

Metabolic syndrome vs prediabetes

Metabolic syndrome and prediabetes are distinct entities with different diagnostic criteria, but they share key components.

Prediabetes



Term used to classify individuals whose glucose or haemoglobin A1C do not meet the criteria for type 2 diabetes mellitus (T2DM) but remain intermediate between normoglycaemia and diabetes.¹



Global prevalence in adults aged 20-79²

Impaired glucose tolerance (IGT)
9.1%
2021

10%
2045

Impaired fasting glucose (IFG)
5.8%
2021

6.5%
2045

For a prediabetes diagnosis:¹



Haemoglobin A1C

- 5.7-6.4% (39-47 mmol/mol).

AND/OR



IFG

- 5.7-6.4% (39-47 mmol/mol).

AND/OR



IGT

- 2 hours plasma glucose measure during 75-g oral glucose tolerance test ranging from 7.8 mmol/l (140 mg/dl) to 11.0 mmol/l (199 mg/dl).

Metabolic syndrome



Condition marked by a complex set of physiological, biochemical, and metabolic factors, such as abdominal obesity, insulin resistance, hypertension, raised triglycerides and reduced high-density lipoprotein cholesterol (HDL-C).³



12.5-31.4%
global prevalence in adults^{4,5}



Abdominal obesity

- > 102 cm in males and > 88 cm in women according to ATP III criteria.
- IDF criteria propose ethnicity specific values.



Raised blood pressure

- Systolic \geq 130 mmHg, or diastolic \geq 85 mmHg.



Raised triglycerides

- \geq 1.7 mmol/l (150 mg/dl).



Reduced HDL-C

- < 1.03 mmol/l (40 mg/dl) in males and < 1.29 mmol/l (50 mg/dl) in females.



Raised fasting plasma glucose

- \geq 5.6 mmol/l (100 mg/dl).

If three out of five criteria according to ATP III definition⁶
OR
abdominal obesity criteria plus any other two criteria according to IDF definition are met⁷

Both prediabetes and metabolic syndrome share increased fasting plasma glucose levels \geq 5.6 mmol/l among their diagnose criteria (6.9 mmol/l is the upper limit in prediabetes)

Prediabetes is associated with:¹

Obesity (especially abdominal obesity)

Hypertension

High triglycerides levels

Decreased HDL-C levels

All of them are components of metabolic syndrome

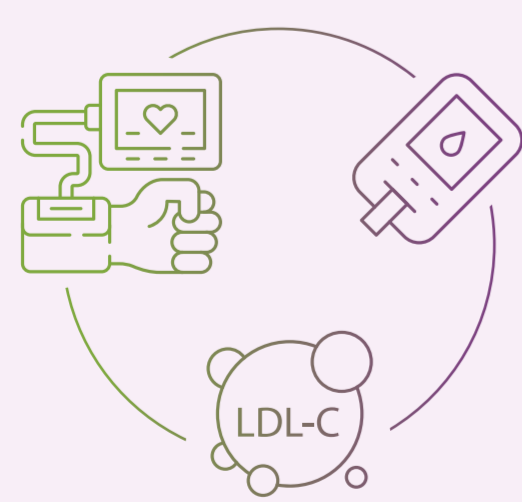
Progression from prediabetes to a T2DM state can aggravate hyperglycaemia and potentially affect other metabolic syndrome components.

Modest weight loss reductions can delay the progression of prediabetes to T2DM⁸ and sustained weight loss can improve glycaemia, blood pressure and lipid profile⁹.

Metabolic syndrome and prediabetes

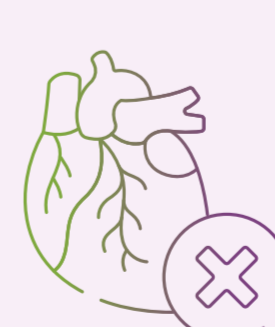
When prediabetes and metabolic syndrome coexist, progression to type 2 diabetes accelerates and cardiometabolic complication risk increases.¹⁰

In a cross-sectional study with 88 prediabetic participants, 69 with metabolic syndrome, stated that:¹⁰

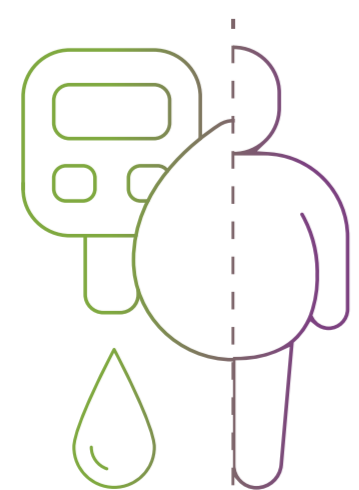


- The coexistence of prediabetes and metabolic syndrome is associated with increased systolic blood pressure, postprandial blood glucose, and low-density lipoprotein cholesterol (LDL-C).

A prospective study with 19,464 participants showed that:¹¹



- A shared diagnosis of prediabetes and metabolic syndrome increases the total risk of cardiovascular events by 1.57 times.



Given this overlap and the elevated cardiometabolic risk before diabetes onset, management should start early and be individualized to the patient's risks, preferences, and capacity for change.

ATP III, National Cholesterol Education Program's Adult Treatment Panel III; HDL-C, high-density lipoprotein cholesterol; IDF, International Diabetes Federation; IFG, impaired fasting glucose; IGT, impaired glucose tolerance; LDL-C, low-density lipoprotein cholesterol; T2DM, type 2 diabetes mellitus.

References

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