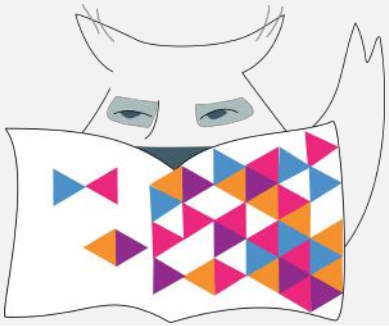
Diabetes mellitus?
I already know!

A cell

Our body is made up of billions of little pieces - **cells**.

Each cell is a “brick” that **builds our body**.

How it **works?**



Food

We need food to feed every cell
in our bodies. This allows it to **function smoothly. Live.**

Our body digests everything we eat. The stomach
and intestines convert food into small molecules such as

glucose.

Glucose

Glucose is the primary source of energy for the cell.

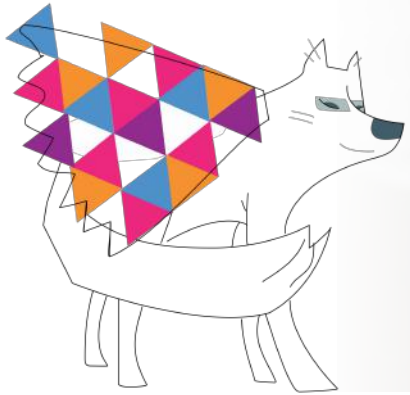
Glucose molecules enter the blood. Blood circulates throughout the body and delivers glucose to every cell.

eating

digesting

glucose

No insulin, no action



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Key

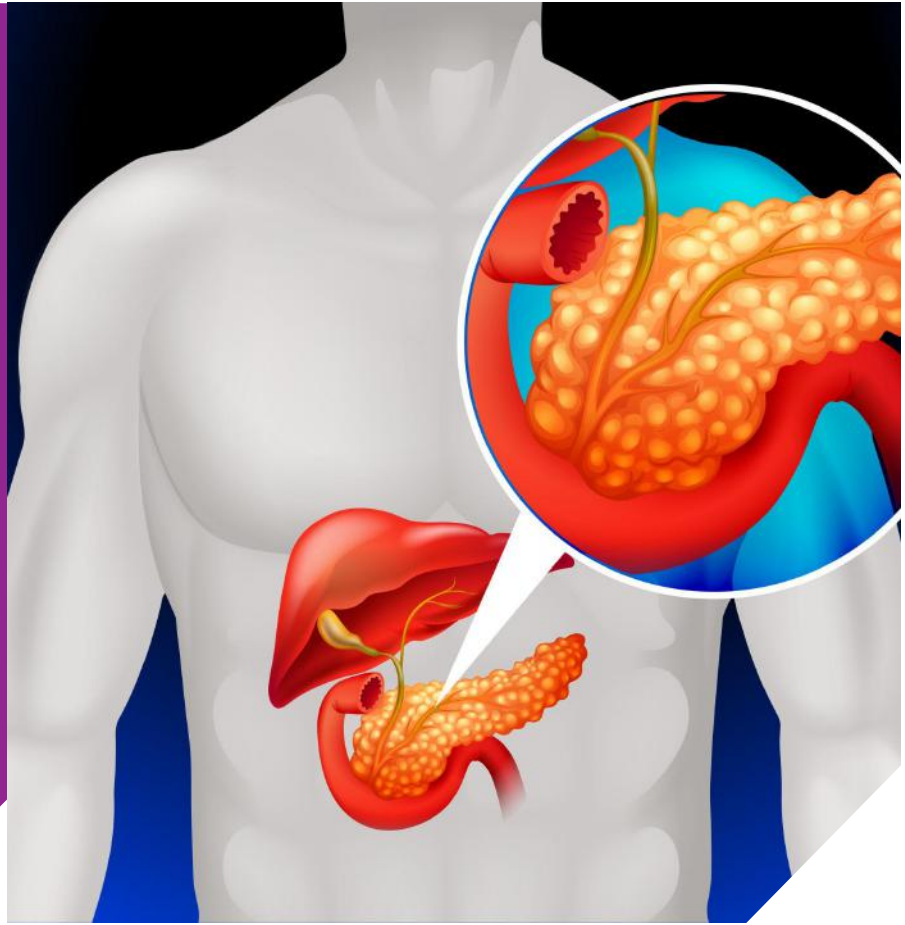
Glucose itself cannot
enter the cell.
It needs the right
key to open its doors.

That key is **insulin.**

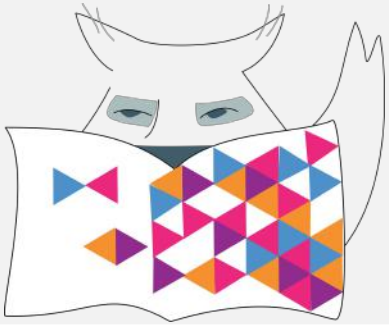
Pancreas

It is located in the abdominal cavity between the stomach and intestines. Among other things, it is involved in the production of insulin.

Thanks to insulin, glucose from the blood enters the cell.



Where does **diabetes mellitus** come from?



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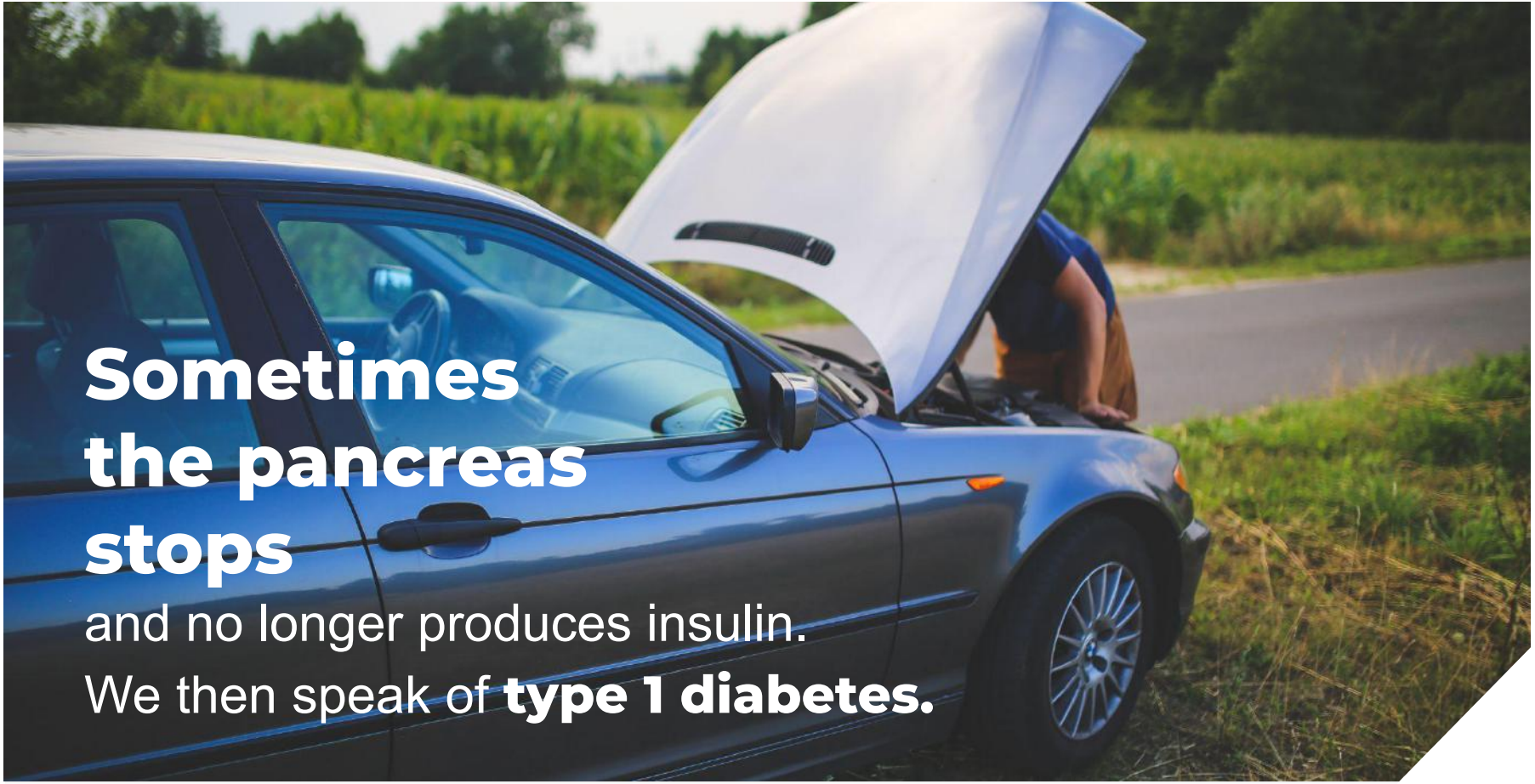

Sometimes the pancreas stops

and no longer produces insulin.

We then speak of **type 1 diabetes.**

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It's not your fault, nor your parents’

Lack of insulin

Something happens in the body that causes the body to start destroying the pancreas, which eventually stops producing insulin.

It is not clear why

We do not know why this happens and why it happened to you.

It's not your fault

It's not your fault, nor your parents’.

Diabetes mellitus was also not caused by what you ate before you got the disease.

A companion in life

The diabetes that has come into your life will stay with you.

If you understand it well, it can become your invisible friend.

Symptoms of diabetes mellitus

when glucose builds up in the blood...

you feel hungry
You constantly feel like having a snack.

you are thirsty
You are constantly thirsty, and your mouth is dry.

you feel unwell
You feel irritable,
you have trouble concentrating.

you go to the toilet often
You want to pee because your body wants to get rid of excess glucose.

you have skin problems
Skin problems appear.

you lack energy
And you are sleepy.

you lose weight
The cells are looking for other food, so they start “consuming” fat and muscle.

Fortunately, diabetes and lack of insulin can be managed.

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How do you deal with it?

1. A pen or a pump

Insulin can be injected using a pen or a pump.

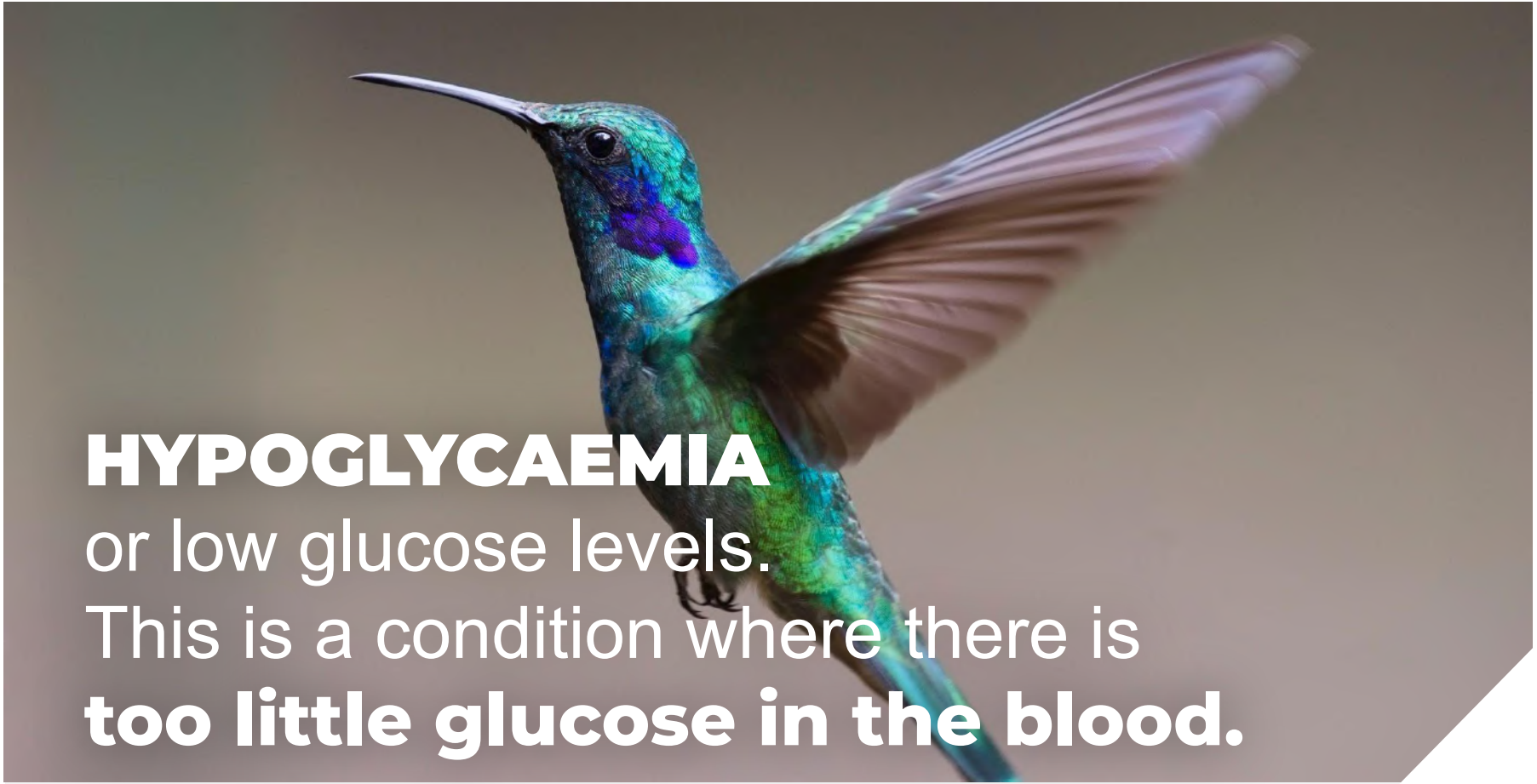
You cannot take it orally because your stomach will digest it and the insulin will not work.

2. Glucose measurements

Keep a self-monitoring diary and measure your glucose regularly.

3. Healthy diet

Follow a proper diet to keep your blood glucose levels in check.



HYPOGLYCAEMIA
or low glucose levels.
This is a condition where there is
too little glucose in the blood.

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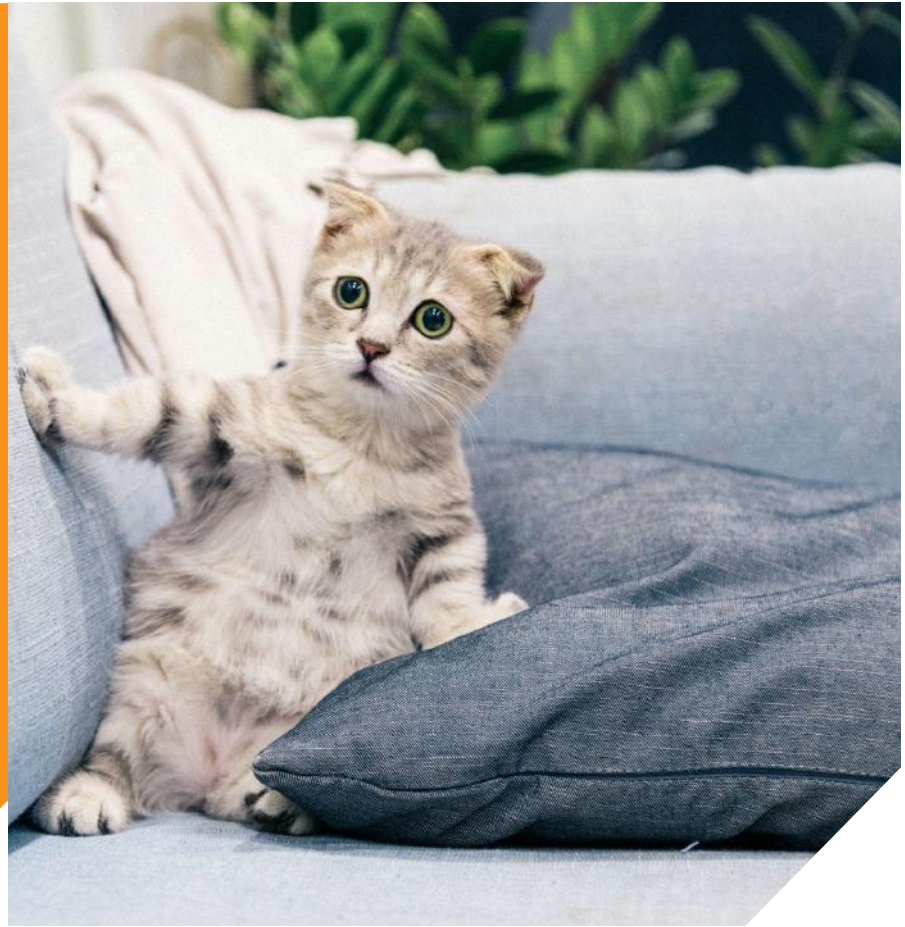
Hypoglycaemia

It occurs when there is

too little glucose

in the blood.



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Why does this happen?

If you give **too much insulin**, the blood **glucose will drop too much** and the body will be in a **hypoglycaemic** state.

When does this happen?

Not enough food

Too much insulin

Intensive physical effort

What are the symptoms of hypoglycaemia?

Symptoms of hypoglycaemia 1/3

Glucose measurement
below 70 md/dl

Paleness

Cold sweat

Sensation of warmth, heat

Accelerated heartbeat

Tremor

Weak knees

Impaired vision

Hunger and uncontrollable appetite

Symptoms of hypoglycaemia 2/3

Headache, dizziness

Wide pupils

Confusion

Impaired memory

Change in behaviour:
Hilarious laughter, inappropriate to the situation, sudden unprovoked crying.

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Night-time symptoms of hypoglycaemia 3/3

!

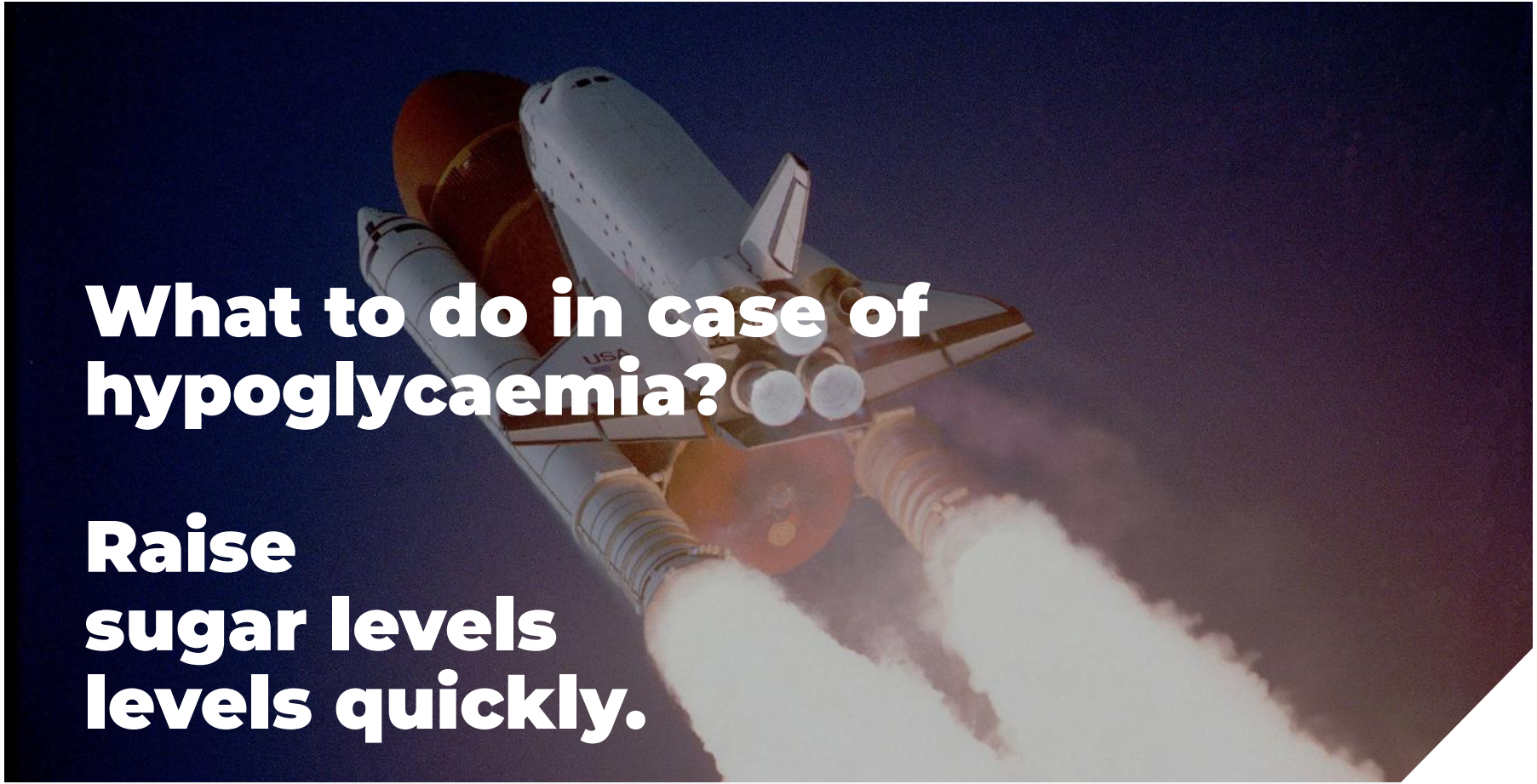
Symptoms usually NO knock you out of sleep

Night sweats

Low glucose levels in the morning

Restless sleep

Nightmares



What to do in case of hypoglycaemia?

Raise sugar levels levels quickly.

The easiest way to raise your sugar levels is to take **glucose.**

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What to do? 1/3

1.

Glucose tablets or gel (simple carbohydrates) should be administered

Child up to 15kg:
0.25 CE of glu1cose (2.5 g)
Child 15-30 kg:
0.5 CE of glucose (5g)
Child 35-70 kg:
1 CE of glucose (10 g)
Patient >70 kg:
1.5 CE of glucose

2.

Take a glucose measurement

Measure blood glucose levels after 10 –15 minutes.

3.

Re-administer glucose

If hypoglycaemia persists, take another dose of glucose.

4.

Re-measure your glucose

After another 60 minutes, measure the glucose again.

What to do? 2/3

Rest
and monitor
your sugar levels.

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What to do at night? 3/3

09:00 pm - 12:00 am at night

- Administer glucose, complex carbohydrates e.g. sandwich (pen).
- Administer glucose (pump).
- Reduce the flow of basal insulin (pump).

around 3:00 am at night

- Administer glucose (pen/pump).
- Reduce the flow of basal insulin (pump).

HIPOGLYCEMIA and physical effort

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I was supposed to workout, but I suffer from hypoglycaemia.

1.
Eat
first a portion of simple carbohydrates.

2.
Measure your blood glucose level,
when it rises eat a complex meal with protein and fat (e.g. a cheese sandwich).

3.
Reduce the flow
of basal insulin in the pump.

4.
Go for a workout,
when blood glucose levels are normal.

5.
Do not work out,
if blood glucose levels are not rising.

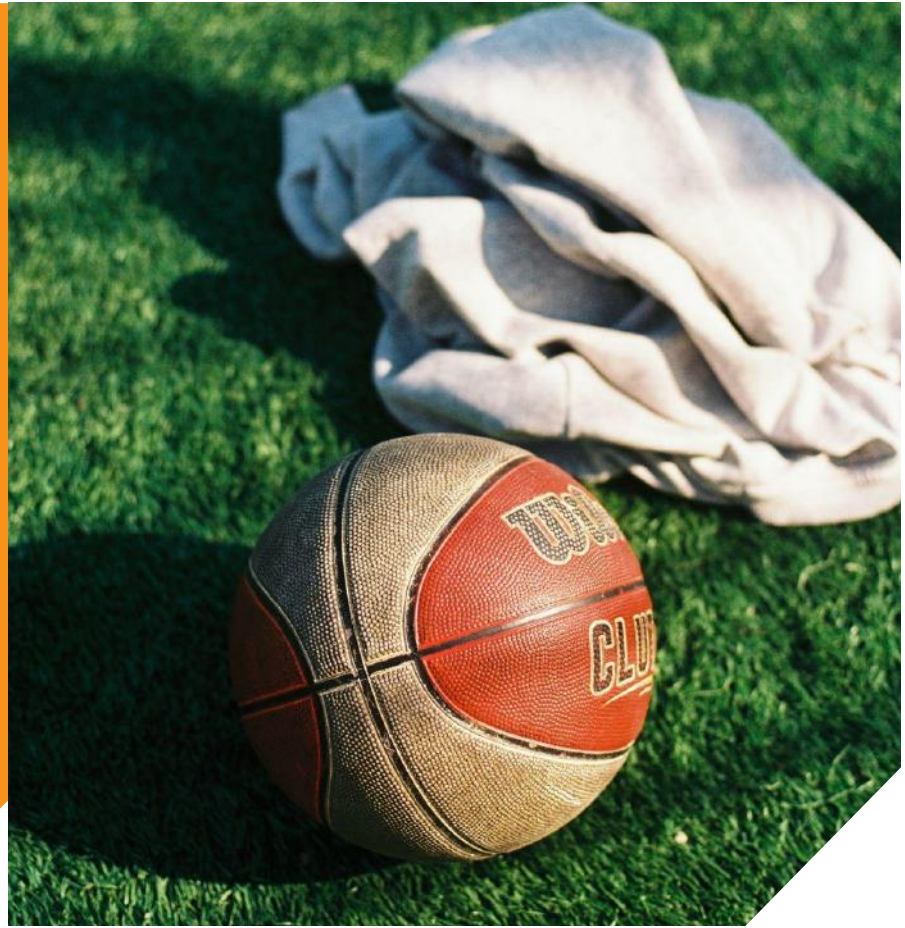
During training

1. Reduce the flow of basal insulin in the pump.

2. Eat simple carbohydrates e.g. glucose, fruit, fruit juice.

After training

1. Take glucose.
2. Re-measure after 15 minutes.
3. Reduce the flow of basal insulin in the pump for 2-4 h.



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A case of severe hypoglycaemia

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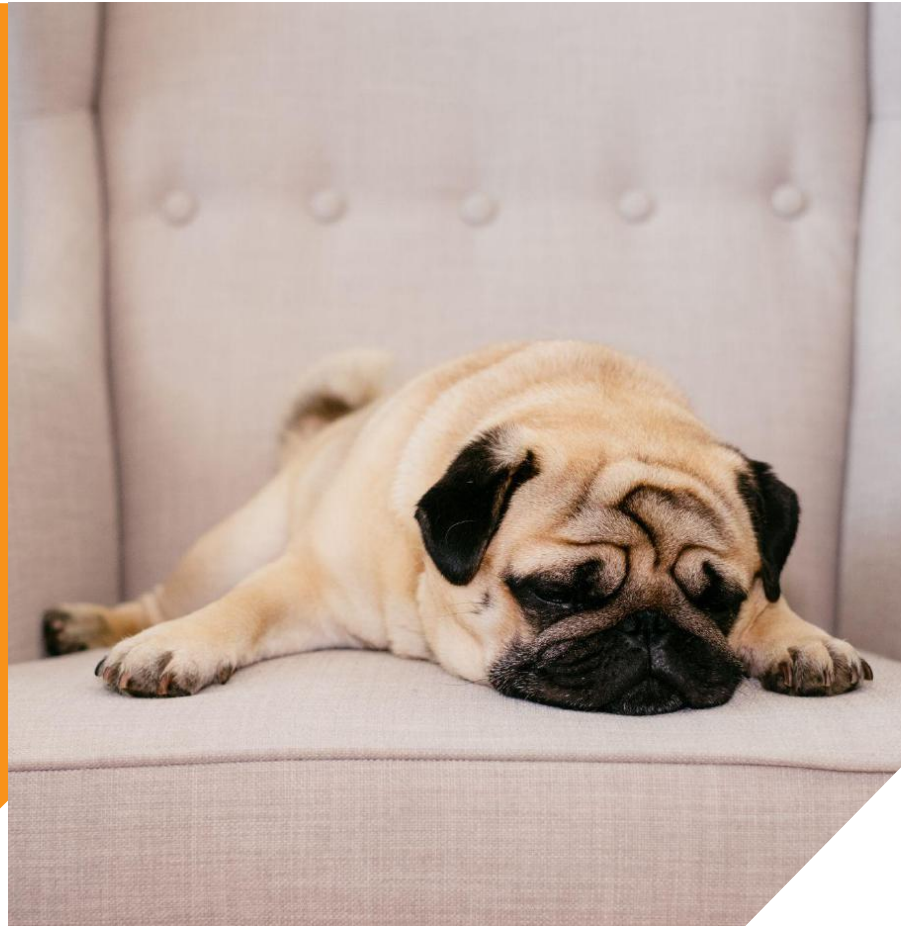
Symptoms

- no contact with the outside world
- loss of consciousness
- convulsions



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HYPERGLYCAEMIA

This is a condition where there is **too much glucose** in the blood.

Why does hyperglycaemia occur?

Too little insulin

- dose not stated
- expired insulin
- altered insulin (e.g. opaque, cloudy, abnormal appearance)
- an obstructed line in the case of an insulin pump
- formation of an abscess at the injection site
- an obstructed drain, air/blood in the drain

Too big a meal

If you eat an extra meal,
you must administer an extra dose of insulin

How do you know it's hyperglycaemia?

blood sugar measurement

How do you know it's hyperglycaemia?

dry mouth

increased thirst

headache

frequent urination

malaise

attention deficit disorder

blurred vision

fatigue, drowsiness

excessive weight loss

What to do?

What to do?

Administer additional insulin dose (adjustment)

- pen - as specified by the doctor
- with pump therapy, administer the pump adjustment dose as specified by the doctor

Drink fluids

- water
- tea
- fruit tea

Check glucose levels after 1.5-2 hours

If still too high administer another dose of insulin (adjustment).

If:

- blood glucose is above 240 mg/dl or HI appears on the meter
- hyperglycaemia lasting more than 4 h
- nausea or vomiting occurs
- acetone/rotten apple smell

Measure:

- urine glucose on Keto-diastix strips
- ketones in blood on a glucometer
- ketones in urine on Keto-diastix strips

Urine test

Perform a urine test using Ketodiastix tests.

These are strips that show the amount of glucose and ketone bodies in the urine.

How to perform a urine test correctly? 1/2

1.

Pee into a clean jar/cup.

2.

Take one strip test from the container.

Hold the plastic tip of the strip test.
Do not touch the reaction area of the strip test.

3.

Dip the tip of the Keto-diastix strip into the urine.

How to perform a urine test correctly? 2/2

4.

Read the results.

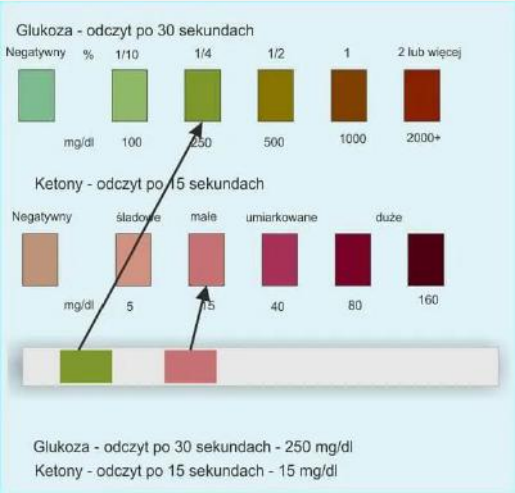
Compare the colour obtained on the strip with the colour fields on the container.

5.

The darker the colour, the higher the levels of glucose and ketone bodies.

6.

Take a picture of the test.



https://leki.pl/poradnik/keto-diastix%E2%93%A1-domowa-diagnostyka-w-cukrzycy/

IMPORTANT INFORMATION Urine test

Expiry date

Never use tests
after the expiry date as it may lead to underestimation of results.

Proper storage

Store the tests **at room temperature.**

Protect the container **from direct sunlight.**

Protection from moisture, light and heat is essential **to maintain unchanged reagent activity.**

Original packaging

Store the strips **in their original packaging.**

The packaging is equipped **with a drying agent.**
Do not remove it.
It keeps strip tests in a dry environment.

Measurement of ketones in blood

1.
Use a blood glucose meter.

2.
Use special strips to determine ketone bodies.

3.
Measure as you would sugar levels.

IMPORTANT INFORMATION Measurement of ketone bodies

Check the expiry date.

Do not use expired test strips.

Use immediately after taking out.

Use the test strip **immediately after taking it out** of the foil packaging.

Do not use a test strip if the packaging **is punctured or torn.**

Do not remove the strip during the test.

Do not remove the test strip from the glucose meter or **change its position** during the test countdown.

Prevention

To avoid hyperglycaemia and the presence of ketone bodies, remember important rules.

What to do for prevention? 1/2

insulin

Take insulin as prescribed by your doctor.

meals

Eat your meals in the right amounts and at the right times, do not overeat between meals, and drink plenty of water.

sugar levels

Check blood sugar levels before each meal and record the results in a self-monitoring diary.

physical activity

Exercise regularly.

change of insulin delivery site

Change insulin injection sites regularly.

expiry date of insulin

Check the expiry date of the insulin and store it in appropriate conditions.

What to do for prevention? 2/2

storage of insulin

Store insulin properly.

appropriate dose

Remember to administer **INSULIN IN ACCORDANCE WITH YOUR DOCTOR'S RECOMMENDATION.**

oral hygiene

Tooth decay is an inflammatory condition that causes glycaemia to be elevated.

whole body hygiene

Take care of your personal daily hygiene.

stress

Pay attention to stress – a school test, a sports competition.

inflammations

Pay attention to inflammatory conditions in the body e.g. runny nose, raised temperature, infections, tooth decay.

KETOACIDOSIS

or acute complication of diabetes

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What is it about acidosis?

1. Glucose

Glucose is formed from food, circulates in the blood and enters the cells thanks to insulin.

2. Problem

When there is no insulin or not enough insulin a problem arises.

Glucose circulates in the blood, but there is too much of it and **the cells are hungry.** To feed the cells, the body starts looking for **other sources of energy.**

3. Where the energy comes from

The liver starts producing glucose. This increases the amount of it in the blood, but without insulin it has no chance of reaching the cells anyway.

The body gets its energy from proteins and fat.

.

4. Effect

A mess!

A mess

The body tries its best to cope with the lack of insulin. It looks for sources of energy for hungry and tired cells, but makes a lot of mess in the process.

These trials result in the formation of **ketone bodies and hyperglycaemia.** This condition can cause indisposition.

Why does this happen?

The cause of acidosis is too little or no insulin.

It's all in your hands not to let it happen.

You have a say in whether acidosis will develop.

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What can be done to prevent acidosis?

regularity

Administer insulin **regularly.**

measuring

Measure **blood glucose levels** and respond accordingly.

insulin

Do not use insulin if it is shaken, frozen, overheated or expired.

check the pen

Check
the insulin pen.

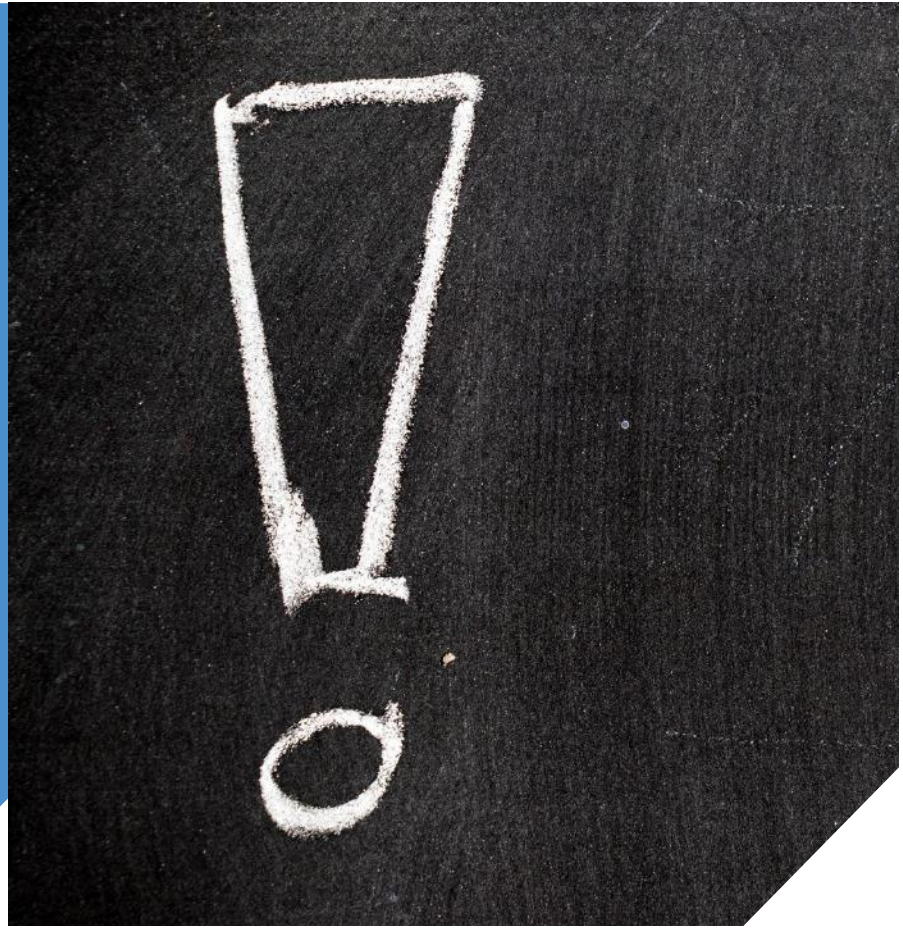
check the pump

Check the insulin delivery kit
in the pump.

injection site

Do not inject insulin
in so-called overgrowths.

Acidosis occurs
when there is no response
to prolonged hyperglycaemia.



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How to react in acidosis?

check your sugar levels

administer insulin

do not exercise intensively

drink plenty of liquids

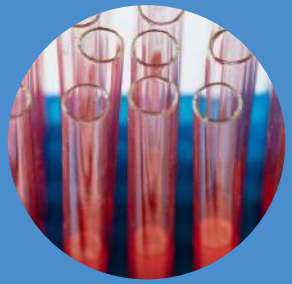
e.g. water with lemon

make sure,

that you have administered the insulin correctly and that your blood sugar levels are dropping

How do you know it's acidosis?

blood sugar measurement



blood ketone measurement
(other strips)

measurement of sugar and ketones in urine

What to do? 1/2

1. Adjustment

Administer **an adjustment dose** of insulin:

- **with a pen** to lower blood glucose by 150-200 mg/dl,
- **on the pump,** replace the infusion set and increase the base to 200%.

2. Blood glucose measurement

Measure blood glucose **every 1.5 - 2h.**

In addition**, administer correction doses of insulin** so as to lower blood glucose by 150-200 mg/dl per hour.

3. Ketones in urine/blood

Test **ketones in urine.**

There should be fewer and fewer of these in each subsequent test.

What to do? 2/2

4. Lukewarm water

If you vomit, drink **water with lemon**, preferably cold, in small portions.

5. Contact

Contact **your diabetes centre.**

6. No food

Don't eat as long as you are experiencing symptoms of hyperglycaemia and nausea.

Replenish electrolytes, drink:

1. Water from vegetable stock (definitely with lots of potatoes and carrots, salted to taste).
2. Then have a vegetable soup.
3. Soup with barley flakes, barley soup.

Do not eat raw vegetables and fruit within the first 24 hours after hyperglycaemia.

IMPORTANT

At the onset of acidosis be in contact with a diabetes centre.

This will enable the people at the centre to tell you how to proceed properly and, if necessary, prepare a place in hospital.

Thank you for your attention

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