

Type 2 diabetes: general guidelines

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Diabetes mellitus (DM) or diabetes is a chronic condition, for which there is as yet no cure available. At this point in time it is estimated that approximately 463 million people are suffering from diabetes worldwide.

And this number is expected to continue to rise to 700 million by 2045. In most countries the number of people with type 2 diabetes is increasing. 79% of adults with diabetes are living in low and average income countries. The majority of diabetes sufferers are aged between 40 and 59. We know that in this group one in two people have not yet been diagnosed with diabetes.

The data available for Belgium are limited and incomplete because there is no systematic registration when diabetes is diagnosed. Referring to data from health insurance providers and the Belgian Health Survey it is safe to conclude that the number has more than doubled in recent decades. It is estimated that type 1 and type 2 diabetes occur in 8% of the adult population in Belgium. Current predictions indicate that by 2030 this will rise to 9.6% or one in ten adults in Belgium. These data comprise known and unknown cases of diabetes (not everyone is aware that they are suffering from diabetes). Overall there are consequently more than 1 million Belgians with high blood sugar levels who qualify for prevention and treatment of diabetes and potential complications.

Diabetes is characterised by excessively high blood sugar levels. Healthy blood sugar levels can only be maintained providing you have a clear insight into your diabetes treatment. This brochure aims to help you along the way.

If you have further questions please do not hesitate to talk to your doctor, diabetes nurse or diabetes dietician.

WHAT IS DIABETES?

Our body converts carbohydrates or sugars from our food into **glucose**. The blood then transports the glucose to provide all our body cells with energy.

The absorption of glucose in the cells of most organs is regulated by **insulin**. Insulin is a hormone secreted by specialist cells (bèta cells) in the pancreas (an abdominal organ located behind the stomach).



In people with diabetes this **mechanism is disrupted** because the pancreas is producing very little insulin, no longer producing insulin or the insulin it produces is not effective enough.

A difference is made between type 1 and type 2 diabetes. There are also cases of pregnancy diabetes as well as 'specific' or 'secondary' types of diabetes.

WHAT IS THE DIFFERENCE BETWEEN TYPE 1 DIABETES AND TYPE 2 DIABETES?

Type 1 diabetes

Type 1 diabetes is an auto-immune disorder in which the body is attacked by its own immune system, which is disrupted and destroys the beta cells in the pancreas. The symptoms associated with type 1 diabetes usually occur within a short time span and are very specific. They include severe thirst, rapid weight loss, abnormal hunger, severe fatigue and frequent urination. These patients will always be treated with insulin.

Type 2 diabetes

Type 2 diabetes is a progressive, gradually occurring disorder characterised by:

- Reduced insulin effectiveness.
- Insufficient insulin production by the beta cells in the pancreas.

Type 2 diabetes is part of a **more extensive disorder** associated with resistance to the functioning of insulin. This resistance is the result of ageing, excessive accumulation of fat in the abdomen and muscles (usually associated with general obesity) and lack of exercise. That in itself already represents an increased risk of heart and cardiovascular problems such as a heart attack or stroke.

Blood sugar levels will rise only in people whose pancreas is unable to produce enough insulin. Type 2 diabetes, however, is a disorder with a much more extensive impact than just high blood sugar levels. It consequently requires a more wide ranging approach, involving a healthy lifestyle, weight loss, exercise, blood pressure monitoring, fat monitoring, etc.

Contrary to type 1 diabetes, many people with type 2 diabetes **will have few or no symptoms at the time of diagnosis**. In many cases (late) diagnosis happens by accident, e.g. during a work related medical examination or following complications such as a foot injury not healing properly, leg cramp, frequent bladder infections, a heart attack, etc.

However, a lack of symptoms does not mean that there are no risks, because excessively high blood glucose levels lead to **gradual injury** of the blood vessels and nervous tissue.

WHAT IS THE TREATMENT FOR TYPE 2 DIABETES?

The treatment for mellitus type 2 diabetes is based on four equally important steps.

1. Healthy balanced nutrition



2. Adequate exercise



3. Careful weight monitoring



4. Medication



I. NUTRITION

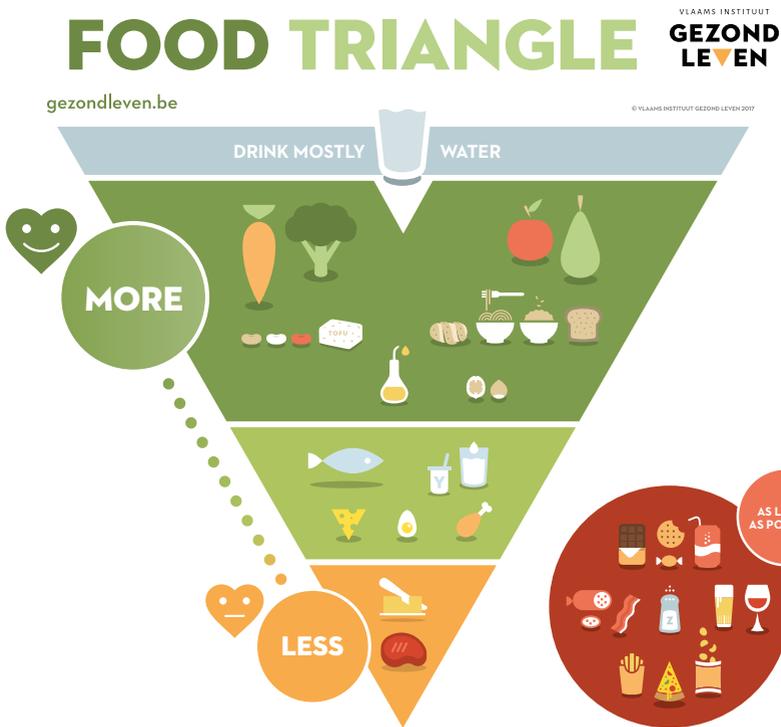
Balanced nutrition is a significant part of any diabetes treatment. It is based on the healthy eating food pyramid, which is divided into different sections. Each section has a different colour, ranging from red to orange and green. The colour of a section reflects the impact that foods from that section have on our health. To put together a balanced diet, preference is given to foods from the green groups. Foods from the red group are best avoided whenever possible.

If you have diabetes, it is advisable to **limit your intake of carbohydrates**. It is important to be aware of which foods contain carbohydrates.

Typical examples of foods with carbohydrates include:

- Sweets, ice cream, sweet sandwich fillers, soft drinks, alcoholic drinks, etc.
- Deep fried snacks, crisps, cake, tarts, chocolate, biscuits
- Dairy products (except cheese) and vegetable soy drinks
- Vegetable drinks based on grains, nuts and seeds
- Grain based products and potatoes
- Fruit
- Pulses (beans, lentils and chickpeas)
- Some vegetables (parsnips, sweetcorn, peas, beetroot, artichokes, leek, green celery, etc.)

A balanced diabetes diet based on the food pyramid



WATER

Water or moisture is a vital component in the body. The body's moisture level must remain balanced every day. Under normal circumstances the body requires

1.5 litres of moisture, preferably water. Unsweetened coffee or tea is ok for a change. Drinks containing less than 5 kcal do not affect the blood sugar level. However, the same cannot be said for fruit and vegetable juices, alcoholic drinks, sweetened soft drinks and sports drinks.



DARK GREEN

These foods have a beneficial impact on your health. Try to choose non processed options whenever possible as they have a beneficial impact on your blood sugar levels.

- **Fruit:** all types of fresh fruit are healthy. No fruits are forbidden for people with diabetes but the number matters (maximum two per day). Some types of fruit contain more carbohydrates, so be careful with bananas, grapes, cherries and oranges and adjust their portion size. Fruit is an important source of vitamins, minerals and soluble dietary fibre.
- **Vegetables:** opt for a large portion of vegetables with bread and hot meals. Soup is also highly recommended. Most vegetables are low in carbohydrates but supply mainly soluble dietary fibre, vitamins and minerals.
- **Whole grains and potatoes:** choose whole-wheat (fibre rich) grain products such as whole-wheat pasta, brown rice, brown bread, etc. Grains and potatoes are an important source of carbohydrates in the form of starch. Adapt the quantity to your personal daily routine.



- **Pulses and meat substitutes:** pulses offer many benefits. It is advisable to eat them at least once a week. Pulses provide carbohydrates but they lead to a slow rise in blood sugar levels and they have a satisfying effect. Because pulses contain carbohydrates it is best to reduce other sources of carbohydrates (such as potatoes, rice, bread, etc.) with meals that include pulses. Pulses are excellent meat substitutes. Other meat substitutes include tofu, tempé, seitan and quorn. Choose varieties that have not been deep fried.
- **Nuts:** a handful of nuts every day is healthy. Nuts are a fatty and high energy food so it's best to keep it to a handful a day.
- **Oils and fats:** opt for vegetable oils but avoid palm oil and coconut oil. You could also opt for liquid margarine. Use one tablespoon of fat for a hot meal. Apply a very small amount of butter/margarine type spread (spreadable and available in tubs) to each slice of bread.

LIGHT GREEN

- **Fish:** eat fish once a week and include both oily and non-oily types of fish.
- **Dairy products:** dairy products naturally contain carbohydrates in the form of lactose. Choose product types without added sugar such as (butter)milk and yoghurt sweetened with low calorie sweeteners. Soy based drinks (natural) enriched with calcium are also good.
- **Cheese:** cheese does not usually contain carbohydrates but is a source of saturated fats. Opt for low fat varieties.
- **Eggs:** eggs are part of a healthy diet. Eggs are an excellent meat substitute and do not contain carbohydrates.
- **Poultry:** opt for white meat (chicken and other poultry) instead of red meat (four-legged animals) and fresh rather than processed. Give preference to low fat types of meat.



ORANJE

Limit the use of butter, semi-skimmed butter, coconut and palm oil, hard margarine and red meat.

RED (these foods are not included in the food pyramid)

Foods in the red group are highly processed products with a lot of added sugar, fat and/or salt.

Their use should be minimised. The same applies to chocolate, biscuits or cakes without added sugars and alcohol free drinks containing a lot of sugar (soft drinks, fruit juices, etc.).

Tips for a healthy lifestyle

- ✓ Water is the most important type of drink. Make sure you drink enough, even if you don't feel thirsty.
- ✓ Eat more vegetable based than animal based foods.
- ✓ Opt for foods that have been subjected to little or no processing.
- ✓ Avoid highly processed food products.
- ✓ Eat a varied diet to prevent it from becoming monotonous and imbalanced.
- ✓ Eat at set times. Eat three main meals and if necessary three snacks per day.
- ✓ Limit the use of salt.
- ✓ Take enough exercise, as illustrated in the activities triangle below.

2. EXERCISE

A minimum of 30 minutes of moderate intensity exercise per day is recommended. Moderate intensity exercise will accelerate your breathing and heartbeat, but you should still be able to hold a conversation.

It is not just important to take enough exercise, you should also limit your time sitting down. Long periods of sitting down are not recommended and should be interrupted every 20 to 30 minutes.



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3. HEALTHY WEIGHT

Approximately 70% of people with type 2 diabetes are overweight or obese at the time of diagnosis. Weight loss is consequently often a first and significant step of the treatment.

The level of being overweight is defined by the BMI, which is calculated using:

The following formula:

$$\frac{\text{Weight (kg)}}{\text{Height x Height (m)}}$$

Example.

Your height is 1.7 m and you weigh 83 kg.

Your BMI is: $83 \text{ kg} / 1,70 \times 1,70 \text{ m} = 28,7 \text{ kg/m}^2$

BMI

Less than 18,5	→	You are underweight.
18,5-25	→	Healthy weight, try to keep it that way.
25-30	→	Slightly overweight, try to lose a few kg.
Above 30	→	Obesity with increased risk to health, this definitely requires treatment.

4. MEDICATION

Alongside a healthy lifestyle, medication is also an important aspect of the treatment of type 2 diabetes. The doctor in charge of your treatment will decide on an appropriate therapy. This could be based on a single drug (monotherapy), or several drugs may be administered at the same time. This is described in detail in the brochure entitled *Type 2 diabetes: treatment*.

MEASURING YOUR BLOOD SUGAR LEVELS

IMPORTANCE OF MEASURING YOUR BLOOD SUGAR LEVELS



The treatment uses medication to try and reach normal blood sugar levels. A normal blood sugar level (= glycaemia) relates to a value between 80 and 150 mg/dl.

Your glycaemia can be monitored in two ways:

- 1 Monitoring by your GP every three months with a blood sample.
- 2 Using a blood glucose monitor. This will tell you immediately whether your blood sugar level is under control. You will have to buy this equipment yourself from a home care store or pharmacy.

THINGS TO REMEMBER WHEN MEASURING YOUR BLOOD SUGAR LEVELS

How should you measure your blood sugar levels?

- ✓ Wash your hands.
- ✓ Prepare the monitor: insert the strip in the unit.
- ✓ If your monitor requires a code, check the code number.
- ✓ Prepare the lancet: it should be replaced every day (in the morning).
- ✓ Tension the spring.
- ✓ Place the lancet on the side of your fingertip.
- ✓ Prick and push the blood towards your fingertip. Always rub from the base of your finger to the top.
- ✓ Once you have an adequate drop of blood, allow the strip in the monitor to absorb it.
- ✓ Wait for a few seconds and check the result on the monitor.
- ✓ Record the result in your diabetes diary.

What if your blood sugar level is too low?

Low blood sugar is also referred to as hypoglycaemia or hypo for short. This refers to a blood sugar level below 60 mg/dl. A hypo will make you feel uncomfortable. Potential symptoms include shaking, perspiring, dizziness, hunger, poor vision, headache, pallor, etc.

HYPOGLYCEMIA SYMPTOMS



PERSPIRING



PALLOR



MOOD SWINGS



HUNGER



DIZZINESS



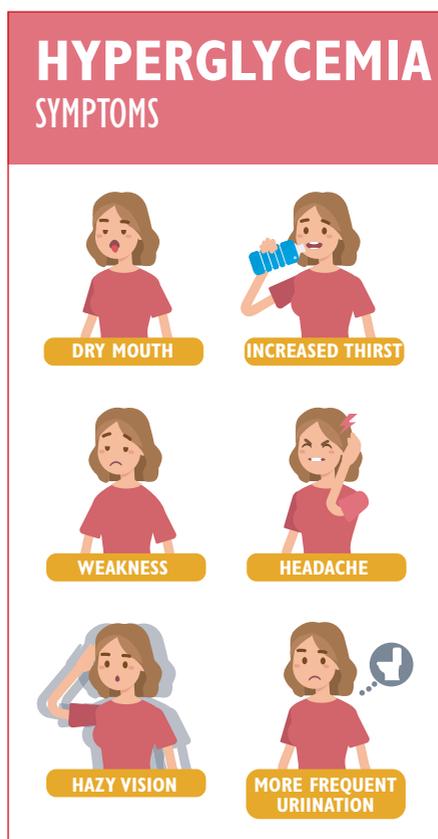
FATIGUE

- 1 Act immediately, don't wait until you suspect you are experiencing a hypo.
- 2 If you don't feel well, measure your blood sugar level immediately.
- 3 If your blood sugar level is below 60 mg/dl, you must ingest fast acting sugars immediately:
 - Take 10 g of dextrose (3 to 4 tablets).
 - Drink a glass of water.
- 4 Wait 10 to 15 minutes.
- 5 Record the hypo and the time it happened in your diabetes diary.
- 6 If in doubt check again.

What if your blood sugar level is too high?

A one-off high blood sugar level (= hyperglycaemia) is no reason to panic.

If you notice that your blood sugar levels exceed 200 mg/dl for an extended period, you should contact your GP or the doctor in charge of your treatment.



IMPORTANCE OF YOUR DIABETES TREATMENT



Successful blood sugar regulation aims to prevent long term diabetes complications. If you control your blood sugar levels successfully the risk of complications will be minimal.

Complications can be categorised into three groups:

1. Cardiovascular disorders (heart, legs, brain, eyes, kidneys).
2. Nervous system disorders.
3. Infections and foot problems.

I. HEART AND CARDIOVASCULAR DISORDERS

Involving the heart and major arteries

People with type 2 diabetes are at increased risk of developing cardiovascular disorders. The following recommendations are aimed at reducing this risk:

- ✓ A healthy lifestyle
 - Healthy diet
 - Acceptable weight
 - 30 minutes of exercise each day
 - Stopping smoking
- ✓ Successful monitoring of blood fats, including cholesterol (if necessary with medication)
- ✓ Strict blood pressure monitoring (if necessary with medication)

- ✓ As part of the preventive measures the doctor may ask you to do a cycle test or have an ultrasound scan of the carotid arteries (blood vessels on both sides of the neck).

Involving small blood vessels (eyes and kidneys)

- ✓ Successful diabetes management will have a beneficial impact on the small blood vessels.
- ✓ Our preventive measures we will also include an annual
 - eye test
 - 24-hour urine test

2. NERVOUS SYSTEM DISORDERS

Successful diabetes management will prevent nerve damage.

3. FOOT PROBLEMS

Foot problems usually occur for a combination of reasons:

- ✓ Circulation problems.
- ✓ Reduced sensitivity due to nerve damage problems.
- ✓ Slow wound healing because of higher blood sugar levels.

If you develop a small wound on your foot, you may not be aware of it immediately because it is less or not at all painful. The wound will also heal more slowly. Prevention is always better than cure and you can do this by taking a number of simple measures.

Prevention is always better than cure.

1 Wash your feet daily

- Limit foot baths to five minutes to prevent weakening of the skin.
- Limit the water temperature to 37 °C.
- Dry your feet properly, including between the toes.
- Apply a moisturising cream daily but avoid the area between the toes.



Wash your feet daily.

2 Foot care

Do not use metal nail clippers or files.

Cut your toenails straight across.

Check your feet for wounds every day.

- Have your nails cared for regularly by a pedicure or podiatrist.
- Do not use metal nail clippers or nail files.
You can use hard cardboard files if necessary.
- Cut your toenails straight across to just above the edge of the toe.
- Do not use potent ointments or plasters to remove corns or calluses.



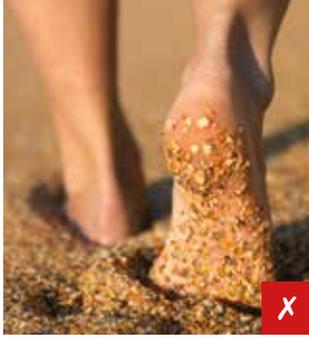
Do not use metal nail clippers or nail files.



Cut your toenails straight across.



Check your feet for wounds every day.



Never walk around barefoot.

- Check your foot soles and the area between the toes for wounds daily.
- Never walk around barefoot, not even at home.

3 Think about socks and shoes

- Change socks daily.
- Preferably wear woollen or cotton socks with no holes or thick seams to prevent chaffing.
- Don't wear socks or shoes that are too tight.



Don't wear socks or shoes that are too tight.



Don't wear worn out socks.

4 Warm up cold feet correctly

- Avoid burns as a result of using a hot water bottle or cherry stone pillow.
- Wear bed socks if necessary.



5 Consider your sitting position.

- Sitting cross legged will inhibit the circulation to the feet.



DRIVING LICENCE

Legally, anyone suffering from diabetes must have an [adapted driving licence](#), even if your diabetes is being treated solely with an appropriate lifestyle or tablets. Legally, a driving licence needs to be updated within four days of a diagnosis, although this is not feasible in practice because doctors will only issue a driving ability certificate once they are satisfied that the patient is monitoring the diabetes successfully. It is important for you to be aware that your diabetes will not be mentioned on your driving licence.

To obtain this updated driving licence the doctor in charge of the treatment needs to complete a driving ability certificate, which is a standard form, on the basis of the diabetes treatment.

INSURANCE

Car insurance is mandatory. The premium is not higher for people suffering from diabetes. Insurance providers **must not refuse patients because they have diabetes**.

The law does stipulate that the insurance provider must be aware of the fact that the patient has a driving licence with a limited validity period.

To this end the patient must submit a copy of their driving ability certificate and/or a recto-verso copy of the updated driving licence to the insurance provider. To prevent future discussion it is advisable to send this by registered post or with a request for proof of delivery.

The maximum validity period of the driving licence depends upon the type:

- Personal driving licence: maximum 5 years
- Professional driving licence: maximum 3 years

FURTHER INFORMATION

Do you have problems or further questions?

- ✓ If so, please contact the diabetes nursing staff
 - on 016 34 34 75

- ✓ You can also find appropriate information online via
 - UZ Leuven: www.uzleuven.be/diabetes
 - Or the Diabetesliga: www.diabetes.be

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