



International Diabetes Federation

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Rationale for new IDF worldwide definition of metabolic syndrome

A clear need in clinical practice and in research

The International Diabetes Federation (IDF) gathered experts from around the world to formulate a new, worldwide definition of metabolic syndrome for the following reasons:

- IDF believes that metabolic syndrome is driving the twin global epidemics of type 2 diabetes and cardiovascular disease. The prevalence of metabolic syndrome is estimated to be around 20–25 per cent of the population.¹ People with metabolic syndrome are twice as likely to die from and three times as likely to have a heart attack or stroke compared with people without the syndrome.² In addition, almost 200 million people globally have diabetes and 80 per cent of these will die from cardiovascular disease,³ so there is an overwhelming moral, medical and economic imperative to identify those individuals with metabolic syndrome early, so that lifestyle interventions and treatment may prevent the development of diabetes and/or cardiovascular disease.
- Existing guidelines put forward by the **World Health Organization (WHO)** and **National Cholesterol Education Program – Third Adult Treatment Panel (NCEP ATP III)**^{4,5} were never intended to provide exact diagnostic criteria for identifying individuals with metabolic syndrome in clinical practice.
- There is a stark need for a single, universally accepted diagnostic tool that is easy to use in clinical practice and that does not rely upon measurements only available in research settings.
- The existence of multiple definitions for the metabolic syndrome has caused confusion and has resulted in many studies and research papers comparing the merits of each definition. It has also proved difficult to make direct comparisons between the data from studies where different definitions have been used to identify the syndrome.
- The new IDF definition addresses both clinical and research needs, providing an accessible, diagnostic tool suitable for worldwide use and establishing a comprehensive 'platinum standard' list of additional criteria that should be included in epidemiological studies and other research into the metabolic syndrome.

Existing 'definitions'

A number of expert groups have developed clinical criteria for the metabolic syndrome. The most widely accepted of these have been produced by the WHO, the European Group for the Study of Insulin Resistance (EGIR), and NCEP ATP III.⁴⁻⁶ All groups agree on the core components of the metabolic syndrome: obesity, insulin resistance, dyslipidaemia and hypertension. However, they apply the criteria differently to identify such a cluster.



The WHO and ATP III guidelines are summarised in Tables 1 and 2.

Table 1: WHO clinical criteria for the metabolic syndrome⁴

<p>In order to make a diagnosis of the metabolic syndrome a patient must present with glucose intolerance, impaired glucose tolerance (IGT) or diabetes and/or insulin resistance, together with two or more of the following components:</p> <ul style="list-style-type: none"> • Impaired glucose regulation or diabetes • Insulin resistance (under hyperinsulinaemic euglycaemic conditions, glucose uptake below lowest quartile for background population under investigation) • Raised arterial pressure $\geq 140/90$ mm Hg • Raised plasma triglycerides (≥ 1.7 mmol/L; 150 mg/dL) and/or low HDL cholesterol (< 0.9 mmol/L, 35 mg/dL men; < 1.0 mmol/L, 39 mg/dL women) • Central obesity (males: waist to hip ratio > 0.90; females: waist to hip ratio > 0.85) and/or BMI > 30 kg/m² • Microalbuminuria (urinary albumin excretion rate ≥ 20g/min or albumin:creatinine ratio ≥ 30 mg/g)

Table 2: ATP III clinical identification of the metabolic syndrome⁵

Three or more of the following five risk factors:	
Risk factor	Defining level
Central obesity <ul style="list-style-type: none"> • Men • Women 	Waist circumference > 102 cm (> 40 in) > 88 cm (> 35 in)
Triglycerides	≥ 150 mg/dL (1.7 mmol/L)
HDL cholesterol <ul style="list-style-type: none"> • Men • Women 	< 40 mg/dL (1.03 mmol/L) < 50 mg/dL (1.29 mmol/L)
Blood pressure	$\geq 130/ \geq 85$ mm Hg
Fasting glucose	≥ 110 mg/dL (6.1 mmol/L)



The search for clarity

Because of the differences between the WHO and ATP III criteria, other groups such as the European Group for the Study of Insulin Resistance (EGIR) and the American Association of Clinical Endocrinology (AACE) have, at different times, documented modifications to the metabolic syndrome identification process.^{6,7} The **EGIR** version, preceding ATP III and designed to be used in non diabetics only, is simpler to use in epidemiological studies because it is dependent on fasting insulin levels to estimate insulin resistance and impaired fasting glucose (IFG) in place of IGT (avoiding the need for either a euglycaemic clamp or an oral glucose tolerance test (OGTT)). EGIR also proposed slightly modified measurements and cut-points for hypertension, triglycerides, HDL cholesterol and central obesity. The more recent **AACE** statement listed several identifying abnormalities including elevated triglycerides, blood pressure, fasting and post-load glucose (therefore requiring OGTT), in addition to a reduced HDL cholesterol and the presence of obesity and hypertension but stopped short of providing a specific definition of the syndrome, preferring instead that the diagnosis should rely on clinical judgment.⁷

The need for a global consensus

“Whichever definition is used and whatever the variation in the numbers due to the different criteria, when looking at prevalence data for the metabolic syndrome in different countries and across various ethnic groups, one fact is clear. Universally, the metabolic syndrome is a huge problem and is one that is growing at an alarming rate”.

Professor Sir George Alberti, co-author of the Consensus Statement

References

1. Dunstan DW, Zimmet PZ, Welborn TA et al. The rising prevalence of diabetes and impaired glucose tolerance. The Australian Diabetes, Obesity and Lifestyle Study. *Diabetes Care* 2002;**25**:829-34
2. Isomaa B, Almgren P, Tuomi T et al. Cardiovascular morbidity and mortality associated with the metabolic syndrome. *Diabetes Care* 2001;**24(4)**:683-9
3. *Diabetes Atlas*, second edition, International Diabetes Federation, 2003
4. World Health Organization. Definition, diagnosis and classification of diabetes mellitus and its complications. Report of a WHO consultation 1999
5. Executive summary of the Third Report of The National Cholesterol Education Program (NCEP) Expert Panel on detection, evaluation, and treatment of high blood cholesterol In Adults (Adult Treatment Panel III). *JAMA* 2001;**285**:2486-97
6. Balkau B, Charles MA. Comment on the provisional report from the WHO consultation. *Diabetic Medicine* 1999;**16**:442-3
7. American College of Endocrinology Task Force on the Insulin Resistance Syndrome: American College of Endocrinology Position Statement on the Insulin Resistance Syndrome. *Endocr Pract* 2003;**9**:236-52