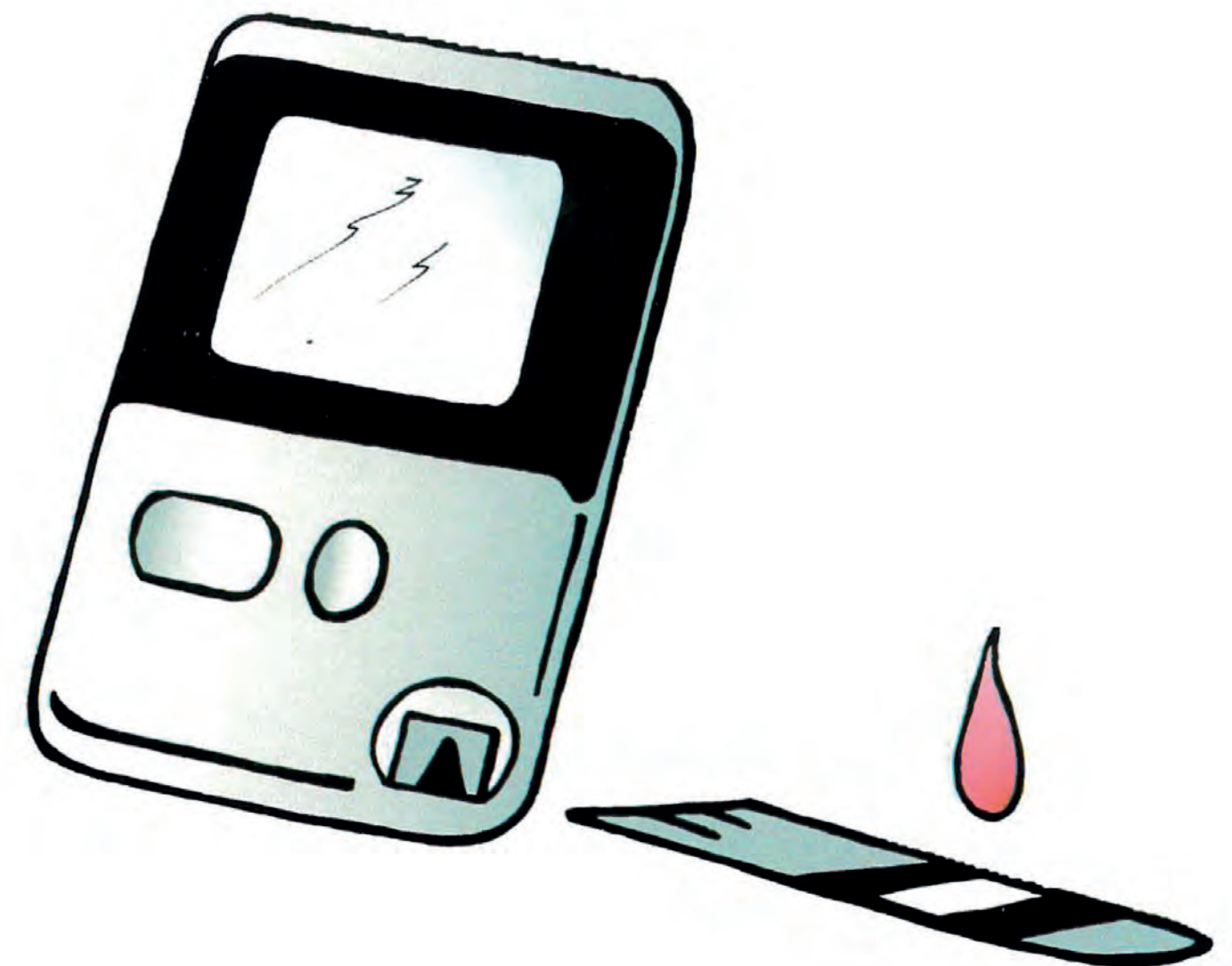
A drop of blood is obtained by pricking the finger. The drop is placed on a blood-glucose testing strip which will help indicate the blood sugar level. There are several types of strips. Timing, techniques and machines differ.

MANAGEMENT OF DIABETES

URINE TEST



BLOOD TEST



MANAGEMENT OF DIABETES

People with diabetes can lead a normal, healthy life. Diabetes can be managed by eating the right food, regular exercise and sometimes medication. All people with diabetes are different and need individual advice about diabetes management from a doctor or nurse.

1. Diet and healthy eating

Losing weight can make it easier for the insulin to work.

Eating fat stresses the pancreas and makes it work harder to produce insulin.

Eating sugar overloads the pancreas.

Eating too much food in one meal, or all at once, also stresses the digestive system.

- eat a variety of fresh foods
- eat less food but more frequently
- eat mostly fruit, vegetables, green leaves, cereals, root crops, bread and rice
- eat fish and meat moderately
- eat only a little fat, sugar and oil

2. Diet and tablets

There are two types:

- one helps the pancreas produce and release insulin
- one works on the gate of the cells to let sugar into the cells.

Tablets do not contain insulin. They work only when the body is producing some insulin.

3. Diet and insulin injection

Some people need insulin injections because the pancreas is not producing any insulin at all.

4. Diet and regular exercise

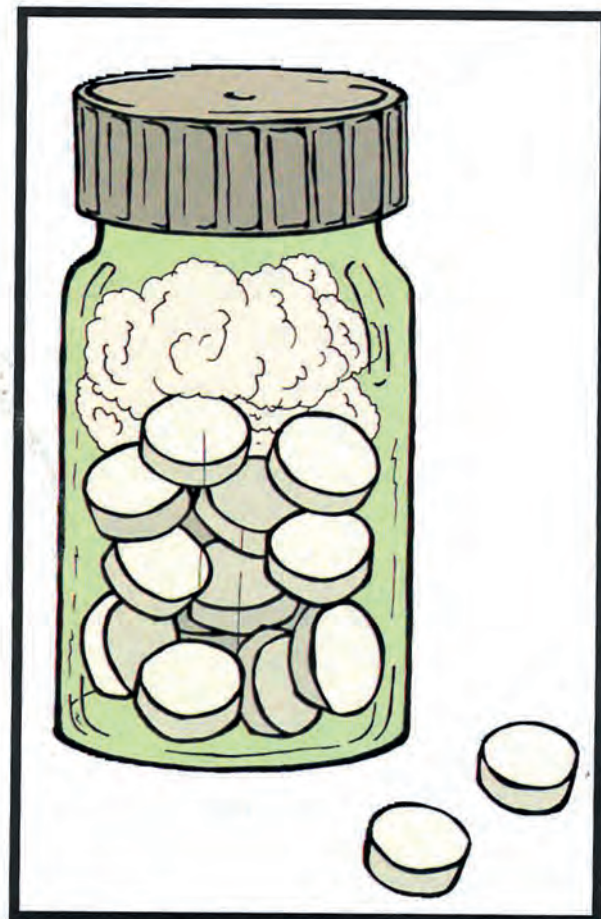
MANAGEMENT OF DIABETES



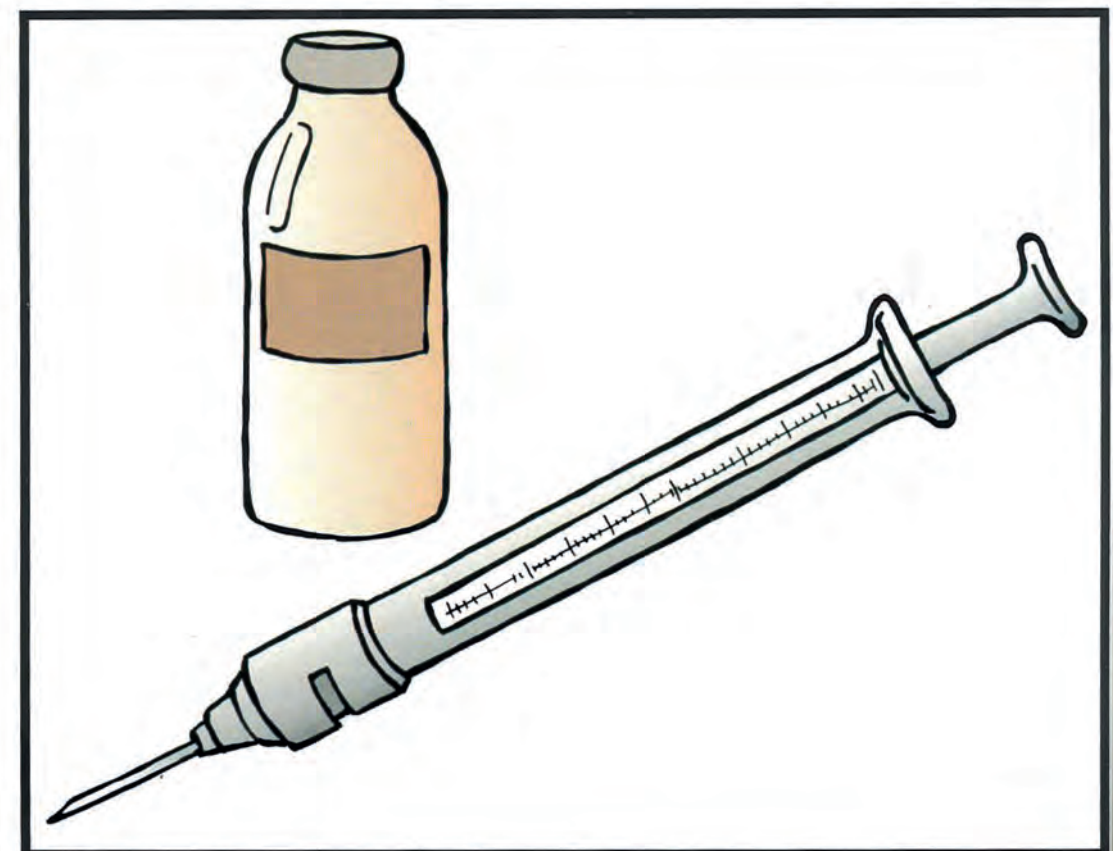
HEALTHY EATING



EXERCISE



TABLETS



INSULIN INJECTION

PREVENTION OF COMPLICATIONS AND DAMAGE TO THE BODY

There are some simple steps that a person with diabetes can take to prevent complications such as blindness, heart problems, kidney failure, limb amputation and nerve damage to organs of the body.

- **Healthy eating**
- **Regular blood-glucose checks**
- **Regular visits to the health clinic, doctor and/or community nurse**
- **Exercise**
- **Footcare**
- **Eyecare**

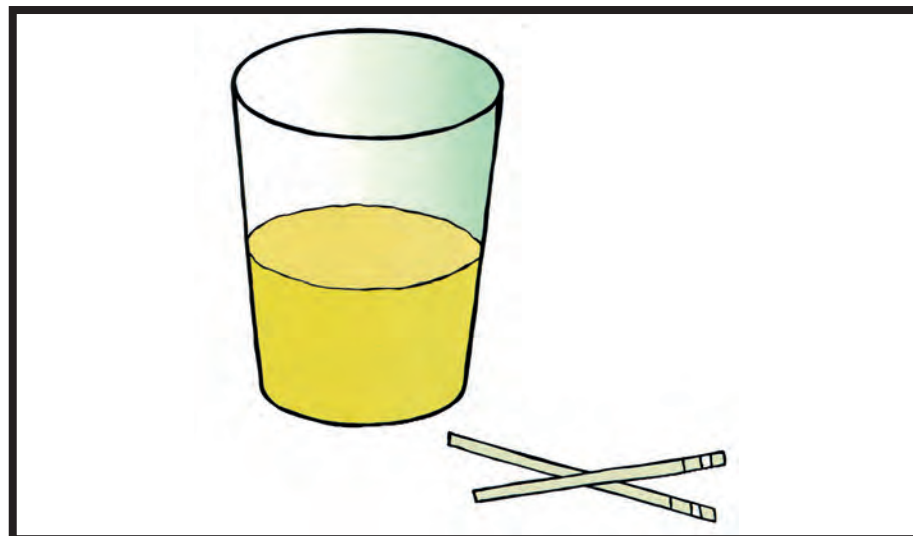
PREVENTION OF COMPLICATIONS AND DAMAGE TO THE BODY



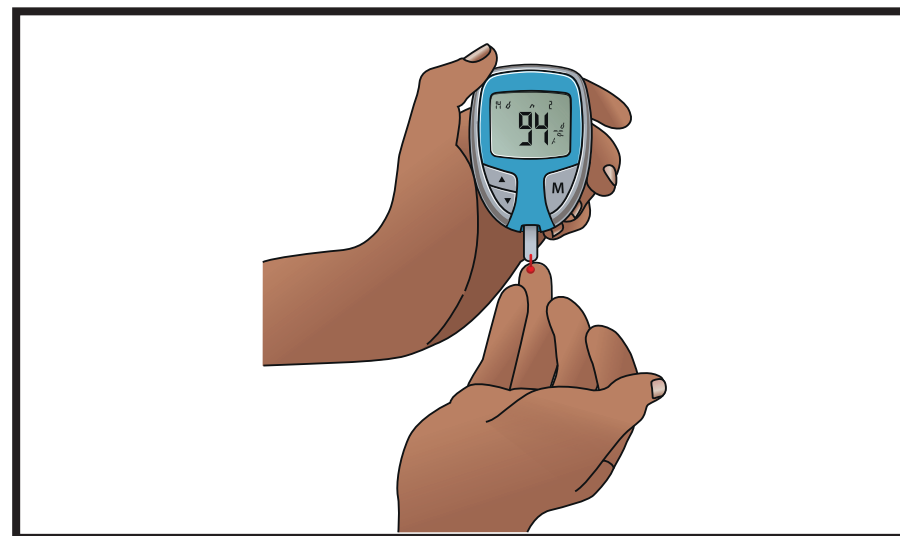
HEALTHY EATING



EXERCISE



**REGULAR BLOOD
GLUCOSE CHECK**



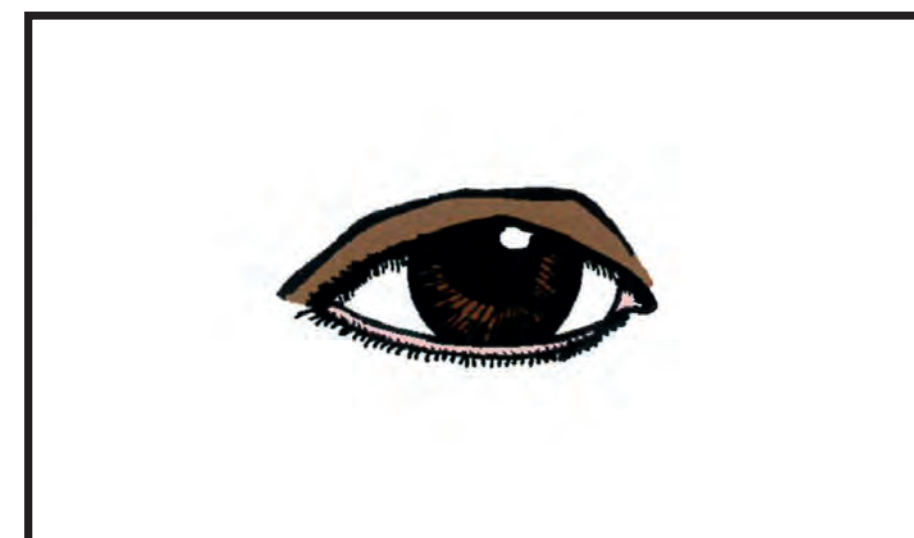
GLUCOMETER, STRIP AND LANCE



FOOT CARE



**VISIT DOCTOR,
HEALTH WORKER, NURSE**



EYE CARE

FOOT CARE

Diabetes can affect the feet in three ways:

1. diabetes can reduce sensation so that you may not feel pain when your feet have been injured. Your feet may feel numb or tingle;
2. diabetes can also affect the circulation in the lower limbs;
3. high blood sugar lowers your resistance to infection. The body's means of destroying germs is impaired and the tissues heal more slowly.

Demonstrate how to practise good foot care

The equipment you will need:

- A basin: make sure that it does not have any sharp edges and won't cause any harm to the feet. A plastic basin is ideal.
- A jug of clean water;
- A gentle soap;
- A white or light-coloured towel, cloth;
- Methylated spirits;
- A mirror;
- Moisturising cream (sorbolene cream).

- Fill the jug with warm water. Sit down comfortably. The chair should not be so high that you find it difficult to bend down.
- Pour the water into the basin and put one foot in it.
- Take your foot out of the water and soap it thoroughly, between the toes and at the heel.
- Rinse.
- Dry well, especially between the toes where the skin is likely to perspire. Check the towel for stains. If you find one, it means that there is a cut or an infection. You can see the stains better if the towel is a light colour.
- Use a mirror to check underneath the foot.
- Wipe between the toes and underneath them with a cotton-wool bud soaked in methylated spirits.
- Apply a moisturising cream and massage thoroughly to prevent cracking and splitting.
- Clip toenails. Keep toenails clean.
- Do the same with the other foot.
- If you find cuts or damage to your feet, go to the health clinic or your doctor immediately.

FOOT CARE



INTRODUCTION

This flipchart has been designed for the health worker to use at a community level. The language has been kept simple as it is expected that the health worker will translate the concepts into the relevant community language.

The flipchart is designed in two parts:

Part 1: What is diabetes?

Part 2: Management of diabetes

General community:

Part 1 is designed for a general audience where the educator is aiming to inform people about the physiology of diabetes and to present ways of preventing the condition.

People with diabetes:

Part 1 and Part 2 are designed for people with diabetes. Part 1 describes the physiology of diabetes and Part 2 describes the management of the condition.