**SAADI AKADEEMIA**

Free guide · Insulin resistance

# Insulin resistance checklist

Signs and indicators worth watching for even before blood sugar rises on lab tests.

**Dr Sergey Saadi**

saadiacademy.ee · kursused@synage.ee

Educational material · Sisu üle vaadatud: 2026 · järgmine ülevaatus 2027

BEFORE YOU START

# How to Use This Guide

This checklist helps identify early signs of insulin resistance even before blood tests show elevated blood glucose. The sooner you notice them, the easier it is to change course.

Important. This guide is educational material. It does not provide personalised medical advice or replace a medical consultation, diagnosis or treatment. If you have a chronic condition, take medication (especially medication that lowers blood sugar or blood pressure), are pregnant or are breastfeeding, discuss any changes to your diet or fasting with your GP or treating doctor beforehand.

## The Academy’s Approach in Brief

Saadi Akadeemia focuses on lifestyle and health optimisation: we look not just at a single test result or symptom, but at how nutrition, blood sugar, sleep, light, stress, physical activity and the nervous system influence one another. Most everyday complaints — fatigue after meals, sugar cravings, poor sleep, abdominal fat, anxiety — are often different manifestations of the same metabolic imbalance.

| Pillar | Why It Matters |
|---|---|
| Nutrition and Blood Sugar | Stable glucose and lower insulin = steadier energy, fewer cravings, healthier body weight. |
| Sleep and Light | Circadian rhythm regulates hormones, appetite and recovery. Blue light in the evening shifts this rhythm. |
| Stress and the Nervous System | Chronic stress raises cortisol and blood sugar; the vagus nerve helps the body calm down. |
| Physical Activity and Muscles | Muscle is the body’s largest “consumer” of glucose — every walk after a meal counts. |
| Awareness and Measurement | Tests and self-monitoring show whether the changes are really working. |

PART 1

# What is insulin resistance?

Insulin resistance means that cells respond less effectively to insulin. The pancreas compensates by producing more insulin. This condition can go undiagnosed for years because fasting glucose remains within the normal range.

| Stage | What happens | What a standard blood test shows |
|---|---|---|
| 1. Early | Cell sensitivity decreases, insulin rises | Glucose within the normal range, insulin not measured |
| 2. Compensated | Insulin remains consistently high, abdominal fat increases | Glucose within the normal range or borderline |
| 3. Prediabetes | Compensation is no longer sufficient | Glucose and HbA1c rise |
| 4. Type 2 diabetes | Blood glucose remains consistently high | Diagnosis |

Key message: the greatest opportunity for change is in stages 1–2, when standard blood tests are still “normal”. This is precisely why measuring insulin and HOMA-IR is so informative.

## Why it develops

PART 2

# Checklist

## Physical signs

- ☐ Increased waist circumference (over 80 cm in women and over 94 cm in men are common warning thresholds)
- ☐ Darker, velvety patches of skin on the neck, in the armpits or in the groin area
- ☐ Small skin tags on the neck, in the armpits or on the eyelids
- ☐ In women, irregular menstrual cycles, acne or excessive hair growth
- ☐ Elevated blood pressure

## How you feel

- ☐ Drowsiness after meals
- ☐ Strong cravings for sweets or white bread
- ☐ Hunger soon after eating
- ☐ Difficulty losing weight despite making an effort
- ☐ Afternoon energy slump

## Blood tests (if performed)

- ☐ Fasting insulin at the upper end of the laboratory reference range
- ☐ HOMA-IR 1,5 or higher
- ☐ HbA1c 5,5 % or higher
- ☐ High triglycerides and low HDL cholesterol
- ☐ Borderline liver enzymes (ALAT) or fatty liver detected on ultrasound


*Educational material—does not replace medical consultation, diagnosis or treatment.*

Interpretation: the more items you check, the greater the likelihood that insulin sensitivity has decreased. This checklist does not replace a diagnosis — discuss your results and laboratory tests with your doctor.

PART 3

# What you can do yourself

## Five ways to improve insulin sensitivity

- Reduce insulin spikes: fewer refined carbohydrates, with protein and vegetables at the start of each meal.
- Give insulin a break: 3 meals without snacking, with an overnight break of at least 12 hours.
- Use your muscles: strength training 2–3 times a week and a walk after meals.
- Sleep and unwind: 7–9 h of sleep, stress management, vagus nerve exercises.
- Measure: repeat laboratory tests with your doctor to see whether the changes are working.

## Keto and fasting — when they can help

Low-carbohydrate and ketogenic diets, along with time-restricted eating, are effective at lowering insulin levels in many people. However, they require knowledge of electrolytes, adequate protein intake, medication adjustments and a gradual transition. If you take blood glucose-lowering medication, make changes only in consultation with your doctor.

## 14-day getting-started plan

| Days | Focus | What to do |
|---|---|---|
| 1–3 | Drinks | Replace all sugary drinks and juices with water, tea or mineral water. |
| 4–6 | Snacking | 3 meals a day, with no snacks. |
| 7–9 | Physical activity | A walk after each main meal. |
| 10–12 | Overnight break | At least 12 hours between your last meal and breakfast. |
| 13–14 | Muscles | Two simple strength-training sessions (squats, push-ups, plank) and a review of results. |

PRACTICAL WORKSHEET

# Your plate, a sample day and measurement

## The plate rule


*Educational material—does not replace medical consultation, diagnosis or treatment.*

| Portion of the plate | What goes there |
|---|---|
| Half | Non-starchy vegetables: salad greens, cabbage, broccoli, cucumber, peppers, courgette |
| A quarter | Protein: eggs, fish, meat, cottage cheese, legumes |
| A quarter or less | Carbohydrates in whole-food form: potatoes, buckwheat, berries — or more vegetables |
| In addition | Fat for flavour: olive oil, butter, avocado, nuts |

## Sample day

| Meal | Example |
|---|---|
| Breakfast | An omelette made with 2–3 eggs and vegetables, a slice of wholegrain bread or avocado |
| Lunch | A large salad with fish or chicken, olive oil; eat the salad first, then the protein |
| Evening | Roasted vegetables and meat or fish; a handful of berries for dessert |
| Drinks | Water, mineral water, tea, black coffee |

## How to measure your waist circumference correctly

The simplest way to start: cut out sugary drinks starting tomorrow and take a 10-minute walk after dinner.

PART 4

# Where insulin resistance manifests in the body

| Organ | What happens | What you may notice |
|---|---|---|
| Muscles | Glucose does not enter muscle cells efficiently. | Fatigue, poor recovery. |
| Liver | The liver continues to produce glucose and accumulates fat. | Higher morning glucose, fatty liver. |
| Adipose tissue | Fat breakdown and storage are disrupted; inflammation occurs. | Abdominal fat, difficulty losing weight. |
| Blood vessels | The function of the inner lining of blood vessels deteriorates. | Higher blood pressure. |
| Ovaries | High insulin increases androgen production. | Irregular menstrual cycles, acne (PCOS). |
| Brain | Appetite and satiety signals weaken. | Sugar cravings, hunger after eating. |

## Two scientific perspectives


*Educational material—does not replace medical consultation, diagnosis or treatment.*

Scientists do not agree on whether excess weight or insulin resistance develops first. One school of thought presents evidence that excess energy and fat accumulation in the liver and muscles cause resistance. The other emphasises that high insulin promotes fat storage and hunger. Both have supporting evidence – the processes probably reinforce each other, and the practical steps are the same.

## Insulin resistance at a normal weight

Even a slim person can have insulin resistance, especially if fat accumulates around the internal organs, muscle mass is low or there is a family history of type 2 diabetes. That is why looking at weight alone is not enough – waist measurement, test results and how you feel provide a better picture.

Insulin and blood sugar are discussed in depth in the book “Veresuhkru ohtlikud saladused” (Varrak): varrak.ee

PART 5

# A closer look at the tests

| Marker | What it shows | How to interpret it |
|---|---|---|
| Fasting glucose | Blood sugar in the morning before eating. | A late marker; it may remain within the normal range for a long time. |
| Fasting insulin | How much insulin is needed to maintain glucose levels. | An early sign; different laboratories use different ranges. |
| HOMA-IR | Glucose × insulin / 22,5. | Some studies consider values below 1,0–1,5 favourable. |
| HbA1c | Average blood sugar over about 3 months. | Anaemia and other conditions can affect the result. |
| TG/HDL ratio | Triglycerides divided by HDL (mmol/l). | A higher ratio may indicate insulin resistance. |
| ALAT, GGT | Liver health. | A borderline elevation may accompany fatty liver. |
| Glucose tolerance test | Glucose and, if needed, insulin 2 h after a sugary drink. | A doctor decides whether it is needed. |

There is no scientific consensus on optimal ranges – they are based on individual studies. The laboratory's reference ranges apply, and a doctor interprets the result.

## Example of a HOMA-IR calculation

Glucose 5,2 mmol/l and insulin 9 µU/ml: 5,2 × 9 / 22,5 = 2,1. With the same glucose but insulin of 4 µU/ml, the result would be 0,9. Two people can have the same “normal” blood sugar but very different insulin requirements. Calculate your result: HOMA-IR calculator.


*Educational material—does not replace medical consultation, diagnosis or treatment.*

## How to prepare

- ☐ Do not eat for 10–12 hours; you may drink water.
- ☐ Avoid alcohol and very strenuous exercise the evening before.
- ☐ Postpone the test if you are ill (a cold, fever).
- ☐ Write down your medications and supplements.

PART 6

# Exercise and nutrition in practice

## Why exercise works even before your weight changes

Working muscles take up glucose from the blood even without insulin. Studies show that even a 10–15-minute walk after a meal reduces the post-meal rise in blood sugar. Strength training increases muscle mass, providing long-term storage capacity for glucose.

| Physical activity | How | How often |
|---|---|---|
| Walking after a meal | 10–15 minutes at a relaxed pace | After the largest meal |
| Strength training | Squats, lunges, presses, resistance band rows | 2–3 times a week |
| Endurance | Brisk walking, cycling, swimming | A total of at least 150 min per week |
| Breaking up sitting time | 2–3 minutes of movement every 30–60 minutes | Every day |

## Food order and composition

- Eat vegetables first, then protein and fat, and carbohydrates last – the post-meal rise in glucose is smaller.
- Fibre (vegetables, legumes, seeds) slows glucose absorption.
- Include protein at every meal – it helps you feel full and supports muscles.
- Sugary drinks and juices are the fastest source of glucose – replace them with water.
- Potatoes, rice and pasta that have been cooked and cooled contain more resistant starch.

## Medication

Some people also need medication (for example, metformin or newer medications). This is a doctor's decision and does not mean failure. Lifestyle remains the foundation even when taking medication.

The Ainevahetuse Kood course turns these steps into an 8-week plan: saadiacademy.ee/kursused


*Educational material—does not replace medical consultation, diagnosis or treatment.*

WORKSHEET

# My signs and test results

| Date | Waist (cm) | Glucose | Insulin | HOMA-IR | HbA1c | TG/HDL |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

| Dayti me | Walking after a meal | Strength training | Sugary drink | Sleep (h) |
|---|---|---|---|---|
| 1. | | | | |
| 2. | | | | |
| 3. | | | | |
| 4. | | | | |
| 5. | | | | |
| 6. | | | | |
| 7. | | | | |

The Dr Saadi Club covers one topic each month, with a protocol and a live broadcast: saadiacademy.ee/klubi

QUESTIONS

# Frequently asked questions

| Question | Answer |
|---|---|
| Is insulin resistance reversible? | Many people experience a marked improvement in insulin sensitivity with lifestyle changes. The extent depends on genetics, age and how long the condition has been present. |
| Do I need to cut out carbohydrates completely? | No. For many people, changing their quality, quantity and the order in which they are eaten is enough. A low-carbohydrate diet is one option, not a requirement. |
| Is fasting necessary? | No. An overnight break from eating without snacking is a simple starting point. Discuss longer fasts with your doctor, especially if you take medication. |
| Why doesn't my GP measure insulin? | Insulin is not always included in routine blood tests, and its reference ranges vary. Ask your doctor whether measuring it would be useful in your case. |
| Is fruit forbidden? | No. Whole fruit and berries with their fibre are different from juice or a sugary drink. |
| How quickly do test results change? | Post-meal glucose responds quickly; HbA1c reflects about 3 months. Your doctor decides when to repeat the test. |


*Educational material—does not replace medical consultation, diagnosis or treatment.*

WHAT NEXT

# Your next step in the Academy

This guide gave you an initial overview. Insulin resistance is a central topic in the Academy's core course, "Ainevahetuse Kood". The biggest change comes when you understand the full picture and can ask for explanations. The Academy offers several levels for this — choose the one that suits you right now.

| Step | What it is | Where to find it |
|---|---|---|
| 1. Free materials | Other guides in the same series: blood sugar, sleep, the vagus nerve, inflammation, laboratory tests, insulin resistance. | /tasuta-materjalid |
| 2. Free videos | Brief explanations of the most important topics — a good place to start. | /tasuta-videod |
| 3. Webinars | Live sessions and recordings on a single topic, with questions and answers. | /veebinarid |
| 4. Courses | A structured, multi-week learning programme, including the core course "Ainevahetuse Kood". | /kursused |
| 5. Dr Saadi Club | Monthly materials, live sessions, an archive and a community. Members receive discounts on webinars and courses. | /klubi |
| 6. Book | "Veresuhkru ohtlikud saladused" (published by Varrak) — the whole subject in one book. | varrak.ee |

All addresses begin with: saadiacademy.ee — for example, saadiacademy.ee/klubi.

Which option is right for you? If you simply want to get started — free videos. If you have one specific question — a webinar. If you want to improve your metabolic health step by step — a course. If you want ongoing support and new materials every month — the club.

## What the Academy does not do

The Academy is an educational platform. We do not diagnose conditions, prescribe treatment or provide personalised medical advice online. We do, however, help you understand your body, test results and options, so you can have more meaningful discussions with your doctor and make informed everyday decisions.

ABOUT THE AUTHOR

# Dr Sergey Saadi and Saadi Akadeemia

Dr Sergey Saadi is a doctor who has been practising since 2010 and focuses on metabolism, blood sugar, insulin resistance and the effects of lifestyle on health. He is the author of "Veresuhkru ohtlikud saladused" (published by Varrak) and the founder of Saadi Akadeemia. The Academy aims to make evidence-based knowledge understandable and usable in everyday life.

## Topics we cover at the Academy


*Educational material—does not replace medical consultation, diagnosis or treatment.*

| Topic | What you will learn |
|---|---|
| Blood sugar and insulin | How metabolism really works and how to interpret it through test results |
| Low-carbohydrate nutrition and keto | How to find the right level for you and make the transition safely |
| Fasting and time-restricted eating | For whom, how and when these approaches are suitable — and when they are not |
| Sleep, light and circadian rhythm | Blue light, morning light, evening routines |
| Stress and the vagus nerve | Training the nervous system’s ability to calm down |
| Inflammation and testing | What to measure, how to understand the results and discuss them with your doctor |

## Questions and contact

Write to us: kursused@synage.ee. We will reply as soon as possible and in the language of your message (Estonian, Russian or English). All materials and news: saadiacademy.ee.

All purchases come with a 14-day right of withdrawal, and purchased recordings remain accessible for at least one year.

© Saadi Akadeemia (OÜ Süsivesik). This material may be shared unchanged with a reference to saadiacademy.ee. Content reviewed: 2026 · next review 2027.