



ORION
PHARMA

Type 2 diabetes

Information and Support for Your Treatment



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TYPE 2 DIABETES HIGH CHOLESTEROL
HIGH BLOOD PRESSURE HEART FAILURE
ATRIAL FIBRILLATION CEREBROVASCULAR DISORDERS

www.orionsydan.fi – Comprehensive information package on heart health

See www.orionsydan.fi for wide ranging information on diabetes as well as great tips for lifestyle changes and treatment. You'll also find tests and printable material to support you in self care.

TYPE 2 DIABETES is a metabolic disease

It is estimated that there are more than 300,000 type 2 diabetes patients in Finland. In addition, 100,000 people have diabetes but are unaware of it. The disease most often develops at age over 35 and is strongly genetic.

Type 2 diabetes patient's blood sugar is elevated for long periods of time, which causes problems in different parts of the body. If untreated, diabetes can cause concomitant illnesses and shorten life.

We talk about insulin resistance when the cells' capacity to respond to insulin is weakened. The development of insulin resistance is affected, apart from genetics, by mid-body obesity, fat accumulation in inner organs, particularly in the liver, little exercise and diet rich in fat and sugar.

The diabetes patient's pancreas does not produce vital hormone insulin at all or it is produced in insufficient quantities. Therefore sugar (glucose) obtained with food is not transferred from the blood to the organs as it should. Thus blood sugar rises. Such type of diabetes is, for example, LADA (Latent Autoimmune Diabetes in Adults), which initially resembles type 2 diabetes.

Despite genetics, you can significantly influence the development of both insulin resistance and type 2 diabetes with your lifestyle.

400 000
Finns



EFFECTS OF TYPE 2 DIABETES IN YOUR BODY

Insulin and sugar are substances indispensable for human life but their imbalance may cause problems in different parts of the body.

Fatigue and Immune Response

When tissues are not capable of using sugar for fuel, the consequence is fatigue. Also the ability of the body to protect itself from pathogenic organisms weakens.



Depression

Type 2 diabetes may make you prone to depression. There are also indications that symptoms of depression, stress and bad quality of sleep can boost the development of insulin resistance and type 2 diabetes.



Nervous System, Kidneys and Eyes

Illnesses associated with diabetes develop gradually over years. As a consequence, the nervous system may be affected, which causes aches and pains, erectile disorders and the weakening of tactile sensation, vision and kidney function. The damage of the nervous system may also increase the risk of memory illnesses and in the worst case scenario lead to limb amputation.



Thirst and Urinary Frequency

High blood sugar causes the discharge of sugar into the urine, which increases the amount of urine and causes urinary frequency. Thus the body loses water and possibly also energy. As a consequence, the patient may experience thirst and weight loss.



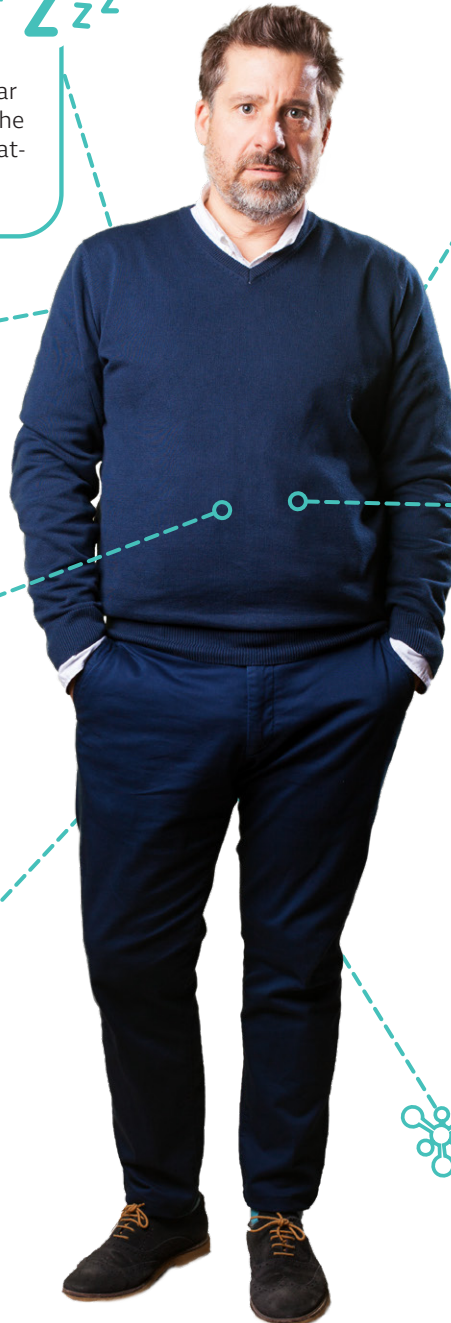
Atherosclerosis

The arteries of a type 2 diabetes patient become constricted easier than in other people. Moreover, the amount of certain blood coagulation factors is increased and platelets attach themselves more easily to the walls of the arteries. Therefore the body is not able to dissolve the clots normally. Thus the risk of myocardial infarction or stroke is normally elevated in a diabetes patient.



Blood Fat Values and High Blood Pressure

When diagnosed with type 2 diabetes, the patient often already has high blood pressure and/or fat metabolism disorder. The diabetes patient's risk to get atherosclerosis is clearly elevated, therefore lowering blood fat values and blood pressure is an important part of treatment.



80% OF TYPE 2 DIABETES PATIENTS HAVE METABOLIC SYNDROME

Metabolic syndrome (MS) is a multidimensional metabolic disease, in which the person accumulates several risk factors of cardiovascular diseases.

In addition to genetic factors, the onset of the syndrome may be boosted by lifestyles and excessive weight (particularly mid-body obesity). However, its development can be prevented by weight control

MS CRITERIA

You might have metabolic syndrome if you have one of the following:

- ☐ **Mid-body obesity** (waist circumference)



> 100 cm
(men)



> 90 cm
(women)

- ☐ **Increased triglyceride content** OR medication for it

≥ 1,7 mmol/l

- ☐ **Low HDL cholesterol** OR medication for it



< 1,0 mmol/l
(men)



< 1,3 mmol/l
(women)

- ☐ **High blood pressure** OR medication for it

≥ 130/≥ 85 mmHg

- ☐ **Sugar metabolism disorder** OR medication for it
Fasting blood sugar

≥ 5,6 mmol/l



Diabetes

TREATMENT OBJECTIVES

Diabetes is a lasting condition but with the right treatment you can live asymptomatic and well with it. Insufficient treatment can increase illnesses and increases the risk of premature death.

The important type 2 diabetes treatment objectives are the absence of symptoms and good quality of life. With good treatment, you can prevent concomitant diseases and atherosclerosis caused by diabetes.

TREATMENT OBJECTIVES ARE DEFINED INDIVIDUALLY FOR EACH PATIENT BUT THE TREATMENT ALSO PURSUES COMMON GOALS:

- In own measurements fasting blood sugar value < 7 mmol/l, two hours after a meal < 8–10 mmol/l
- The “sugaring” of red blood cells, HbA1c when taking medication < 53 mmol/mol (< 7%) depending on medication and duration of the disease
- LDL cholesterol (so-called bad cholesterol) < 2,5 mmol/l
- Blood pressure level < 140/80 mmHg
- Adding everyday activity and exercise (at least 30 minutes daily)
- Weight management (even 5% permanent weight loss makes a positive impact)
- No smoking
- Moderate alcohol consumption

You agree on your own goals together with your doctor and nurse.

Blood Sugar Monitoring

Normal target value in the morning and before a meal: < 7 mmol/L. Target value after a meal: < 10 mmol/L. HbA1c goal: normally < 53 mmol/mol (< 7%).

It is worth measuring your blood sugar yourself after you have been diagnosed with diabetes. Thus you can see how it is influenced by food, exercise, weight loss and medication. In the beginning monitoring is needed since changes in blood sugar are usually not felt.

Measurements are recorded in a separate monitoring diary or downloaded from the meter memory on a computer, mobile device or server.

It is generally enough for tablet treated diabetes patients to measure their blood sugar on one to three days a week. It is best to do so-called pair measurements, meaning that you measure your blood sugar before breakfast and the main meal of the day and two hours after these meals. Before a treatment visit it is recommended to do intensified monitoring on three days measuring blood sugar more often than normally.

When sugar balance is normalised and the HbA1c value remains at the target level, such routine blood sugar measurement is not needed unless you use medication that can cause low blood sugar or you are treated with insulin. Need for self-monitoring may be reassessed as lifestyle or medication changes.

Sugar that is attached to red blood cells, **sugar hemoglobin (HbA1c)**, reflects long-term sugar balance. It is taken every 6-12 months from a blood test in a laboratory or at a visit with an express meter. For a person with good treatment balance or early stage diabetics it may be enough to do tracking every 6-12 months. Other that that follow-up visits are setted individually.

Blood Pressure Measurement

Systolic blood pressure (upper pressure)

goal: < 140 mmHg

Diastolic blood pressure (lower pressure)

goal: < 80 mmHg

It is useful to get your own blood pressure meter. Meters are normally supplied with clear instructions.

As blood pressure varies at different measurements in the same person, it is measured twice within a few minutes on four different days. The average value is calculated from the results of these measurements.

In long-term monitoring such double measurement is done, for example, once a week or a few times a month and the results are recorded in the monitoring diary or on a blood pressure card, computer or mobile device. Efficient lowering of elevated blood pressure significantly reduces the risk of arterial diseases.



Fat Metabolism in a Diabetes Patient

In type 2 diabetes blood fat or triglyceride content (Trigly) is typically too high and "good" HDL cholesterol (HDLkol) is too low. The primary reason for it is insulin resistance. Total cholesterol (Kol) and LDL cholesterol (LDL-kol) are often almost normal.

TARGET VALUES

Total cholesterol (Kol)

< 5 mmol/l

LDL cholesterol

< 2,6 mmol/l (patients that have been diabetic for less than 10 years)

< 1,8 mmol/l (patients that have been diabetic for more than 10 years and if there are other risk factors)

< 1,4 mmol/l (diabetics with target-organ damage or other significant risks)

Triglyceride content (Trigly)

< 1,7 mmol/l

HDL cholesterol



>1,0 mmol/l
(men)



>1,2 mmol/l
(women)

LDL = Low Density Lipoprotein, HDL = High Density Lipoprotein

Treatment Visits and Things to be Monitored

Depending on diabetes treatment balance you meet your doctor or nurse at least twice a year to check blood sugar values and their possible abnormalities. At the visit you discuss your life situation as well as coping, diet, exercise, weight control and if relevant smoking and alcohol consumption. They also assess your heart health, examine your feet and if necessary determine injection places and technique.

The aim of the treatment visits is to assess the achievement of treatment goals that you have set together and to see if the treatment has been efficient or if it has to be intensified. Your wellbeing and coping are mapped at the visit.

Different lab tests such as liver values, blood fats and blood creatinine content and albumin tests reflecting kidney function are taken annually. Your blood pressure is also taken at the visit. Before the visit they examine your ECG. If necessary, tests are taken to assess thyroid function, the gout value and the amount of vitamins B12 and D.

You should also see a dentist once a year because inflammations in your mouth increase blood sugar and may cause more changes in your arteries.

Fundus images are taken or you are examined by an ophthalmologist individually according to the situation normally once in one to three years.



ENHANCE GOOD TREATMENT OF DIABETES with your choices and lifestyles

With healthy lifestyles you can remarkably reduce the harmful effects of diabetes on your body. Treatment of type 2 diabetes is started with diet and exercise, and with metformin medication if needed.

You can reduce or even avoid the need for medication by making your lifestyles healthier. This also lowers the risk of concomitant diseases. Start your self-treatment with everyday things that you can control: eating less and healthier, adding exercise and quitting smoking.

The earlier type 2 diabetes is diagnosed and lifestyle changes are initiated, the better are your chances to stay asymptomatic.



More Energy and Power for Your Life from Exercise

Regular exercise for endurance and muscle strength has many positive effects on type 2 diabetes. Exercise has a favourable effect on blood pressure, fat metabolism and sugar metabolism. It cheers you up, makes your muscles stronger and keeps up or improves your ability to get things done. Exercise also makes it easier to lose and control weight.

You should exercise at least 30 minutes a day.

At the beginning, if you are in a bad shape, you do not have to exercise for half an hour in a row. Even little exercise is good for you. When you get into a better shape, it is good to add exercise according to your strength. Make exercise part of your daily routine: clearing snow and walking to the store or up the stairs are choices you make on a day-to-day basis to treat diabetes.

You can also use a step meter and heart rate meter to support your exercise. Remember to flex and stretch sufficiently and to keep up the movement range of your joints and to relax.

You can get help to start exercise at your municipal exercise support service and in different sports groups

The exercise pie chart conveniently summarises the recommended exercise model. www.ukkinstituutti.fi



Eat Healthy

Diet generally recommended to diabetes patients follows healthy diet recommendations for the entire population.

In your diet you should watch the amount and quality of food as well as your meal schedule. The appropriate recommendation that would suit most people is three to five meals a day. Eating insufficiently during the day could easily lead to overeating in the evening.

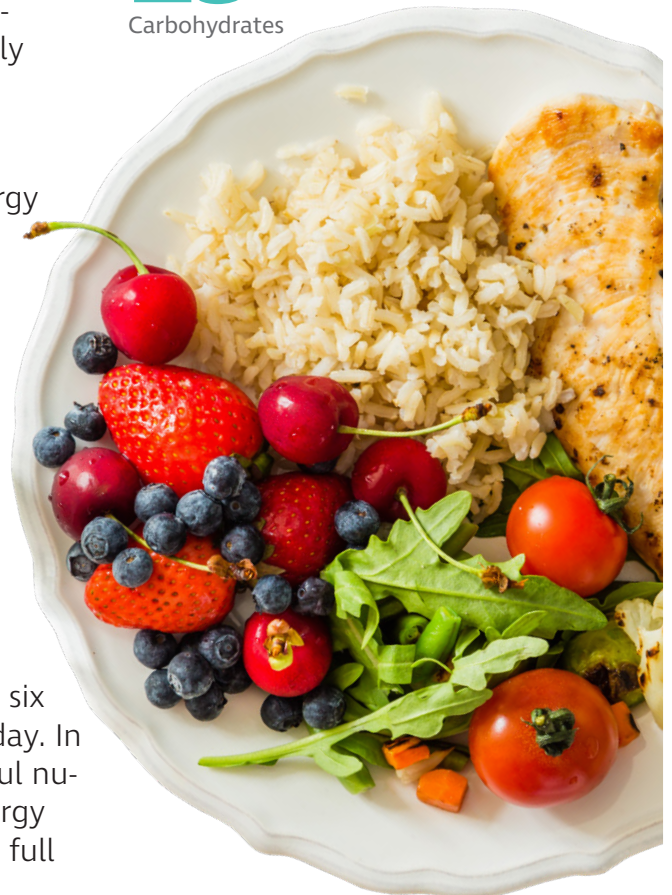
The diet should be aimed at getting as much energy from food as you spend or getting less energy than you spend if you are losing weight.

To assist your everyday diet, you can use the plate model where half the plate is filled with veggies, approximately one quarter consists of high quality carbohydrates and the other quarter is protein.

The plate model is supplemented with full grain foods and fat free dairy products. You should also eat around half a kilogram, or approximately six handfuls of vegetables of different colours every day. In addition to fibre, you get vitamins and other useful nutrients from vegetables. Vegetables lower the energy density of food, meaning that they make you feel full with fewer calories.

25 %
Carbohydrates

25 %
Proteins



50 %
Vegetables

CARBOHYDRATES

Eating carbohydrates rich in fibre keeps your blood sugar stable, makes you feel fuller, has a favourable effect on fat values and improves your insulin sensitivity.

Good sources of carbohydrates are vegetables, full grain bread and other grain foods, full grain rice, berries and fruit. Potatoes and pasta enjoyed in moderation are also good options. Carbohydrates that quickly raise blood sugar such as sugar, sweet drinks, white grain foods and snacks should be avoided. Sugar can be used in small amounts as sweetener.

PROTEINS

Good sources of proteins are low fat dairy products, fish, chicken, low fat cold cuts and eggs. Plant food dominated diet containing dairy products is an option if you do not want to eat meat. It is recommended that you get approximately one fifth of your daily energy from protein.

FATS

Always choose soft fat if possible. You can easily get hard fat as so-called hidden fat, e.g. from meat or ready-made meals.

The use of soft (unsaturated) fats has a favourable effect on insulin resistance and blood pressure. Soft fats include vegetable oils, fish fats and the majority of spreads and margarines that spread easily even fridge cold. Hard (unsaturated) fats are coconut, beef, milk and butter fat. Reducing their use lowers cholesterol.

SALT AND ALCOHOL

Reducing salt promotes cardiovascular health and in particular lowers blood pressure. You get used to low salt diet over time. Alcohol should be enjoyed in moderation, as it gives empty calories and can also raise blood pressure.

The heart sign on food means that you have chosen an alternative that promotes heart health and diabetes treatment.

Product information specifies the quantities of different nutrients.



Weight Control

Weight control is central to the treatment of type 2 diabetes. By stopping weight increase and losing weight you can significantly improve metabolism if it has been impaired.

Even a 5% weight loss in type 2 diabetes patients reduces liver fat and lowers blood sugar.

Furthermore, weight loss lowers blood pressure and fixes fat metabolism disorders. If you are not remarkably overweight, weight control might mean that you maintain your current weight.

Surgical treatment for obesity can be considered if despite serious attempts to lose weight your BMI is over 35 and blood sugar treatment goals cannot be achieved.

Body Mass Index (BMI) calculation formula:

$$\text{BMI} = \frac{\text{YOUR WEIGHT (kg)}}{\text{YOUR BODY LENGTH SQUARE (m x m)}}$$

Waist circumference target measurements:



< 100 cm
(men)



< 90 cm
(women)

Significance of Mental Wellbeing

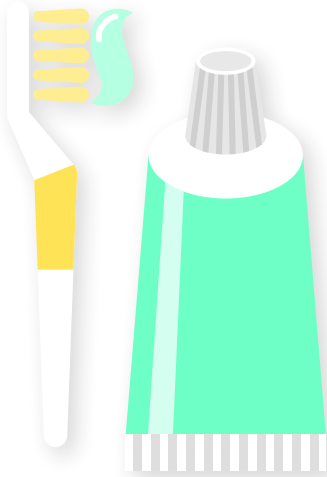
Feeling down, weight changes, tiredness and fatigue may be signs of constant high blood sugar but also of depression. Even mild depression might affect self-treatment of diabetes and treatment outcome.

Ups and downs are part of life but if you are under the weather a couple of weeks in a row, although your blood sugar balance is fine, it would be a good idea to bring this up with your nurse or doctor.



Do Not Smoke

Smoking may add kidney, nerve and fundus blood vessel damage and double the risk of lower limb amputation. Ask your nurse about a stop smoking support group. You can also use medication or nicotine products for your withdrawal symptoms.



Diabetes and Oral Health

By eating healthy and brushing your teeth carefully every day you can efficiently prevent inflammation in your mouth.

Diabetes makes you prone to both normal gingivitis and more severe periodontitis (inflammation of tissues around your teeth). Periodontitis and diabetes may enhance each other's progress because they both upkeep minor continuous inflammation in your body.

If your blood sugar values are constantly elevated, it would be a good idea to have the condition of your mouth checked. Gingivitis and periodontitis often develop unnoticed. It is important to see your dentist and oral hygienist at least once a year. Your dentist will recommend the appropriate check-up frequency.

Keep Your Feet in Order

Diabetes may weaken tactile sensation in your feet, which makes your feet more prone to injuries and inflammation. Good sugar balance is the best help for the wellbeing of your feet as too high blood sugar not only damages your nerves but also causes inflammation sensitivity.

Taking good care of the feet is particularly important for a diabetes patient.



Foot Care ABC

1. Wash your feet and check between the toes daily. Dry the skin carefully and apply cream if needed. Do not apply cream between the toes.



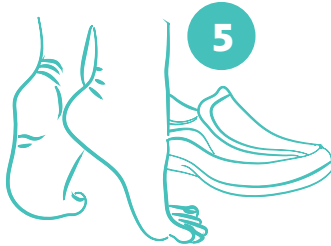
2. Cut your toenails straight to the shape of the head of your toe not losing the angles.

3. Treat possible skin damage, chafe and hardening carefully to avoid the development of more severe feet injuries.

4. Your shoes should be spacious enough, so they do not chafe or cause corns.



5. Wear new shoes at the beginning for a short time, so your feet get used to them.



6. Use sandals in public washing facilities due to inflammation sensitivity.



Contact your nurse...

- ☐ if you notice swelling or redness in your feet
- ☐ if you feel pain when walking
- ☐ if you get an open wound in your leg or foot
- ☐ if self-treatment does not help in a few days

Type 2 Diabetes and Travel



Diabetes patients can travel and experience things.

When you travel in your country and particularly abroad, food, exercise and daily routines may be different from what you have at home. This makes blood sugar monitoring particularly important.

Traveller's checklist

BEFORE YOUR TRIP

- ☐ Take with you valid prescriptions and get a certificate in English written by a doctor about your disease and treatment.
- ☐ Ask your nurse or doctor for instructions on what to do if you get an abdominal disease and how to use medication in the event of severe diarrhoea.

WHEN YOU PACK

- ☐ Pack blood sugar measurement equipment and all required medication in original packaging in your hand luggage.
- ☐ Pack comfortable good shoes that you already wear. New shoes may easily chafe and hurt, which can cause inflammation in your sensitive feet.
- ☐ Take your diabetes sign and I Have Diabetes card with you.

IF YOU USE INSULIN

- ☐ During your trip your blood sugar can be slightly higher than normal.
- ☐ Carry with you glucose tablets or sugary juice tetras that raise your blood sugar fast.
- ☐ Tell your fellow travellers about your illness. Tell them that the symptoms of too low blood sugar can resemble drunkenness. Instruct them to give you food and/or drink containing sugar if needed.
- ☐ Storage cases sold by the Finnish Diabetes Association and pharmacies further the preservation of insulin in different temperatures.
- ☐ It is worth talking to your nurse or doctor about possible dosage changes before your trip.

THE GOAL is to prevent concomitant diseases

Diabetes is a lifelong disease that increases the risk of getting other severe conditions. You should treat your diabetes carefully and follow the treatment plan agreed upon with your doctor and nurse.

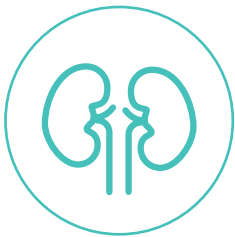
Diabetes Affects Your Entire Body

Most type 2 diabetes patients have metabolic syndrome and too high blood pressure as well as blood fat metabolism disorder. The efficient treatment of elevated blood pressure and cholesterol lowers the risk of ischaemic disease, brain circulation disorders as well as kidney and fundus changes.



Cardiovascular Diseases

Type 2 diabetes patients' arteries constrict more easily than normally. Diabetes multiplies the risk of ischaemic disease, myocardial infarction and circulation disorders in your feet and brain. At the annual visit you will be asked how you tolerate load, your ECG will be taken and you will be sent to a load test. You will see a cardiologist who will examine you and assess possible treatment if needed.



Kidney Damage or Diabetic Nephropathy

Renal corpuscles that filter your blood and eliminate waste from your body become damaged if your blood sugar and blood pressure are too high. Kidney function is examined using your annual blood and urine tests. A small amount of protein in your urine (microalbuminuria) is an early sign of kidney overload. If you keep your blood sugar and blood pressure under control the condition is reversible. More permanent changes may develop over time, and along with protein discharge the filtering capacity of the renal corpuscles may weaken and you may develop kidney failure. You will be sent to an urologist for examination and treatment assessment if necessary.



Nerve Damage or Diabetic Neuropathy

If your nerves are strained due to high blood sugar you can feel it first in your legs and feet. Numbing in your legs, tingling sensation or increased sensitivity in your feet, muscle cramps and restless legs can all be signs of too high blood sugar. The symptoms can be alleviated by adjusting blood sugar but more persistent changes may develop overtime and tactile sensation in your legs and feet may weaken, which makes you prone to getting wounds and ulcers.

Tactile sensation and circulation in your legs and feet are examined at the annual visit to determine their risk class. You will be sent to a podiatrist for examination and treatment assessment if necessary.

High sugar content in your inner organs may increase sweating, cause dizziness, slow down intestinal function and enhance the development of erectile disorder.



Retinal Damage or Diabetic Retinopathy

The capillaries of the retina of your eye become strained due to high blood sugar and blood pressure. Point haemorrhages and fat leaks can be seen in the fundus images. If the damage develops further, capillary clogging can be observed. The disease may lead to more permanent weakening of the eyesight.

Fundus imaging or an ophthalmologist's examination are done individually according to your situation normally once in one to three years. If more severe changes are seen in the pictures, the ophthalmologist can give you injections or laser treatment.

Help in Treatment Monitoring

Active and goal-oriented treatment is worth the effort because good results can be achieved even by small daily changes aimed at promoting health.

Successful type 2 diabetes treatment is based on self-treatment and monitoring your situation. Pay attention to how you feel and ask your nurse or doctor for guidance and instructions if needed.

Good Treatment is an Investment in the Future.

You can use different aids to monitor your treatment such as the monitoring diary developed for type 2 diabetes patients. Ask your nurse about the diary. In addition, it is recommended to acquire your own blood sugar meter and blood pressure meter. Talk to your nurse and doctor about it and your nurse will help you if needed.

Good sources of information on lifestyle changes and diabetes treatment are:

www.orionsydan.fi, www.diabetes.fi/en,
www.pienipaatospaivassa.fi,
www.ukkinstituutti.fi/en,
www.suomimies.fi, www.terveyskirjasto.fi



MEDICATION

Medication that has been started sufficiently early in a type 2 diabetes patient prevents damage caused by too high blood sugar in the body. Healthy lifestyles are always the basis for type 2 diabetes treatment regardless of medication.

The doctor will choose medication appropriate for your situation. Normally more than one drug is used in the treatment of type 2 diabetes to achieve the best results. You can influence the success of your medication by using the prescribed drugs regularly in accordance with instructions.

Oral Medications Lowering Blood Sugar



Metformin

Metformin lowers sugar production in the liver and improves the effect of the body's own insulin. It is recommended as a first choice drug in type 2 diabetes treatment. Metformin efficiently lowers blood sugar, is cheap and there is a long experience of using it. Metformin can be used alongside other diabetes drugs. The drug should be taken after a meal to reduce possible digestive symptoms.

Gliptins

Gliptins increase the amount of the GLP1 hormone produced in the intestinal tract and thus enhance the production of insulin in the pancreas when blood sugar is elevated. Gliptins are often used alongside metformin or other blood sugar lowering medication to enhance the reduction of blood sugar.

Gliflozins

Gliflozins enhance the discharge of sugar with the urine thus reducing blood sugar and weight to some extent. Gliflozins are the newest medicine group in the treatment of type 2 diabetes so the experience of using it is so far short. Gliflozins can be used together with other blood sugar lowering medication.

Sulphonylureas

Sulphonylureas increase insulin production in the pancreas and lower both blood sugar after a meal and fasting blood sugar. Sulphonylureas may lower blood sugar too much in conjunction with exercise or a delayed meal.

Glitazone

Glitazones increase the body's sensitivity to insulin, among other things by reducing the amount of fat in the liver. The drug may cause swelling, for which reason you should monitor your weight weekly at the beginning. Glitazone can be used together with other drugs lowering blood sugar if needed.

Glinides

Glinides are so-called meal tablets that are taken right before a meal containing carbohydrates. They quickly increase insulin discharge and work for about three to four hours, so they can be taken several times a day. They might be a good option if the problem is high blood sugar after a meal but morning blood sugar is only slightly elevated at the most.

Injection Drugs

GLP-1 Derivatives

The derivatives of the intestinal hormone increase insulin production in the pancreas when blood sugar is elevated and reduce the production of pancreatic glucagon that raises blood sugar. They also slow down the emptying of the stomach and make you feel fuller, which often makes you lose weight.

Insulin Treatment

The need for insulin treatment in type 2 diabetes is assessed individually. If your blood sugar is remarkably high already when you are diagnosed with diabetes, insulin treatment can be started immediately. Insulin treatment is also started if treatment goals cannot be achieved by lifestyle treatment and other medication or if there are indications that the body's own insulin production is declining.

Diabetes Medication is Specially Compensated

When you are diagnosed with diabetes the doctor writes the so-called B-statement (B-lausunto). The statement is sent to Kela which makes the decision on your right for the special compensation of diabetes medication. No other applications are needed. In conjunction with granting the special compensation your Kela card is renewed and the new card is mailed to you. The numerical code of the disease is marked on the card, so the compensation is calculated directly in the pharmacy if you show your card. However, there might be limitations on the compensation of individual drugs.

The story of Orion continues...

Orion has been building well being for over a hundred years.
Finnish well being has been built together – with hard work
and feeling. We provide employment opportunities and make
investments in Finland, with a heart of blue and white.

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Hyvinvointia rakentamassa