

# LIVING WITH DIABETES: *I can do it!*

A patient empowerment booklet



MANAGE CARE STUDY GROUP

LIVING WITH DIABETES:  
*I can do it!*

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# what can this *booklet* do for me?

In this booklet we would like to answer questions like:

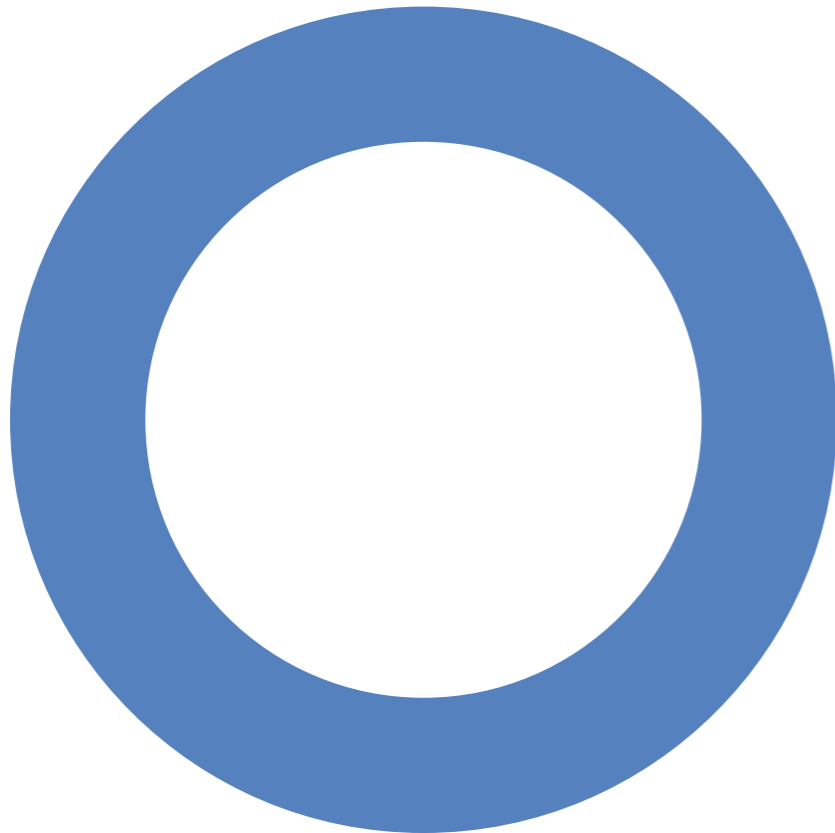
- What is *my* role and what tasks are *mine* in diabetes treatment?
- What does “empowerment” mean?
- What are the basic issues I should pay attention to, in my diabetes treatment and care?
- How can I work together with my health care professionals, my community, patient associations, family and friends in order to improve my overall care?

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Diabetes is a *chronic disease*. This means it usually persists lifelong. Its symptoms are barely noticeable, especially in the beginning. Patients often think: *“My doctor says that I am a diabetic, but it doesn’t hurt at all”*.

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The troublesome fact, however, about chronic diseases is that they often are progressive (which means worsening) and then may lead to severe complications, disability and even premature death. A successful treatment of a chronic disease usually does not result in its cure, but rather in its good control and patients’ improved state. This is something desirable and beneficial, because it avoids complications.



In the case of diabetes this means to achieve and to maintain adequate blood glucose values and at the same time normal blood pressure, blood cholesterol, avoidance of sedentary life, weight control, and stopping smoking. If these goals are met, complications can be prevented:

- both acute, such as producing a lot of urine and feeling fatigued,
- and even long term, such as diabetic foot syndrome, kidney failure or blindness.

So, even if you are disappointed that a chronic disease cannot be cured, do not underestimate the benefits of a favourable treatment which “only” improves your state of health. It prevents the worsening of the disease and ensures a good quality of life.

Now, imagine you are sitting in the centre of your diabetes care team [fig. 1]. You are the one taking care of your life and your disease on a daily basis. The more you get involved in your treatment the more successful this can be.



FIGURE 1: THE DIABETES CARE TEAM

Around you, a whole range of persons and institutions can be observed. The big challenge of chronic care management is to involve this social environment, community resources, health care providers, health insurance and others, in a well coordinated and accessible way.

As you are seen in the centre of the care process and considered as an active partner, you should be as well informed and educated about your chronic disease and about the responsibilities of all the partners aiming at an improvement of your condition. Your challenge and chance is to engage yourself in the treatment process and act as a person who is empowered to do so.



The following chapters of this booklet explain some important aspects of type 2-diabetes therapy.

The booklet does not substitute personal diabetes education.

It is your right to participate in a specific diabetes educational programme.

Ask your therapeutical team or your diabetes association about local diabetes educational activities.

**EMPOWERED-ACTIVATED PATIENTS**

- understand their health condition and its effect on the body
- feel able to participate in decision-making with their health care professionals
- feel able to make informed choices about treatment
- understand the need to make necessary changes in lifestyle for managing their conditions
- are able to challenge and ask questions to the health care professionals
- take responsibility for their health and actively seek care
- actively seek out, evaluate and make use of information
- raise personal issues which affect motivation and capability to participate/ cooperate in their care/therapeutic process

*Accept the challenge to **change** your care!*



Here is a quiz that will help you clarify your knowledge regarding nutrition. We advise you to answer the following questions by ticking the right answer, before and after having read the chapter. You can find, however, the right answers within the text.

**1. In overweight persons with type 2-diabetes, weight reduction is a primary means of treatment.**

- a. True
- b. False

**2. Which component (nutrient) of our foods provides the highest amount of calories?**

- a. Carbohydrates
- b. Protein
- c. Fat

**3. Which amount of cucumber do you need to eat in order to ingest 100 kcal?**

- a. 250 grams
- b. 500 grams
- c. 750 grams

**4. Which amount of oil do you need to eat in order to ingest 100 kcal?**

- a. 10 grams
- b. 25 grams
- c. 50 grams

**5. There are magic drugs or foods which blow-up or melt away our fat tissues.**

- a. True
- b. False

**6. A modest weight loss of 3 to 5 kilograms within half a year is a good success!**

- a. True
- b. False

**7. Set-backs in the weight reduction process are normal.**

- a. True
- b. False

**8. The weight reduction concept has to fit to the preferences of the individual patient.**

- a. True
- b. False

**9. Normal weight persons with type 2-diabetes should continue to lose weight.**

- a. True
- b. False

**10. Persons with diabetes treated with insulin should know to estimate the carbohydrate-content of their meals and to match it with the adequate dosage of insulin injected.**

- a. True
- b. False



SECTION FOR  
OVERWEIGHT PERSONS  
WITH TYPE 2-DIABETES

The eating behaviour is remarkably linked to type 2-diabetes. First of all, overweight –as a result of abundant eating combined with scarce physical activity– causes the manifestation of the disease, and weight reduction is the first therapeutic measure to be taken in overweight persons with type 2-diabetes mellitus.

As a background information you should know that a substance called “insulin” is involved in this matter:

- Insulin is produced in the human body and is responsible for reducing an elevated blood sugar.
- In persons with type 2-diabetes the possibility to produce insulin is reduced.
- The less overweight you are, the better your insulin can do its job to reduce the blood sugar.

*For an overweight person, losing weight is not a matter of esthetic but it is the first therapeutic measure to treat type 2-diabetes. Thus the body needs less insulin and the limited remaining insulin may again fulfil its task and return the blood sugar to a normal level [question 1].*



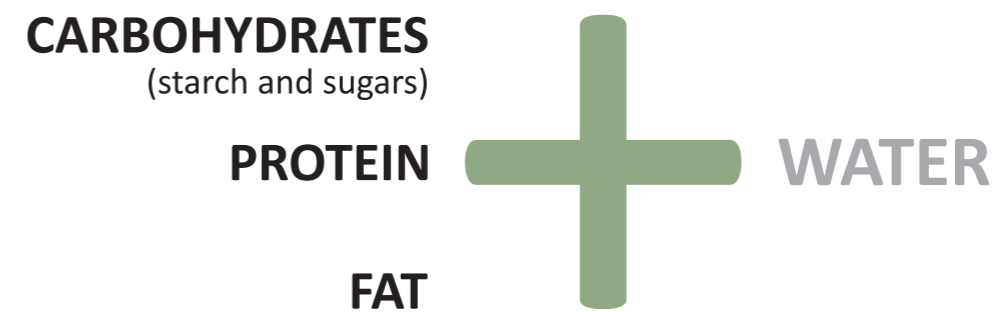
# Basic *facts* about weight loss & weight gain

From the cognitive point of view, losing weight is very easy:

Just consume less energy than you need and you will reduce body weight – this is a fact and the mechanism for success in weight reduction.

Middle-aged-to-elderly persons need about 1,500 to 2,000 kilocalories (kcal) per day to maintain their body weight. Eating less than needed results in weight loss. Let’s imagine a person with an energy need of about 1,500 kcal per day who ingests just 1,000 kcal (which equates to a daily deficit of 500 kcal). This reduction in calorie consumption results in a loss of body fat of about 1 kg – if this person manages to do so for **two** weeks.

The food we eat contains  
–besides vitamins and minerals–  
three main nutrients:



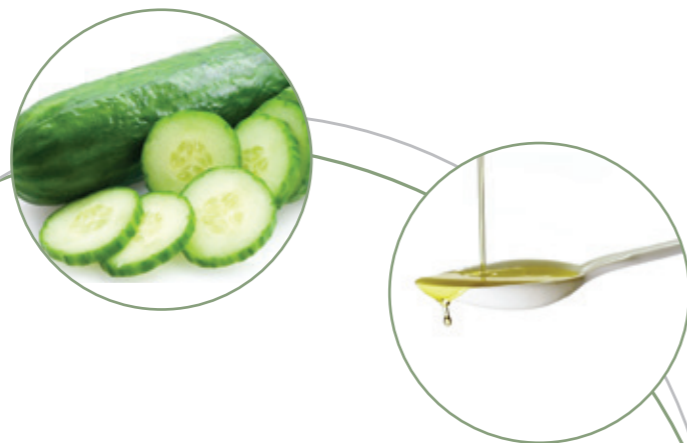
# Calorie content of nutrients and food

- 1 gram of pure carbohydrates (such as sugar) contains 4 kcal.
- 1 gram of protein contains 4 kcal as well.
- Fat provides much more energy: 1 gram of pure fat (such as oil) contains 9 kcal.
- On the contrary water does not provide any energy – not one single calorie [question 2].

The more water solid foods contain, the lower their energy content is; the more fat foods contain, the higher is the energy load.

**let's compare two extremes:** A food rich in water, such as cucumber, with a food rich in fat, such as oil. How much do you need to eat from these foods in order to ingest 100 kcal?

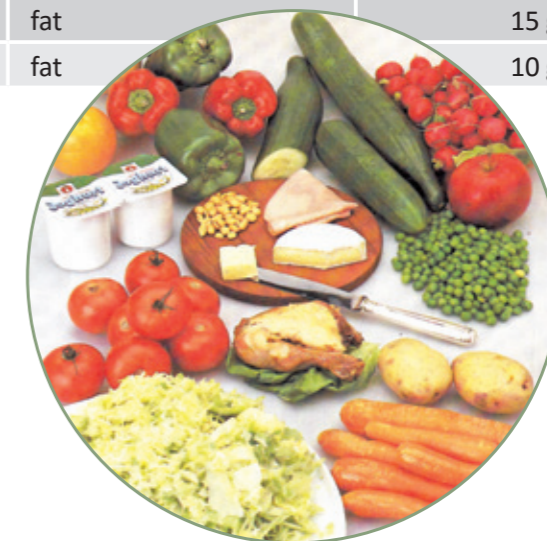
**answer:** Two cucumbers (some 750 grams) or 1 table spoon of oil (about 10 grams) [questions 3+4]



In the following table and the photo you can see some more foods. The indicated amount of each food illustrated on the photo provides 100 kcal.

As you may see in the list and on the photo the foods rich in water (vegetables) are going to support you because even big amounts eaten do not jeopardize your idea to lose weight. Foods rich in industrial sugar and fats won't support you because they are very energy-dense and even little amounts provide a high calorie intake.

Food	rich in ...	amount of food providing 100 kcal
Cucumber	water	700-800 g
Tomatoes	water	500-600 g
Carrots	water	350-400 g
Apple	carb: natural sugar	200 g
Fish	protein	70-130 g
Cheese low fat	protein	40-50 g
Bread	carb: starch	40-50 g
Sweets	carb: industrial sugar	25 g
Cheese high fat	fat, protein	25 g
Chocolate	fat, sugar	20 g
Peanuts	fat	15 g
Butter	fat	15 g
Oil	fat	10 g



The amount of each food illustrated on the photo provides 100 kcal

During your decision process concerning weight reduction and lifestyle change there are at least three aspects to consider:

- Misleading diets and expectations
- Crucial concepts for a long lasting success in changing eating habits
- Recommendable strategies



# Misleading diets and expectations

In newspapers, magazines and other media often inexcusable advertising and propaganda occur, such as:

**OUR MAGIC-TABLETS BLOW UP ALL YOUR FAT TISSUES!**

Within 2 weeks you can lose 8 kilos of body weight – with guaranteed long-term weight loss maintenance!

**M...-DIET:**

5 kilos of weight loss per week!

No regain of lost weight!

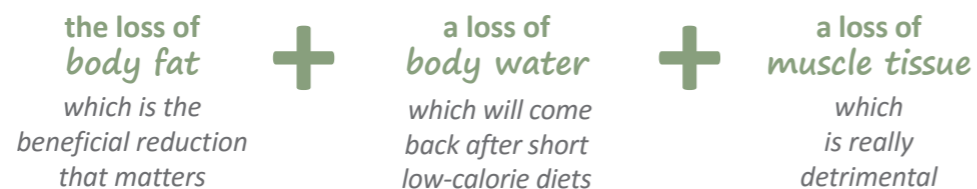
**THE SOUP-DIET:**

8 Kilos of weight loss in 7 days

**NO HUNGER, NO BAD MOOD!**

Such advertising is unwarranted [question 5]. Consider that one kilogram of body fat tissue stores an energy amount of about 7,000 kcal. Even if somebody ingests 1,000 kcal less than one's energy need, a total of 7 days would be necessary to lose just 1 kg of body fat tissue.

Unwarranted advertisement never states the reduction in body fat, which is the crucial figure. They state weight loss in general. But the total weight loss shown on a scale is always composed of:



Diets which produce a high (temporary) loss of water and a high loss of muscle tissue are not recommended. Go for dietary interventions which mainly reduce body fat and save muscle tissue!

The general population is strongly influenced by such unwarranted promises in respect to the effects of diets. As a result of these daily transmitted unwarranted promises the expectations of participants at the beginning of weight reduction programs often are extraordinarily utopian and unrealistic. Expectations of 10 to 15 kg of weight loss within the first 6 months after program start are observed.

Only less than 1 out of 10 participants of common weight reduction programs achieve such a high weight loss within 6 months. It is known that weight loss interventions produce modest weight loss (about 3 to 5 kg) within 6 to 12 months. They are most effective when intensive and combined with behavioral therapy. Maintenance strategies help to retain achieved weight loss.



# Crucial concepts for a long lasting success in changing eating habits

Reading these figures, please don't step back disappointedly. Losing 3 to 5 kilograms within half a year is very successful [question 6], because we are far from rational beings and we are rarely driven by rational arguments. Well-established habits and routines direct our behavior. In addition, we encounter multiple environmental influences, such as the temptations of consumption by persuasive advertisements, the seductive smells of bakeries, invitations to a barbecue party, or all-you-can-eat-offers; we savor the rewards of tasty food; or we try to compensate frustrating and sad moments by eating and drinking.

## At least three aspects are crucial for a long lasting success in changing eating habits:

- The lifelong aspect of behavior change instead of a short diet approach.
- "Make changes small!" & "Give yourself time to adjust!"
- "Set-backs are normal! [question 7] You need various takes and tries! Eating habits took time to be established during 20, 30 or 40 years, so don't expect to change them within 20, 30 or 40 days - not even weeks!"

*It's not like hurrying down a nice slope – it's like walking in the mountains down to the valley (of success).*



There are many reasons to revert back to old habits and you need a coping plan. Please plan in advance what may be your strategy after a party with abundant eating (→ e.g. 2 days of vegetable preference), or if you are bored (→ e.g. visit a friend, go to the cinema instead of eating). Create your list of rewards and recompenses which do not include food. Keeping a weight chart might be helpful.

# Recommendable *strategies* to change your dietary habits and to lose weight

For decades an **energy-restricted diet low in fat and high in carbohydrates** was commonly recommended for weight reduction, following the idea to limit the most energy-dense nutrient – the fat. The restriction of fat consumption was considered the most “logical” way to achieve an energy deficit with a subsequent reduction of body fat/body weight.

In the last 20 years there is an increasing number of studies and publications about the effects of diets with a composition different from the traditionally recommended one, in particular **diets high in protein and lower in carbohydrates** (without distinctively restricting fat consumption). Originated from different parts of the world respective concepts such as the “Atkins-Diet”, the “Mediterranean Diet” or the “Atlantic Diet” became popular and were studied in respect to their effects on weight reduction and the prevention of coronary heart disease.

As till now, there is no evidence for an unequivocal preference of a specific composition of the diet in respect to long term weight reduction. A commitment in favor of “The-one-and-only-diet” is not justified. For the diabetic patient an improvement in insulin sensitivity is important – and this effect is correlates with the amount of weight loss. For that reason the suitable weight reduction concept within a diabetes treatment intervention should be chosen according to local/national habits and conditions as well as according to the preferences of the individual patient [question 8].



## Get *ready*

The best way to prevent acute and long term complications of diabetes is your active participation in the treatment and answer the following questions in a prevailing or totally **positive** way!

- **Is it important for my health and my quality of life to change my eating behavior and reduce weight?**
- **Am I ready to start the process of dietary change and weight reduction right now?**
- **Am I confident that I will make and enjoy it?**

If you answered one or more of these questions in a doubtful or reluctant way, do not start with weight reduction right away, but start to identify the circumstances and obstacles which make you hesitant. Changing your eating behaviour should not be perceived as a burdensome duty and obligation – it should be an interesting challenge which gives you the opportunity to discover new delightful recipes, to experience physical well-being, to enrich your life breaking the routine.



**What should happen and what can you do in your life in order to feel positive about the implementation of a dietary change in your everyday life?**

During this process of motivation for lifestyle change you are not alone.

Ask members of your health care team or your health insurance company and people and friends in your community. Social support is helpful!

In addition you may get information about local offers for recommended (not misleading) weight reduction programs which are designed to assist you on your way to a sustainable change of lifestyle.



# Get started



- The change of eating habits is a lifelong approach instead of short term diet.
- Identify the persons in your family and community who will support your plan.
- To reduce weight you need to eat fewer calories than your body needs for weight maintenance: 1,000 kcal (=10 portions of 100 kcal each) less per day are promising.

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- Increase your consumption of foods rich in water (vegetables)
- Decrease your intake of foods rich in fat.
- Eat primarily plant based foods.
- Replace high fat products with low fat products.
- Minimize your consumption of sugar and sugar sweetened foods and drinks.
- Limit your consumption of alcohol.
- Unfortunately, there is no magic drug or food which makes your fat tissue melt away.

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- Losing 3 to 5 kilograms of body fat per half a year is a great success.
- Set-backs are normal because we are human beings (not robots) and you need a well paned coping strategy for seductive and special dietary moments/situations.
- Define your limits for your best liked high calorie foods (e.g.: only 1 bar of chocolate per wk)

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These messages for a dietary intervention are capable to support weight reduction and subsequently have a positive impact on type 2-diabetes therapy. Additionally, the preference of "healthy" fats and the restriction of salt consumption have a beneficial influence upon other diseases which are frequently seen in diabetes patients, such as hyperlipidemia and hypertension.



## SECTION FOR NORMAL WEIGHT PERSONS WITH TYPE 2-DIABETES

Normal weight persons with type 2-diabetes should not reduce weight, because the action of the little self-produced insulin cannot be improved by a lower weight or even underweight [question 9]. These patients should know the carbohydrate containing foods which make the blood sugar rise.

- Bread and bakery products
- Rice, pasta, potatoes, corn
- Fruit
- Milk, yogurt
- Sugar, sugar-sweetened foods and drinks

These foods should be distributed in smaller portions over the day, preferably sparsely processed. "Sparsely processed" means whole grain instead of ground, entire fruit instead of juice, raw instead of cooked. This may result in a relatively lower rise of blood sugar after the meal. Minimize the consumption of sugar, sugar-sweetened foods and especially sugar-sweetened soft drinks. Sugar may be replaced by artificial sweeteners.

If dietary intervention alone does not achieve the goals of diabetes therapy, treatment with oral hypoglycaemic drugs or insulin is indicated.

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## SECTION FOR PERSONS WITH TYPE 2-DIABETES WHO INJECT INSULIN

Persons with type 2-diabetes who inject insulin should be able:

- to identify carbohydrate containing foods (see section above) and
- estimate the carbohydrate content of the snack or meal eaten.

The consumed carbohydrate content has to be matched with the adequate dosage of the injected insulin [question 10], always individualized, taking into account the characteristics of the individual insulin substitution strategy.



Here is a quiz that will help you clarify your knowledge regarding physical activity in the treatment of type 2-diabetes. We advise you to answer the following questions by ticking the right answer, before and after having read the chapter. You can find, however, the right answers within the text.

**1. Physical activity is a primary means of treatment within the therapy of type 2-diabetes.**

- a. True
- b. False

**2. In order to increase your physical activity, it is necessary to practice vigorous-intensity sports.**

- a. True
- b. False

**3. In order to start light physical activity (such as walking), it is necessary to wear a training tracksuit and sports shoes.**

- a. True
- b. False

**4. In order to practice physical activity, it is crucial to wear robust flat sole shoes which fit well.**

- a. True
- b. False

**5. It is beneficial for your diabetes control if you manage to implement additional 10 to 15 minutes (1,000 steps) of walking in your everyday life.**

- a. True
- b. False

**6. It is beneficial for your health to break up long periods of sitting as often as possible.**

- a. True
- b. False

**7. How much time do you need to go for a leisurely walk after having eaten a pizza in order to burn all the calories ingested?**

- a. ½ hour
- b. 1 hour
- c. 2 hours
- d. 3-4 hours

**8. Physical activity is mainly an obligation, not fun.**

- a. True
- b. False

**9. In persons with diabetes who inject insulin, physical activity may result in hypoglycaemia.**

- a. True
- b. False

**10. In persons with diabetes who take certain oral hypoglycaemic agents (sulfonylureas or glinides), physical activity may result in hypoglycaemia.**

- a. True
- b. False



SECTION FOR  
OVERWEIGHT PERSONS  
WITH TYPE 2-DIABETES

The level of physical activity is remarkably linked to type 2-diabetes. First of all, overweight – as a result of scarce physical activity combined with abundant eating – causes the manifestation of the disease and weight reduction is the first therapeutic measure to be taken in overweight persons with diabetes mellitus.

In the past the majority of weight reduction interventions focussed on the dietary part, restricting the ingestion of calories. By now we know about the crucial role of physical activity as an important component of such interventions. Energy restriction without physical activity has a negative influence on fitness, muscular strength, and generates loss of muscle mass.

Health care team members should recommend exercise training as part of a lifestyle modification for obese people with a focus on improving physical fitness (cardiorespiratory function and lean mass/ muscles) rather than merely creating greater energy deficits for weight loss.

*Persons with diabetes who inject insulin should contact their physician before increasing their physical activity, because they have to meet certain preconditions. Comorbidities might limit physical activity as well and in case of acute foot lesions, walking has to be restricted.*

# From a sedentary inactive behaviour to *light-intensity* physical activity

In obese persons with type 2-diabetes weight reduction and more physical activity are the two primary pillars of treatment [question 1]. But physical activity does not necessarily mean sports. So don't step back because you may believe that you have to start playing football or tennis or win a cross country run competition.

**Beneficial effects on weight reduction and diabetes control can be obtained by any movements which make the muscles work, such as gardening or going for a walk [question 2].**

Some people already enjoy regular physical activity and don't want to miss it anymore, because it increases their wellbeing and quality of life. But in industrialized countries a great number of citizens are in fact physically inactive. Escalators, cars and machines support our lives, but actually they support our convenience and laziness and prevent us from using our muscles.

If you lead a sedentary lifestyle, you can increase your level of physical activity just by the decision to walk more, preferably every day. Not possessing any sportswear is no reason to stay at home, comfortably sitting on your couch and watching TV. In order to start additional physical activity right away, you do not need a fancy training tracksuit and sports shoes [question 3].

**Please wear comfortable clothing and robust flat-sole shoes which fit well [question 4]!**

So they do not give rise to sore spots or blisters. This would not only be painful (as long as you do not suffer from diabetic polyneuropathy - then it's painless), but it would be detrimental to your feet and health as a person with diabetes (see the foot care chapter).





The numbers of steps we walk per day are a rough indicator for our physical activity level.

Persons with a sedentary inactive lifestyle have less than 2,000 steps per day,



whereas, for example,

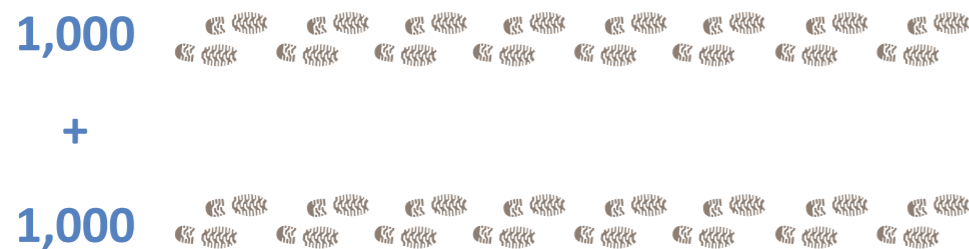
postmen can accumulate up to 20,000 steps per day.



If you decide to enhance your physical activity, you should increase it gradually. At the beginning, each day you may go for a walk of additional 1,000 daily steps. This will last about 10 to 15 minutes (or even a bit longer) and covers a distance of about 500 to 800 meters [question 5]. Initially this new activity needs some effort and you may consider it an unpleasant duty. But after a while most people start to like it, especially when accompanied by a partner or friend – or by their dog. The regular, preferably daily walk is most beneficial. But there are many reasons to stay at home and you need a coping plan. Please plan in advance what may be your strategy if it rains (→ take an umbrella), if it is hot (→choose the cooler evening hours) or if your comrade can't accompany you at a certain day.

Starting slowly (step by step) has several advantages: You avoid foot lesions, you do not overexert your body, nor your inner readiness and motivation.

After having implemented the first additional 1,000 daily steps in your everyday life you may go for the next level: further 1,000 steps. This means an investment of another 10 to 15 minutes walking covering over half an additional kilometre.



An analysis of several scientific studies suggests that substituting sedentary behavior with standing or light-intensity physical activity may reduce the risk of chronic disease and mortality. Furthermore, there are indications that even brief two-minute interruptions to sitting every 20 minutes lead to significant reductions in blood sugar levels. This fosters the recommendation to get up from your chair or couch frequently and go for a short walk around your office or department.

The recommendations for people with sedentary behavior are:

- Reduce the amount of time spent inactive (prolonged sitting)!
- Break up long periods of sitting as often as possible [question 6]!

Even for little money small devices are offered which measure how many steps you have walked during a day. They are called *pedometers* or *accelerometers* and can be attached to the belt. The more sophisticated types as well as specific smartphone applications have additional electronic functions (such as the distance walked or the amount of calories burnt). These may be interesting but they are not essential. The mere count of steps gives a good indication for your increase in physical activity.

Document the number of steps you walk per day on a piece of paper (as numbers or as a graph) and you can observe your development in physical activity. In case you are ready and feel good: go for another 1,000 daily steps and on certain days you may even obtain your personal magic goal of 5,000 or 7,000 or 10,000 steps.





# Moderate-intensity and vigorous-intensity physical activity

If you are about to go for moderate-intensity or even for vigorous-intensity physical activity, it is important to pass a sports-medical examination before getting started. Cardiovascular or bone diseases, infections or severe obesity may limit the level of physical activity. In patients with these problems, exceeding of certain intensity limits inverts the beneficial effects of physical activity and causes a negative impact on health. That's why you should count your pulse. Persons with diabetes who inject insulin should see the corresponding section of this chapter below, because hypoglycaemia may occur during physical activity.

If you have no contraindications for moderate-to-vigorous intensity physical activity, you may choose an activity or sports you like most.



For these types of endurance training, performed in moderate intensity (characterized by slightly increased breathing rate), several sessions per week, with a total of 150 minutes per week, are recommended. Performed at a vigorous-intensity level (characterized by markedly increased breathing rate and sweating) the recommended duration is at least 90 minutes per week.



There are quite a number of people who really get engaged in regular physical activity because they increasingly like it. In this case, the additional training of the major muscles (resistance training) has a further beneficial effect, because it supports your muscle mass maintenance. The training consists of different strength exercises (2 to 3 times per week) with fitness machines, resistance bands or just with the own body weight.

**These exercises should be instructed by experts. Keeping a physical activity diary might be helpful and supportive.**



# Does additional physical activity give the option to *eat more*?

Unfortunately, being physically active does not give you a licence for abundant eating, if you want to reduce your body weight successfully.

As a rough measure, a person with a body weight of 80 kg burns **per hour** about:



- 80 kilocalories (kcal) **lying and resting on the couch**
- 200 kcal **walking** (at a speed of 3 km/h)
- 250 kcal **walking** (at 4.5 km/h) or **swimming** (at 16 meters/min)
- 300 kcal **walking** (at 6 km/h) or **cycling** (at 9 km/h)
- 400 kcal **cycling** (at 15 km/h)
- 700 kcal **jogging** (at 9 km/h) or **cycling** (at 21 km/h)
- 1,000 kcal **running** (at 15 km/h)
- 7,000 kcal **running** (at marathon world record time)

In comparison you can see here how many calories the listed foods approximately deliver to your body:



So if you are hungry after a leisurely walk, do not believe that you need to eat an extra meal to compensate for seemingly higher calorie consumption during such a physical activity. In order to burn the calories ingested with one pizza you need to go for a walk for about 3 to 4 hours [question 7]. Only sports athletes have a need for calorie compensation after hours of tiring training and exercise.

Altogether, regularly performed physical activity has got beneficial effects on your physical and mental fitness, your cardiorespiratory function, your muscle mass, your diabetes control and your overall wellbeing, but – as the fly in the ointment – it is not appropriate to compensate for abundant eating.

## Get *ready*

The best way to prevent acute and long term complications of diabetes is your active participation in the treatment and if you can answer the following questions in a prevailing or totally **positive** way.

- **Is it important for my health and my quality of life to increase my physical activity?**
- **Am I ready to start the process of practicing more physical activity right now?**
- **Am I confident that I will achieve it and enjoy it at the same time?**

If you answered one or more of these questions in a doubtful or reluctant way, do not start with physical activity right away, but start to identify the circumstances and obstacles which make you hesitant. Physical activity should be perceived as delightful and rewarding – not as a duty and obligation [question 8].



**What should happen and what can you do in your life in order to feel positive about the implementation of regular physical activity in your everyday life.**

During this process of motivation for lifestyle change you are not alone! Ask members of your health care team or your health insurance company and people and friends in your community. Social support is helpful to implement a self-organized walking group (for example). In addition, you may get information about local offers for physical activity programs which are designed to assist you on your way to a successful and sustainable change of lifestyle.





# Get started



- Minimise the amount of time spent inactively (prolonged sitting)!



- Break up long periods of sitting as often as possible!

- Doing any physical activity is better than doing none. If you currently don't do any physical activity, start by doing some, and gradually build up to the recommended amount or up to your personal goal!



- Be active on most, preferably all, days of every week.

- As a person who injects insulin: Consult your physician before starting physical activity and learn about prevention, detection and treatment of hypoglycaemia!



- Consult your physician for a sports-medical examination before starting moderate-to-vigorous-intensity physical activity!



- If you have decided to practice moderate-to-vigorous-intensity physical activity: Accumulate at least 150 minutes (moderate) or 90 minutes (vigorous) per week!



M T W T F S S



- If you have decided to practice additional muscle strengthening activities: Do so on at least 2 days each week after being instructed by an expert in resistance training!



- Resume physical activities after temporary periods of inactivity (due to illness, journey, decline in motivation). Increasing your physical activity is a lifestyle change process which needs time to be established regularly in everyday life. Overcome obstacles using your coping plan, be prepared for common ups and downs in motivation, and reactivate your readiness remembering the delightful moments of physical activity already experienced!



## SECTION FOR PERSONS WITH TYPE 2-DIABETES WHO INJECT INSULIN

Persons with type 2-diabetes who inject insulin do not have to abstain from physical activity and sports. If you like to be physically active continue to do so, because it contributes to your quality of life and has got the beneficial effects on your health, as mentioned before in this chapter. But by injecting insulin you have to consider the blood glucose lowering effect of exercise and muscle work, which may result in hypoglycaemia [question 9].

Discuss the topic "physical activity" with your physician. Managing blood glucose self-control is essential before starting physical activity. Additionally, you must know how to prevent, how to detect and how to treat hypoglycaemic events (see the hypoglycaemia chapter).

Recommendations to prevent hypoglycaemia when performing physical activity:

- Check your blood glucose before, during and after physical activity!
- Carry glucose tablets with you in case of a hypoglycaemic event!
- In case of physical activity of short duration, you may need to eat additional carbohydrate containing foods!
- In case of physical activity of long duration, you may need to remarkably reduce your insulin dosage of that day!
- Refrain from physical activity with high BG-level above 250 mg/dl and ketonuria!



## ADDITIONAL SECTION FOR PERSONS WITH TYPE 2-DIABETES WHO TAKE SULFONYLUREA OR GLINIDE DRUGS

Persons with type 2-diabetes who take oral hypoglycaemic drugs of the sulfonylurea or glinide type have to consider that exercise and muscle work may result in hypoglycaemia [question 10]. See the hypoglycaemia chapter. Blood glucose self-control is essential before starting physical activity.

- Check your blood glucose before, during and after physical activity!
- Carry glucose tablets with you in case of a hypoglycaemic event!
- Refrain from physical activity with high BG-level above 250 mg/dl and ketonuria!



Here is a quiz that will help you clarify your knowledge regarding self-monitoring of blood glucose (SMBG). We advise you to answer the following questions by ticking the right answer, before and after having read the booklet. You can find, however, the correct answer within the text.

**1. It takes a lot of effort to perform SMBG.**

- a. True
- b. False

**2. Before performing SMBG I have to clean my fingertip with a special detergent.**

- a. True
- b. False

**3. I have to change the lancet of the pin-pricking device every week.**

- a. True
- b. False

**4. SMBG is useful:**  
(tick only one answer)

- a. At the initial diagnosis of diabetes
- b. For the assessment of glucose control during follow-up
- c. Only for my doctor

**5. I must measure my blood glucose:**  
(tick only one answer)

- a. Every morning, fasting
- b. Twice a day: in the morning and in the afternoon, regardless of meals
- c. 2-3 times a week
- d. Over 4 times a day, randomly
- e. At specific points in time, depending on my diabetes management schedule

**6. Regular and structured SMBG can be useful because:**  
(you may tick more than one answer)

- a. It provides information to my doctor
- b. It may prevent hypoglycaemia
- c. It may provide useful information for self-adjusting lifestyle and medications
- d. It may help to choose healthy food
- e. It may help to appreciate the beneficial effect of exercise on blood glucose



## What is SMBG?

SMBG is the procedure by which an individual performs self-measurements of his/her blood glucose during the day. Glucose meters are used for this purpose, which can instantly (in less than 10 seconds) detect blood glucose levels from the blood.



## How do I perform an SMBG?

During the last decade, advanced technology allowed for the procedure to become very simple. Blood from fingertips is used, after piercing the skin with a lancet, which can be placed into some special pin pricking device. Only a small drop of blood is enough for the measurement to be accomplished [Figure 1, question 1]. The blood is usually taken from the fingertips.



## Is it painful?

Pinpricking the fingertip may be irritating for some people, however, the majority do not consider it as a painful procedure. Try to pierce the side of the fingertip, where there are less nerves and the feeling could be less painful. If you find it difficult, your health care professional may have some tips and advice of how to use the device better. [Figure 2]

## Why should I do SMBG? [question 2]

### IF YOU RECEIVE INSULIN

If insulin is part of your diabetes regimen, SMBG is very important for two reasons:

1. It helps to find out and attain the right insulin dose [question 6].
2. It helps to detect hypoglycaemia [question 6].

- In case you receive only one injection of basal insulin at bedtime, blood glucose levels in the morning indicate whether your insulin dose suits your personal needs.
- In case you get prandial insulin injections (i.e. a rapid-acting insulin bolus before meals), measuring blood glucose before or/and after the meal (usually at 2-hours) will help you and your health care team to find the right insulin bolus dose.
- In case you receive premixed insulin, both fasting and postprandial (after meals) measurements will help you discover the right insulin dose.

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### IF INSULIN IS NOT PART OF YOUR DIABETES REGIMEN

In this case performing SMBG is not as mandatory as in the first case.

However, it can still be helpful, since:

- Blood glucose changes thousands of times during the day and often follows some repetitive patterns, which may differ a lot among individuals. For each person with diabetes, taking a look into his/her blood glucose pattern helps to reveal the “behavior” of his/her diabetes. For example, elevated blood glucose in the morning may indicate that your liver is producing a lot of glucose during the night, whereas too high blood glucose after meals indicates decreased insulin production during high demands. This might provide a clue to your health care team to choose the medications that tailor your needs.
- Self-involvement is mandatory for a successful diabetes management. SMBG can be a useful tool for acquiring important information for self-management. It can help to detect acute situations, such as hypoglycaemia or excessive hyperglycemia and react instantly. For example, a person with hypoglycaemia should avoid driving, even if he/she has no symptoms.
- SMBG may help persons with diabetes learn their glucose profile better than anyone else and thus provide feedback to their doctor and participate actively in their treatment. You can make your own observations concerning specific foods that elevate excessively your blood glucose, or note the impact of exercise [question 6].



## THE RIGHT PATTERN FOR SMBG

# At what *time* should I measure my blood glucose? [question 5]

*The pattern of SMBG performance is highly individualized. It depends on many parameters such as the type of treatment, the daily program, the personal preferences etc. Some general rules that may apply are the following:*

- Persons who are treated with multiple insulin injections should perform several measurements during the day, in order to adjust the units of insulin and avoid extremes of blood glucose.

- Individuals treated with antidiabetic agents other than insulin can be more sparing with their measurements. In this case it is important to suggest the most informative way to perform SMBG, which is the measurement of “pairs” of blood glucose. For example, pre-meal and post-meal (at two hours) blood glucose, for one big meal of the day can be measured. However, in case of insufficient glycemic control, or if the patient takes a lot of different types of agents, more measurements could be asked by the health care team.

- In the next page you can find an example of recorded measurements of blood glucose in pairs during different days.

*wrong!*

	pre breakfast	post breakfast	pre lunch	post lunch	pre supper	post supper	bedtime
Monday	X						
Tuesday	X						
Wednesday	X						
Thursday	X						
Friday	X						
Saturday	X						
Sunday	X						

*correct!*

	pre breakfast	post breakfast	pre lunch	post lunch	pre supper	post supper	bedtime
Monday	X	X					
Tuesday							
Wednesday			X	X			
Thursday							
Friday							
Saturday					X	X	
Sunday							

# Tips:

## The device

- Choose and buy your glucose meter after discussing with your health care team.
- Always keep the strips in room-temperature (~18-25°C).
- Read carefully the user manual and follow the manufacturer's care instructions.
- Be sure that the time-month-year is set correctly in your device.



## Performing SMBG

- Always wash your hands with soap before measuring. Then dry them well. You don't need to clean the skin with special detergents [question 2].
- Always repeat the measurement when your blood glucose is too high or too low. Repeat also in case of any unexpected result.
- Do not use pin-pricking devices from other patients.
- Change the lancet at least every 2-3 measurements [question 3].
- Do not use many glucose meters to compare the results. It is useless and stressful. If you suspect that your glucose meter does not work properly, refer to the manufacturer or your physician or pharmacist.



## Handling of the results

- Always try to interpret your results. Do not measure just because you have to.
- You can record your blood glucose values in a diary if you feel like or if that's what you have agreed with your doctor. Most devices keep your measurements in their memory. Most new devices include a software to download all the measured values in your PC or tablet.
- Always discuss the results of your SMBG with your doctor.



# Questions to my health care provider

- Should I perform SMBG?
- I perform SMBG regularly. Is this the right way to do it?
- Is it better to write down my glucose values or can you just check the memory of my device? Does my SMBG device work properly? Do I have to check it out?
- Is it OK to perform SMBG in my forearm? Should I adjust my medications according to SMBG results?

Write down and show any other questions regarding your SMBG issues to your health care team at your next visit.

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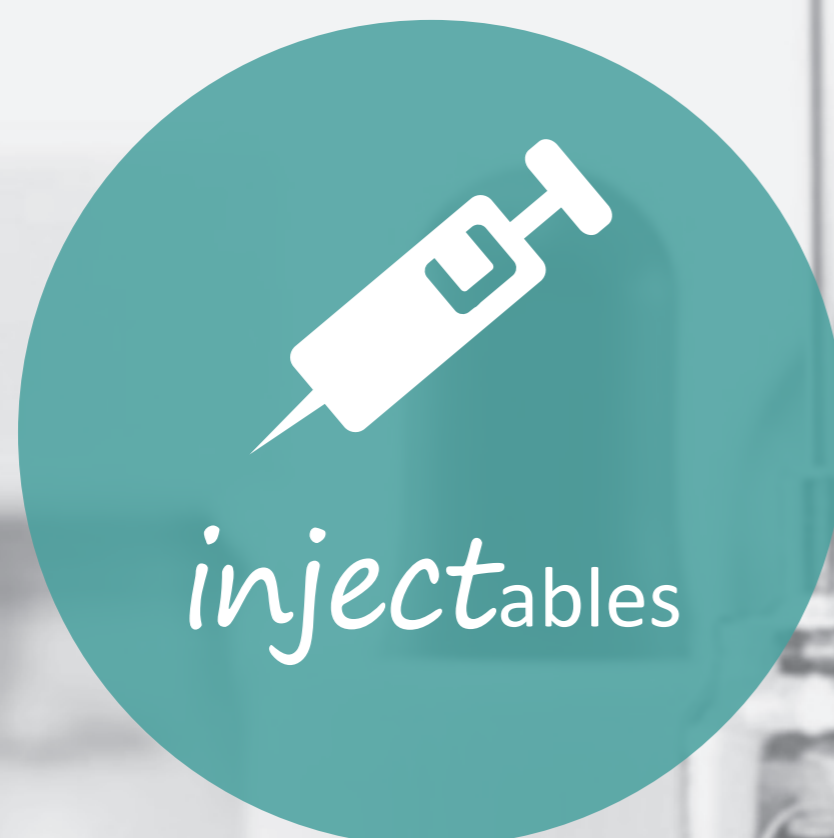
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Here is a quiz that will help you clarify your knowledge regarding antidiabetic medications and insulin. We advise you to answer the following questions, by ticking the right answer, before and after having read the booklet. You can find, however, the correct answer within the text.

**1. The introduction of injectable therapy for type 2-diabetes:**

- a. Relates to the natural development of diabetes/blood sugar levels
- b. Depends on the preferences of my doctor
- c. Can easily be substituted by oral medication

**2. After starting insulin therapy, I lose my independence to manage my condition.**

- a. True
- b. False

**3. Insulin can be administered through:**

- a. Tablets
- b. Syringes and Pens
- c. Drinking

**4. Insulin can be transported and stored at any temperature.**

- a. True
- b. False

**5. When fatty lumps (lipohypertrophy) appear under the skin:**

- a. It is inevitable, I can't do nothing
- b. It is a sign that I should change injection site more often
- c. It is a sign that the doctor should prescribe a different insulin

**6. The effect of insulin may depend on injection technique and timing of injection.**

- a. True
- b. False

**7. Insulin therapy allows me to begin eating whatever I want, without further preoccupation.**

- a. True
- b. False



# Insulin is another *tool* to help you achieve your goals

During the development of diabetes, your pancreas starts to lose the ability to produce the amount of insulin you need to maintain regular blood sugar levels.

Oral medications are able to promote insulin production or make the insulin produced be more effective. But sometimes they alone might not be sufficient to maintain the control of your blood sugar. In some situations, giving external insulin is the best way to avoid long-term complications and maintain quality of life [question 1].

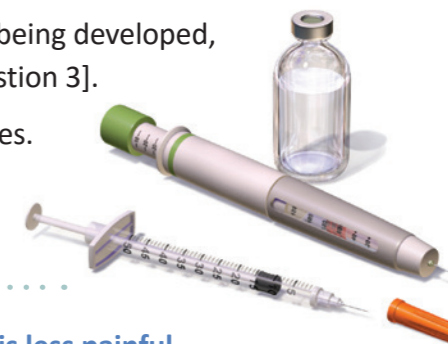
Your health care team will work with you to determine if insulin is an adequate part of your treatment. The team will also tell you when to initiate insulin to help you achieve your blood sugar goals and to prevent diabetes complications.

Starting insulin therapy does not mean that you lose your independence in managing your condition [question 2].

# How should I *deal* with insulin?

While alternate forms of insulin applications are being developed, at present insulin is given in injectable form [question 3].

Pens and syringes have very small and thin needles. Pens enable you to give more accurate doses, and are discrete to use even in public.

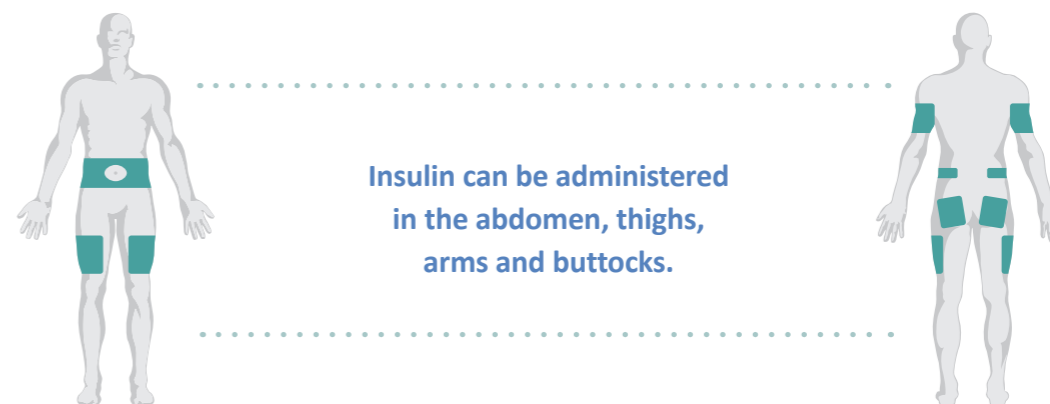


**Most people say that the injection is less painful than the finger pinprick that you do to test blood sugar. Ask your health care team to discuss both issues with you!**

There are different kinds of insulin and possibilities of insulin injection schedules, which make it easier to adapt the choice to your daily lifestyle and needs, minimizing the risks of hypoglycaemia.

After the first use, the vial of insulin must be used within 1 month. It should also not be exposed to direct sunlight, stored above 28°C or frozen [question 4].

The rotation of the injection site allows each particular site to recover between uses, and prevents the formation of fatty lumps under the skin [question 5]. To keep track of injections, try using the same general area at the same time of day, each day.



**Insulin can be administered in the abdomen, thighs, arms and buttocks.**

Insulin therapy can eventually lead to weight gain, which is preventable with meal planning and with maintaining yourself physically active.

Learn how your body reacts to insulin, especially in times of meals or exercise, and learn to time the injections for greater benefit and to avoid hypoglycaemia [question 6].



# Insulin therapy is *adaptable* to my lifestyle

Adjusting insulin dosing is a learning process.

Each person learns how their body reacts. An increase of carbohydrates in meals can require compensating with a rapid-acting insulin [question 7]. In some exercise activities, insulin dosing may need to be reduced.

.....  
*You can discuss your lifestyle with your health care team, so insulin schemes and doses are adapted to your needs.*  
.....

# Incretins are *another* injectable medication to control blood sugar... and eventually help to lose weight

Incretins are hormones that can stimulate your body to produce more insulin, generally without risk of hypoglycaemia. They can be prescribed as a complement if initial oral medication does not reach the desired effects.

A possible advantage with incretins is that they are known to help obese people with diabetes lose weight.

.....  
*Incretins are administered with similar pens to insulin.*  
.....

# Discussing *my worries* about insulin therapy

- Do I feel comfortable with insulin injections?
- Am I capable of adjusting insulin dosing with my lifestyle?
- Does my control of glucose values prevent complications?

Write down and show any other questions regarding your injectable therapy to your health care team at your next visit.

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Here is a quiz that will help you clarify your knowledge regarding hypoglycaemia (low sugar levels). We advise you to answer the following questions by ticking the right answer, before and after having read the booklet. You can find, however, the correct answer within the text.

**1. If I don't take insulin injections, I will never have hypoglycaemia.**

- a. True
- b. False

**2. If I use insulin, it is impossible to minimize the risk of having episodes of hypoglycaemia.**

- a. True
- b. False

**3. If my blood glucose level value is 90 mg/dl, it is hypoglycaemia.**

- a. True
- b. False

**4. Which of the following may be a symptom of hypoglycaemia? (you may tick more than one answer)**

- a. Weight loss
- b. Fast heart beating
- c. Thirst
- d. Tremor
- e. Shortness of breath when walking
- f. Weakness
- g. Hunger

**5. How long does it take for symptoms of hypoglycaemia to develop?**

- a. Seconds
- b. A few minutes
- c. A few hours

**6. In people using insulin or antidiabetic drugs predisposing to hypoglycaemia, which of the following is likely to cause a hypoglycaemic episode? (you may tick more than one answer).**

- a. More than usual physical activity
- b. Missing a meal
- c. Not having 4-5 snacks per day
- d. Alcohol without food
- e. A very low-carb meal
- f. Fasting for more than 6-8 hours
- g. Decreased kidney function

**7. Which of the following is the best option to treat a hypoglycaemic episode?**

- a. Chocolate
- b. A "diet" soft drink
- c. Sugar-containing drink
- d. A slice of bread with butter or cheese

**8. After treatment, how quickly does one need to recheck one's blood glucose?**

- a. Right after treatment
- b. After 15 minutes
- c. When the symptoms disappear
- d. After 2 hours

# Will every person with diabetes experience hypoglycaemia?

The answer is no. Low blood glucose can be a consequence of diabetes management. People treated with **insulin injections** are the most concerned about hypoglycaemia, as well as people treated with certain oral antidiabetic drugs, called **sulfonylureas and glinides**. Some drugs of these classes are **glimepiride, glyburide (or glibenclamide), gliclazide, glipizide, nateglinide and repaglinide** (they are available in the market with different brand names – look for the pharmaceutical name under the brand name in the box). People who use these medications should be always aware about hypoglycaemia and discuss with their health care provider how to avoid it, as well as how to treat it.

For people who do not use insulin or sulfonylureas/glinides, hypoglycaemia is very rarely a concern [question 1].

# What is hypoglycaemia?

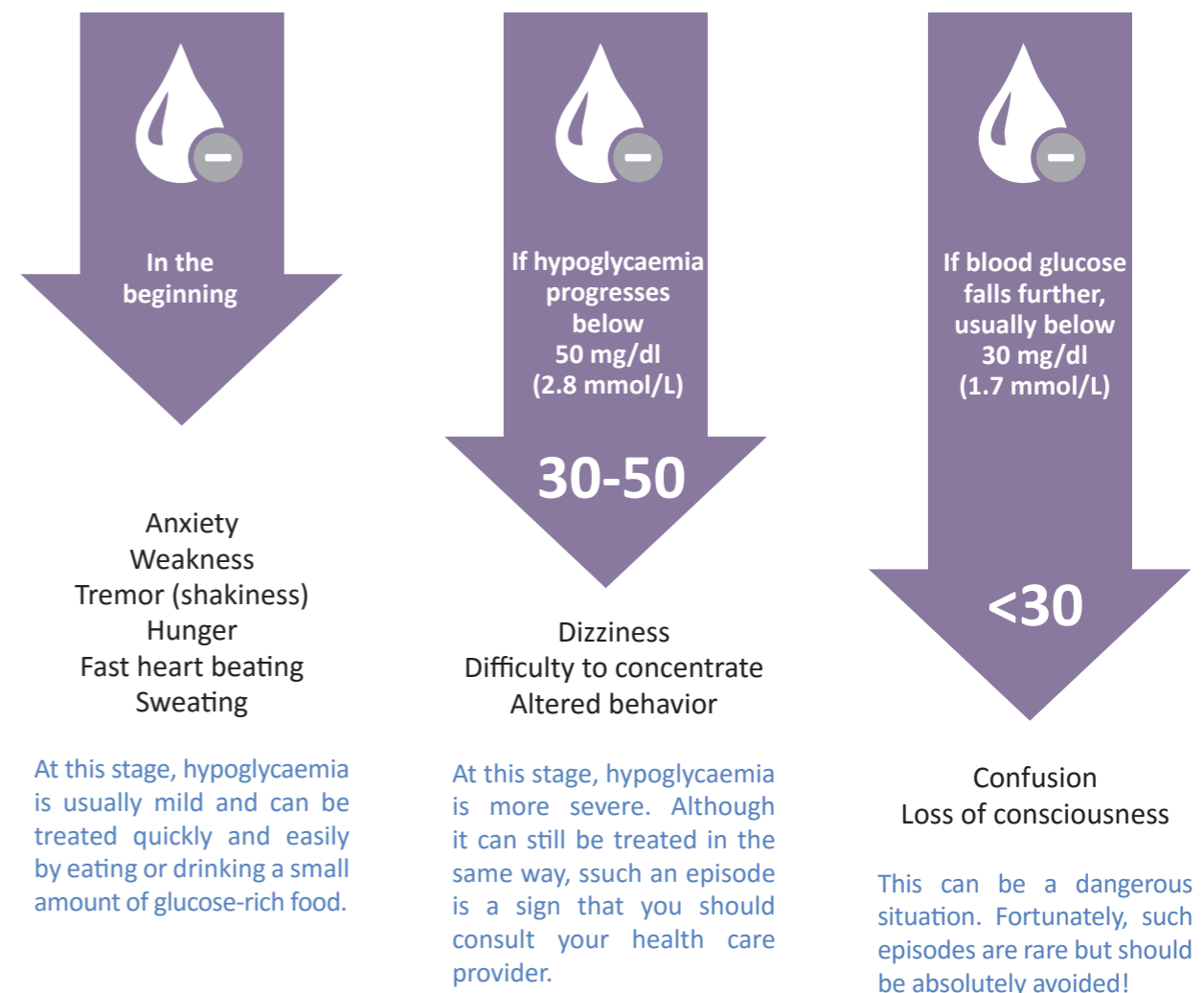
Glucose is an important source of energy for the body. Hence, its concentration is necessary to be maintained above certain limits. Hypoglycaemia is a situation when the blood glucose levels are below normal. It is widely agreed that the lower level of normal blood glucose is 70 mg/dl (3.9 mmol/L) [question 3], thus any measurement below this value, is considered to be a hypoglycemic episode.

The lower level of normal blood glucose is 70 mg/dl

# What happens then?

When blood glucose levels are getting lower and lower, the body gets stressed. In order to react to this situation, specific hormones are produced (namely, glucagon, adrenaline, growth hormone and cortisol), that can balance to some extent the fall of glucose. At the same time, the individual manifests **symptoms coming from the nervous system**, which tries to respond to the stressful event; and **from the brain (usually when blood glucose falls below 50 mg/dl (2.8 mmol/L))**, which lacks energy.

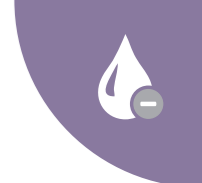
It is commonly accepted that every individual has his/her unique way of experiencing a hypoglycemic episode. However, there are some very common symptoms that everyone has to know, in order to distinguish an upcoming hypoglycemic event. Such symptoms are [question 4]:



# I use insulin or sulfonylurea. What can I do to *prevent* hypoglycaemia?

People using insulin and/or oral antidiabetic drugs (sulfonylurea or glinides) predisposing to hypoglycaemia, may follow certain simple rules to avoid it from happening. Following these rules should minimize the chance of having hypoglycaemic episodes [question 2].

- *If you use rapid acting insulin, never delay your meal after an injection.*
- *Discuss with your doctor the possibility to adjust your insulin dose according to your meal.*
- *Eat regular meals. A dietician can help you create a meal plan that meets your medical needs and includes the foods you like.*
- *Avoid fasting for more than 4-6 hours, especially if you receive pre-mixed insulin or sulfonylurea.*
- *Use alcohol with caution, as it can cause hypoglycaemia, especially when you drink on an empty stomach.*
- *Exercise may cause a reduction of your blood glucose levels. Have a small snack (such as a fruit, some toast or a cup of yogurt) before doing exercise (such as walking, swimming, bicycling or working in the garden for more than 30 minutes).*
- *If you wish to start exercising regularly, discuss this issue with your health care team. It may be wise, in the beginning, to measure your blood glucose before and after physical activity.*
- *Sometimes, hypoglycaemia can be a sign of impaired kidney function. If unexplained hypoglycaemic episodes start happening, discuss this issue with your doctor. [question 6]*



# I *think* I have hypoglycaemia What to do?

If you are not sure whether this is hypoglycaemia and you have quick access to a glucose meter, it is wise to measure your blood glucose first. If you don't have access to a glucose meter, it is better that you treat your symptoms as if you have hypoglycaemia.

Take 15-20 grams of simple (fast-acting) carbohydrates.

This is equivalent to [question 7]:

- 3 glucose tablets (the special ones for people with diabetes)
- 3 tea spoons of sugar or honey
- 1/2 can of sugary drink (e.g. Coke or Pepsi) or sugary fruit juice.

Then:

- Re-measure your blood glucose after 15 minutes [question 8].
- If the blood glucose is still low, repeat the carbohydrate intake.
- If the blood glucose has been restored to normal, have a meal within one hour.
- If the next meal is going to be later, eat some slowly-absorbed carbs (such as bread or fruit or yogurt).

## The rule of 15 to treat hypoglycaemia

Take **15** grams of simple carbs

Recheck blood sugar in **15** minutes

If still <70, eat another **15** grams of simple carbs

Recheck in **15** minutes

# Common mistakes!

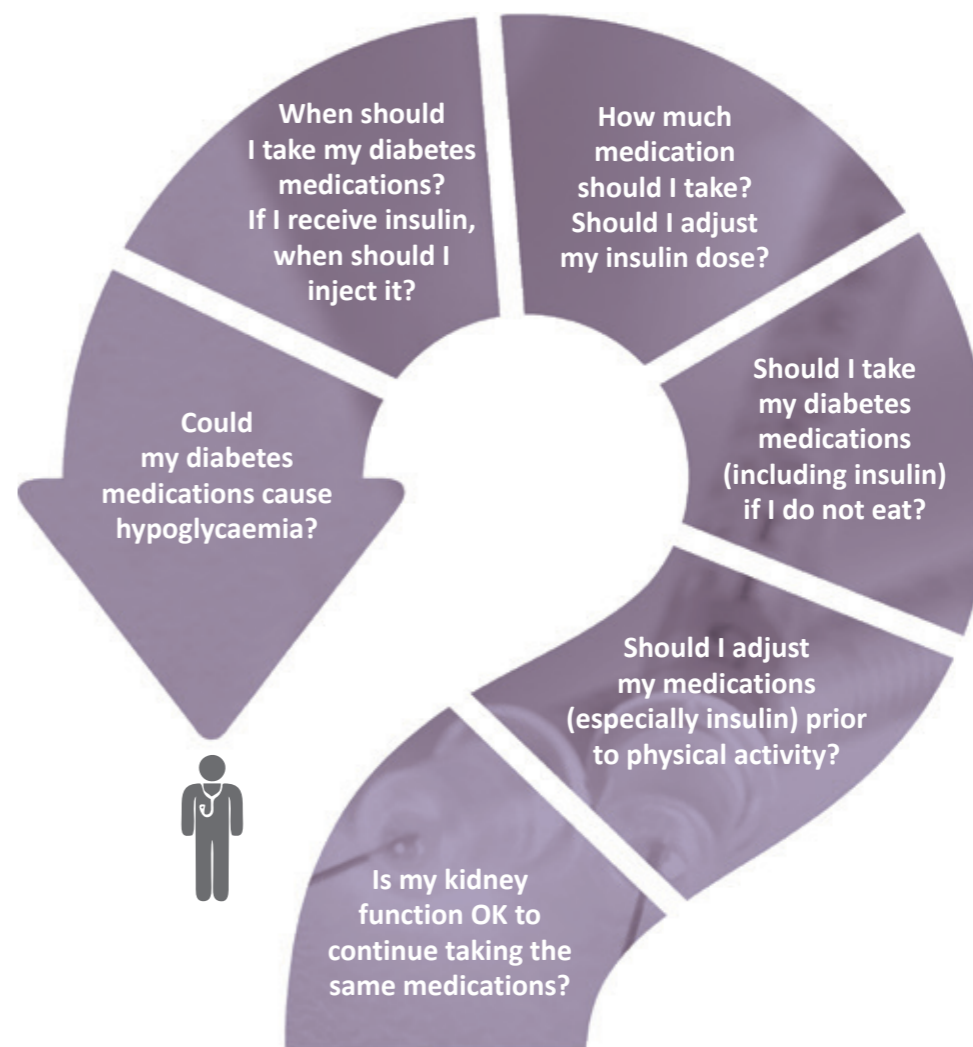
that may predispose to hypoglycaemia (if treated with insulin or sulfonylurea/glinide drugs):

- Skipping meals or having too small meals.
- Injecting too much insulin in order to prevent or correct hyperglycaemia.
- Starting intense exercise or exercising too much (more than usual).
- Drinking too much alcohol.
- Drinking alcohol on an empty stomach.

## When treating a hypoglycaemic episode

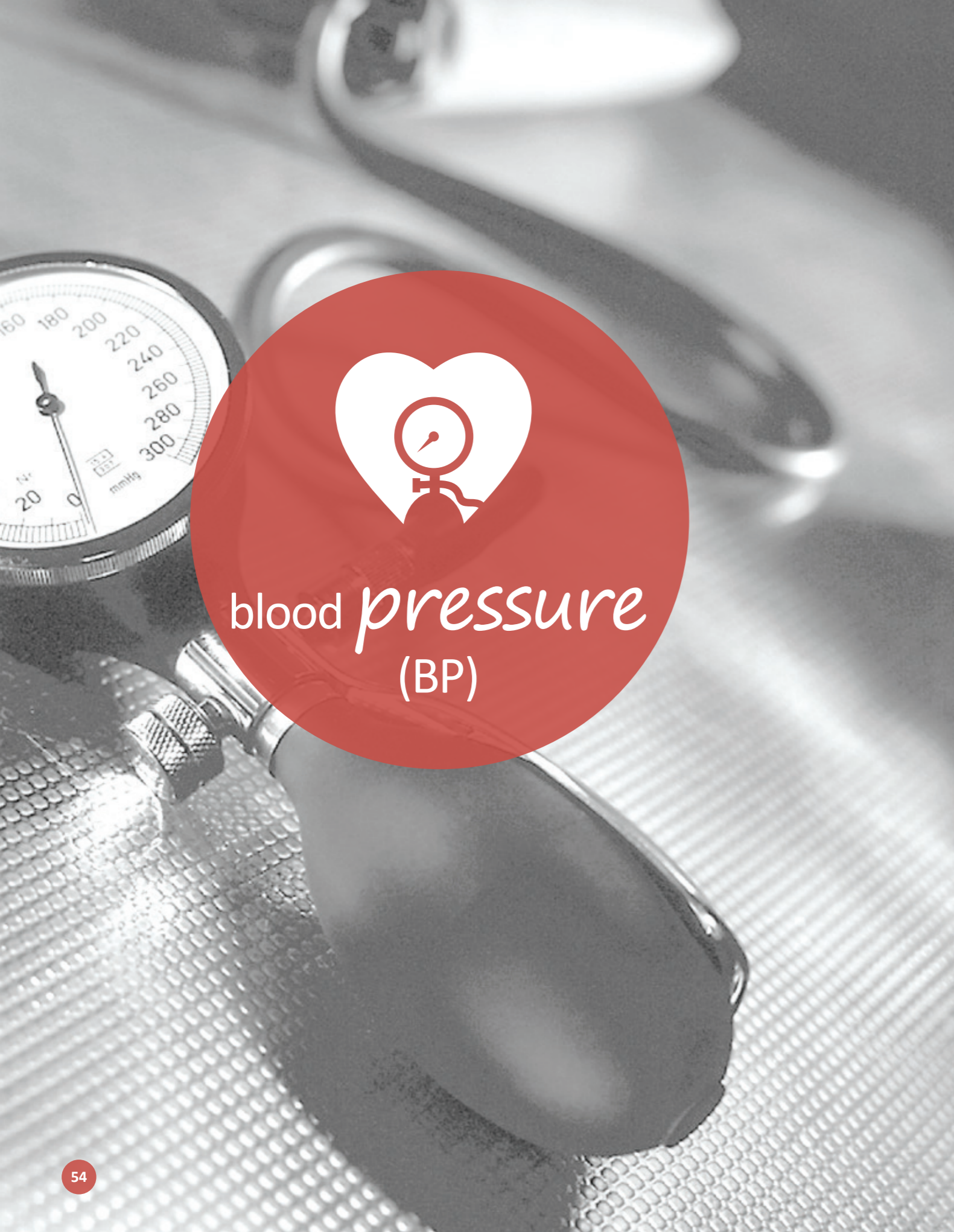
- Do not eat or drink sugar-free sweet products, especially sweetened beverages, as they will never restore blood glucose levels, since they do not contain carbohydrates.
- Do not eat chocolate, cakes or other high-fat sweet products, as they raise blood sugar slowly and will not be able to restore hypoglycaemia immediately, as needed. Hypoglycaemia should be restored promptly in order to avoid possible harms [question 7].
- Do not delay treatment, especially when busy. Hypoglycaemia is evolving quickly (into a few minutes) [question 5], making immediate action mandatory.
- Over-treating should be avoided. Don't go too far. A panic overdose of fruit juice with sugar, a box of chocolates or the entire contents of your refrigerator may lead to very high blood sugar and inability to achieve your goal of stable blood sugars.

# Questions to my health care provider during the next visit.



If you had a recent hypoglycaemic episode, ask the following questions:

- Did I have too little food?
- Did I take too much insulin?
- Did I take my diabetes medication without eating?
- Did I get too much physical activity without eating enough?



blood pressure  
(BP)

Here is a quiz that will help you clarify your knowledge regarding blood pressure (BP). We advise you to answer the following questions by ticking the right answer, before and after having read the booklet. You can find, however, the correct answer within the text.

1. High BP causes certain symptoms (headache, feeling hot, or feeling dizzy).
  - a. True
  - b. False
2. I should take my BP medicines only when my pressure is high.
  - a. True
  - b. False
3. I have high BP and my doctor checks it for me, so I don't need to check it at home, as well.
  - a. True
  - b. False
4. Only diastolic ("bottom number") BP is dangerous for my health, not systolic ("top number").
  - a. True
  - b. False
5. I measure my BP and I find it very high (>190/100 mmHg). I am at immediate risk of a stroke, so I need to decrease it immediately by taking extra pills.
  - a. True
  - b. False
6. When I get a nose bleed, it is because my BP is high.
  - a. True
  - b. False
7. Since I have high BP, I should try to decrease my salt intake, because extra salt in my food may increase my BP.
  - a. True
  - b. False
8. If you have hypertension, how often should you check your BP at home?
  - a. once a week
  - b. once a month
  - c. once a day
  - d. periodically, according to doctor's advice
9. When I find my BP high at home, what should the proper response be?
  - a. I should immediately take a sublingual pill
  - b. I should try to calm down and recheck it a while later
  - c. I should drink lemon juice
  - d. I should notify my physician to get advice
  - e. I should take a tranquilizer
10. Devices that measure BP at the wrist are OK to use.
  - a. True
  - b. False



## What is a *normal* BP reading and at what level does hypertension begin?

The **ideal BP** for all people is **below 120 over 80 (120/80) mmHg**. At this level, the risk of side effects is lowest. BP consistently **more than 140/90 mmHg** is considered high (**hypertension**). In the past, most attention was paid to the diastolic pressure (bottom number); however, nowadays we know that both systolic and diastolic pressures are important [question 4].

Some persons have a tendency to have higher BP levels when measured in the physician's office rather than at home (called "white coat hypertension").

## What are the *risks* of hypertension?

When BP is high, it damages the artery walls, promoting a build-up of fatty plaques. This can narrow arteries or strain and weaken their walls, leading to their rupture. Thus, persistent hypertension can lead to strokes, heart attacks, heart failure, arterial aneurysms, chronic renal failure and shortened life expectancy.

Contrary to what many people think, acute, transient elevations of BP, even at very high levels (i.e. >190/100), are not a real immediate threat for a stroke (question 5). An acute decrease of this high BP (sometimes with sublingual pills) can actually be dangerous and can itself lead to a stroke or acute renal failure. Thus, such an action is **not recommended**.

People should decrease their BP chronically and not transiently. If they find their BP high at home, they should try to calm down and recheck it in a while. Tranquilizers are not BP pills and should not be used for that reason. If the BP elevation persists, people should talk with their physician to reconsider their chronic BP treatment [question 9].

## How can you tell if you have high BP?

High BP is often referred to as the "silent killer", because there are usually no symptoms from it. The only way to find out if one has high BP is to get it checked.

It is a myth that people know when their BP is high, by feeling various symptoms, like dizziness, headache, heat, etc. Usually it is the unpleasant symptoms (headache, stressful situations, etc) that raise the BP, a phenomenon that is normal, tends to go away soon and does not need any treatment [question 1].

Nose bleeds are not caused by high BP either [question 6]. It is usually the anxiety that a nose bleed brings that raises the BP.

## How is BP measured?

BP is measured with a simple, painless test, using a blood pressure cuff. There are also automatic devices that measure it without the interference of another person. The inflatable cuff is wrapped around the upper arm. Some cuffs wrap around the forearm or wrist, but these are unreliable and should not be used [question 10].

People should decrease their BP chronically and not transiently





# What is the *proper* procedure for measuring BP?

*It is extremely important that a certain procedure is followed, otherwise readings are unreliable:*

- The room should be quiet, with a comfortable temperature.
- The person should have abstained from eating, drinking (except water), smoking, and heavy exercise for one hour before.
- He/she should have emptied their urinary bladder, as a full bladder affects BP.
- BP should always be measured on the right arm, if possible.
- Sleeves should be rolled up, so that the upper arm is bare. The remaining garments should not be constrictive, and the BP cuff should not be placed over any garment. The size of the cuff should fit properly on the arm. If the person's arm is too large for the cuff, the BP number may be falsely elevated.
- The participant should be sitting, and the arm and back are supported. His/her feet should be resting firmly on the floor. The arm should be resting on a desk, so that the upper arm is at the level of the heart.
- He/she must always feel relaxed and comfortable, and should not talk during the measurements.
- Two-three measurements should be taken, one minute apart, and the average of the last two is usually recorded [see log].

# Should I check my BP *at home* myself?

Because BP can fluctuate, monitoring BP at home helps the patient and the doctor track it more closely to determine if treatment is keeping it controlled, or if “white coat hypertension” is present [question 3]. It is important to take the readings at the same time each day, such as morning and evening, or as your health care professional recommends [question 8] [see table1].

## Home blood pressure monitoring

- We appreciate it is difficult but you should take blood pressure at least twice daily in the morning and evening.
- For each blood pressure recording, take two consecutive measurements, at least 1 minute apart and whilst you are seated.
- Do this for a minimum of 4 days, ideally for 7 days.

Name .....

Date of Birth/Patient Number .....

DATE		TIME	COMMENTS	HEART RATE (beats per minute)	BP READING #1 (mmHg)		BP READING #2 (mmHg)	
					systolic	diastolic	systolic	diastolic
	Day 1 Morning							
	Day 1 Evening							
	Day 2 Morning							
	Day 2 Evening							
	Day 3 Morning							
	Day 3 Evening							
	Day 4 Morning							
	Day 4 Evening							
	Day 5 Morning							
	Day 5 Evening							
	Day 6 Morning							
	Day 6 Evening							
	Day 7 Morning							
	Day 7 Evening							
	AVERAGE							

TABLE 1: Recording of BP at home



# Can something be done to control high BP *other than* medications?

Medications are extremely important to keep the BP under control. But there are also lifestyle habits that can keep it in a healthy range. Here are steps you can take to prevent or control it:

- **Keep your weight at a healthy level**, by a combination of healthy eating and regular exercise (at least 30 minutes of activity each day).
- **Eat a healthy diet**. Eat only the amount of food your body needs and choose foods high in nutrients and low in fat, sugar, and salt.
- **Limit how much salt you eat**. It may be salt that you add at the table or salt already added to processed foods you consume (e.g. canned food, etc) [question 7].
- **Limit how much alcohol you drink**.
- **Don't smoke tobacco**, and minimize your exposure to second-hand smoke.
- **Don't let stress build up**.



# How *often* should I take my BP pills?

Some people think they can take their BP medicines periodically, whenever they happen to find their BP high, or on alternate days or a few days in a week.

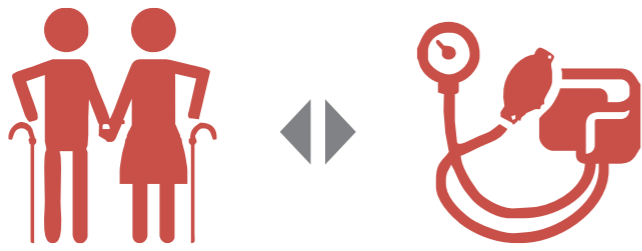
**This is absolutely wrong!**

People should use their BP medicines daily (as instructed by their physicians) [question 2]. No blood pressure medicine works for more than 24 hours.



**You should use your BP medicines daily!**





## Are there any specific problems with BP in *elderly* people?

There has been a faulty tendency not to treat elevated BP in the elderly, largely due to a common misconception that a normal systolic pressure is “100 plus your age.” Thus, based on this mistaken idea, a systolic BP of 170 in a 70-year-old person would wrongly be considered normal.

A potential problem in elderly people is that orthostatic (postural) hypotension (low BP) is found in some, causing symptoms of dizziness and faintness when they stand. As a result, supine and standing pressures should be measured in elderly patients prior to starting antihypertensive therapy, so that this condition could be diagnosed and treated.

## Discussing *my worries* about BP

- Do I feel happy with my BP control?
- Am I capable of measuring BP at home?
- Does my lifestyle affect my BP?

Write down and show any other questions regarding your BP issues to your health care team at your next visit.

A series of horizontal dotted lines provided for writing down questions or concerns.



foot care

Here is a quiz that will help you clarify your knowledge regarding foot care. We advise you to answer the following questions, by ticking the right answer, before and after having read the booklet. You can find, however, the correct answer within the text.

- 1. Foot ulcers can be preventable.**
  - a. True
  - b. False
- 2. How long does it take for a blister or an ulcer to be formed due to tight shoe wearing?**
  - a. If it is worn frequently and repetitively
  - b. After 10 minutes
  - c. After one hour
  - d. After 5-6 hours
- 3. Wide, large shoes help prevent foot ulceration.**
  - a. True
  - b. False
- 4. How often should you inspect your feet for rashes, blisters or change in color?**
  - a. Every day
  - b. When I feel something is wrong
  - c. Once a week
- 5. A large percentage of people with diabetes who have poor blood flow to their legs:**
  - a. Smoke
  - b. Have high blood pressure
  - c. Don't exercise
- 6. If you buy larger shoes than you usually wear and if you insert a special sole, you minimize the risk of foot ulcer.**
  - a. True
  - b. False
- 7. How should you care for your foot after a foot ulcer heals?**
  - a. Keep the healed area covered and bandaged
  - b. Continue to stay off your feet as much as possible
  - c. Wear therapeutic shoes
- 8. If you have diabetes the skin on your feet will likely be:**
  - a. Dry
  - b. Blistered
  - c. Moist
- 9. What should you do about a callus at the bottom of the foot?**
  - a. Wear normal wide shoes
  - b. Go barefoot
  - c. Wear shoes with soft insoles
  - d. Go to the podiatrist
- 10. The best time to apply lotion for dry skin is at bedtime.**
  - a. True
  - b. False
- 11. How can you treat calluses?**
  - a. By gently rubbing with a pumice every day
  - b. Use special pads which dissolve the calluses
  - c. By gently using a razor to get rid of extra skin.

# How can diabetes *affect* my feet?

Too much glucose, called sugar, in your blood from diabetes can cause nerve damage and poor blood flow, which can lead to serious foot problems.

- Poor blood flow means that not enough blood flows to your legs and feet through your blood vessels.
- Poor blood flow makes it difficult for a sore or an infection to heal. This is called peripheral artery disease. [Smoking is a major reason for peripheral artery disease](#) [question 5].

Another way how diabetes affects your feet is via nerve damage. Damaged nerves may stop sending signals, this can cause you to lose feeling in your feet.

- You may not feel heat, pain or cold in your legs and feet. You may have lost the protection provided by pain.
- [You may not feel that a poorly fitting shoe is causing you the formation of a blister, until it is too late.](#)

Sores on your feet can become infected, this is even more probable to happen if your diabetes is not well-controlled. Ulcers due to diabetes can and must be prevented [question 1].

Ulcers due to diabetes can and must be prevented



# Can diabetes change *the shape* of my feet?

## YES IT CAN!

You may have noticed yourself that during the years your feet have lost the fat pads of the toes or plantar surface. This is one of the reasons ulcers may develop at these areas since they are abnormally exposed to pressure during walking.

Look at this picture.

Now look at the plantar area of your foot.

Do you see any similarities?

If yes, how many?

.....



You might have to use a mirror

to see the plantar part of your feet.

.....



The shape of your toes might change. Diabetes can be the cause for the formation of hammertoes. [Because of hammertoes you may get sores on the top of your toes even after wearing ill fitted shoes, for a very short period of time, even after one hour](#) [question 2]. If these sores get infected then things become serious.

Don't trust your feet to warn you about the problem. As you have already read, loss of sensation is part of the problem of diabetic nerve damage of the foot. If you have calluses on the upper part of your toes, remember that this can cause you trouble.

This is what hammertoes look like.

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# Shoe fitting

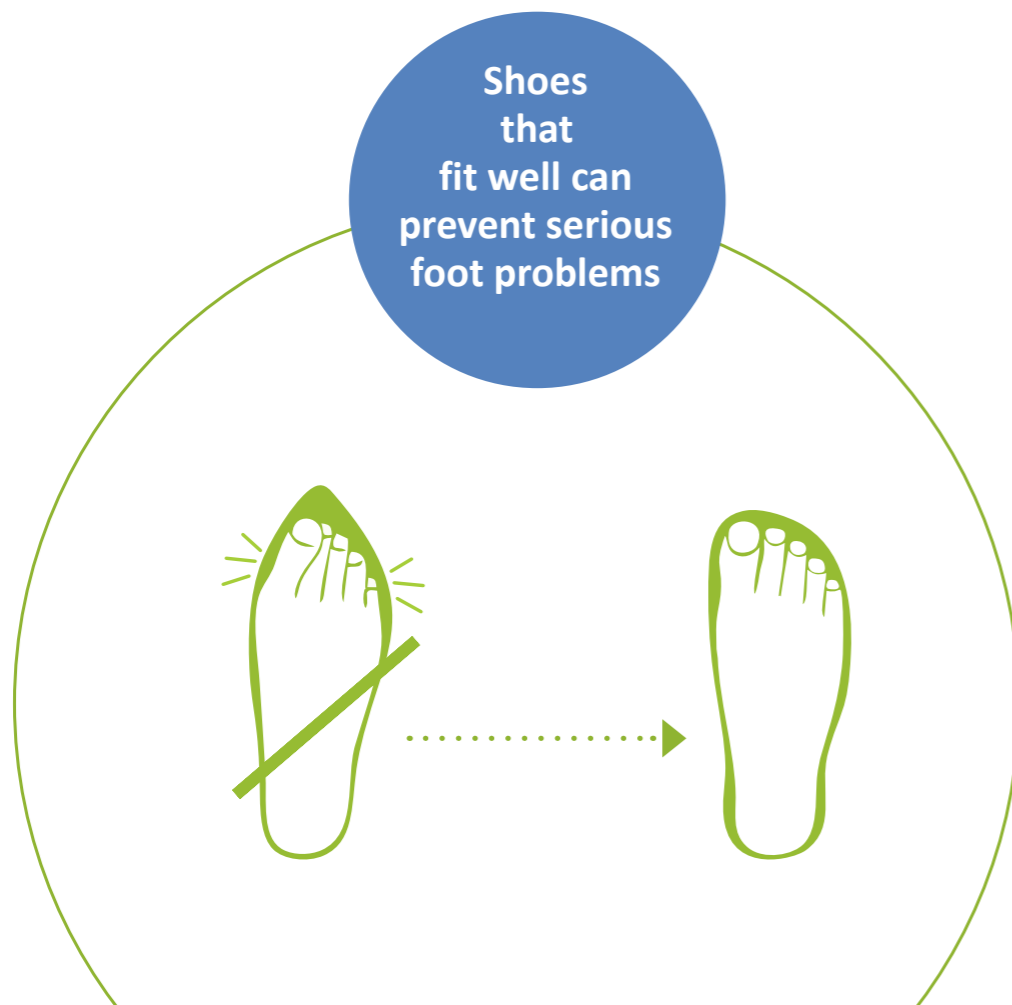
Correct shoe fitting is probably the most important element for the prevention of foot ulcers.

A simple way to see whether your foot has the appropriate space in the shoe you are actually wearing is the following:

- Stand up on a blank page of paper and draw the shape of your foot.
- Take your shoe and put it on the shape you have drawn. Does it fit?
- Is the shape on the paper larger than that of the shoe?

If this is the case, it means that this area of your foot is squeezed when you wear your shoes, even if you do not realize it [question 7]. Ulcers will be caused at these parts of your feet.

The shoe must be neither too small nor too large! [questions 3 & 6]



- Avoid open-toed shoes or sandals. Don't buy shoes with pointed toes or high heels. They put too much pressure on your toes.
- If you have calluses at the bottom of the foot, a specially made insole may prevent ulceration [question 9].
- Athletic shoes support your feet and allow air to move around inside the shoe.
- Never walk barefoot! Not even at home. Always wear shoes or slippers! You could step on something and get scratched or cut.
- Look and feel inside your shoes before putting them on to make sure there are no foreign objects!
- Avoid shoes that expose your toes or heels, such as open-toed shoes or sandals. These types of shoes increase your risk of injury and potential infections.
- Not only shoes, but also socks, if the wrong type, can cause trouble to your feet.
- Tight elastic bands reduce circulation, don't wear thick or bulky socks, they can fit poorly and irritate the skin.

## Do you know how to take care of your toenails?

Look at the following photos. Can you tell in which the toe nails are not cut correctly?



[Solution: The right picture shows toe nails which are not cut correctly.]

### Now examine your nails!

What do you think? Have you cut them in the correct way? What do you use in order to cut your toenails?

- Cut your toenails after bathing, when they are soft.
- Cut toenails straight across and smooth with a nail file.
- Avoid cutting into the corners of toes.
- Do not cut cuticles.



social networks



*Informal carers can help you monitor your health, interpret your monitoring values, and assure correct use of medication.*

In Patient Associations you can find support to help you manage your diabetes and detect complications early, as well as sharing experiences with people with the same difficulties and questions.

Find your support network, to assure your best health.



- Who supports your health concerns outside your health care team?
- Is he/she/they involved in your therapy?
- Does anyone besides your health care team review your registers/values?
- Do you know any Patient Association in your area?
- Do you know which services they provide?



# Associations and *support* services



## DIABETES UK

[www.diabetes.org.uk](http://www.diabetes.org.uk)

Description: It is the leading UK charity that cares for, connects with and campaigns on behalf of people affected by and at risk of diabetes. It is also the UK's largest charitable funder of diabetes research. Its main focus is:

- To provide information, advice and support to help people manage their diabetes.
- Their campaigns promote better diabetes care, and greater awareness of the key signs of both Type 1 and Type 2 diabetes.
- To promote healthy lifestyles and encourage people at high risk of Type 2 diabetes to seek early diagnosis and benefit from prompt treatment.
- Charitable funder of diabetes research.

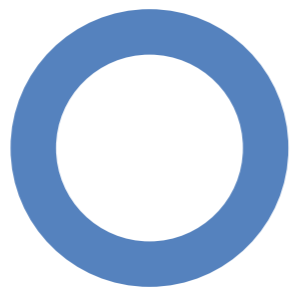


International  
Diabetes  
Federation

## IDF Europe

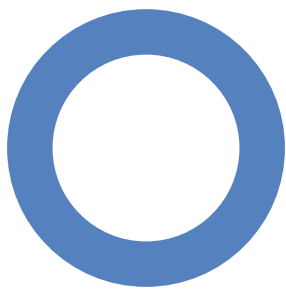
<http://www.idf.org/regions/europe>

Description: It is composed of 70 national Diabetes Associations in 47 countries across the European region, representing people living with diabetes and healthcare professionals. Its aim is to influence policy, increase public awareness, encourage health improvement and promote the exchange of best practice and high-quality information about diabetes throughout the European region.



MANAGE CARE STUDY GROUP





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