WHAT IS DIABETES MELLITUS?
TYPES, RISK FACTORS AND MEASUREMENT
WHAT IS DIABETES MELLITUS?

In Germany, about 6.7 million people suffer from diabetes, with a further 2–5 million being affected who are unaware of their illness. Diabetes mellitus is present when there is too much glucose in the blood (high blood glucose level). Glucose is an important source of energy for the organism. It is so important for us that our body produces it when we need it, even though the major portion comes from the food we eat. Blood glucose is regulated by the hormone insulin, which is produced in the pancreas.

WHAT IS DIABETES MELLITUS?

✓ Insulin is able to bring glucose (and thus energy) into the cells of the muscles, liver and fatty tissue.
✓ If insulin is present in insufficient quantities, the glucose accumulates in the blood and diabetes develops.

Medicines and above all the right lifestyle “cleanse” the blood, ensure correct functioning of the metabolism and prevent possible long-term damage to the organs.

WHICH TYPES OF DIABETES ARE THERE AND HOW DO YOU NOTICE THEM?

TYPE 1 DIABETES, T1

This results from the destruction of the insulin-producing cells of the pancreas (the beta cells). This leads to a lack of insulin, so that the glucose in the blood cannot be processed properly. This type of diabetes is always treated with insulin in order to control blood glucose optimally.

TYPE 2 DIABETES, T2

This is a combined disorder: on the one hand the insulin cannot function properly (insulin resistance), on the other hand the pancreas does not produce sufficient insulin. In a first step, this type of diabetes is treated with a balanced diet, increased physical activity and by losing weight. Later on, treatment can include the administration of drugs, and insulin if necessary.
**WHAT IS DIABETES MELLITUS?**

**Other special types of diabetes include:**
- Gestational diabetes (occurs during pregnancy)
- And less frequent types such as:
  - Genetically caused diabetes
  - Drug-induced diabetes (for example during cortisone therapy)
  - Diabetes caused by certain diseases of the pancreas

**The main symptoms caused by elevated blood glucose in diabetes include:**
- Frequent urge to urinate
- Fatigue
- Excessive thirst
- Weight loss
- Deterioration of eyesight

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**RISK FACTORS FOR TYPE 2 DIABETES**

Factors that may predispose for onset of type 2 diabetes:

- Overweight
- Age
- Family history
- Occurrence of type 2 diabetes in the family
- High blood pressure
- Lack of exercise
- Pregnancy if diabetes onset occurs during pregnancy

**Type 1 diabetes:** the symptoms occur suddenly, especially in type 1 diabetes.

**Type 2 diabetes:** the above-mentioned symptoms are often not present, or in mild form only. The disease usually begins gradually over a period of several years and is often only discovered by chance in a blood test.

In many people, type 2 diabetes can be prevented or delayed by a timely change in an unhealthy lifestyle (insufficient diet, poor eating habits).
WHAT IS DIABETES MELLITUS?

A permanently high blood glucose level in diabetes can lead to secondary damage. The heart, kidneys, nerves (especially of the feet), as well as blood circulation in the brain, legs and eyes may be affected. To prevent such secondary damage as far as possible, blood glucose should be optimally controlled through diabetes treatment. Furthermore, all other risk factors that damage the heart, kidneys, blood vessels and eyes must also be treated.

HOW IS DIABETES DIAGNOSED?

The blood glucose level is determined to diagnose diabetes. This level is expressed as mg/dl or mmol/l. A further option is the determination of “long-term blood glucose”, HbA1c (glycolised haemoglobin). HbA1c reflects average blood glucose over the past two to three months and is also determined in a blood test by your doctor.

The value of glycolised haemoglobin (HbA1c) can be expressed in two ways: as % or mmol/mol.

<table>
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<th>5.0</th>
<th>6.0</th>
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<tbody>
<tr>
<td>HbA1c mmol/mol</td>
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The current blood glucose level can also be measured. In this case, the blood glucose content of a drop of blood from the fingertip is determined using a blood glucose meter. This measurement can also be done at home and is useful for therapy adjustment.

The doctor will discuss with you whether blood glucose measurement at home makes sense for you and how it is done.

In addition to the treatment of blood glucose, it is important to control blood pressure and cholesterol optimally. It is especially important to stop smoking. Your doctor can help you with this.

Caring for oneself can limit the symptoms of diabetes. Regular examinations, for instance of the heart, eyes and feet, are also important.
WHAT IS DIABETES MELLITUS?

WHAT DO THE READINGS TELL US?

≥126 mg/dl (7 mmol/l)
Blood glucose on an empty stomach measuring a minimum of 126 mg/dl at least twice, or glycolised haemoglobin above 6.5 %, indicates diabetes.

100 – 125 mg/dl (5.6–6.9 mmol/l)
A measured value of 100–125 mg/dl indicates impaired glucose tolerance. Further checks are necessary.

70–100 mg/dl (3.9–5.6 mmol/l)
In non-diabetics, blood glucose on an empty stomach lies between 70 and 100 mg/dl with an HbA1c below 5.7%.

<70 mg/dl (3.9 mmol/l)
Hypoglycaemia: especially in older diabetics, an excessively low blood glucose level can be harmful.

WHEN IS BLOOD GLUCOSE WELL CONTROLLED IN TYPE 2 DIABETICS?

The individual target value depends on:

✓ Duration of diabetes
✓ Age of patient
✓ Concomitant diseases
✓ Type of therapy

Generally recommended blood glucose levels for type 2 diabetics:

100–125 mg/dl (5.6–6.9 mmol/l)
Blood glucose on an empty stomach

140–199 mg/dl (7.8–11.0 mmol/l)
Blood glucose 1-2 hours after a meal

HbA1c target range for well-controlled type 2 diabetes

6.5%–7.5% (48–59 mmol/mol)
Please discuss your personal target values with your diabetes team.

References
