

# The Metabolic Syndrome Update 2017

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## Discoslure

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Affiliation: Grants/Research Support  
Company: Regeneron  
Relationship: Terminated

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## Learning Objectives

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- Understand the components of the metabolic syndrome.
- Assess the risk associated with the metabolic syndrome

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## The Metabolic Syndrome Update

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- What is it?
- Why do we care?
- How do we define it?
- How should we manage it?

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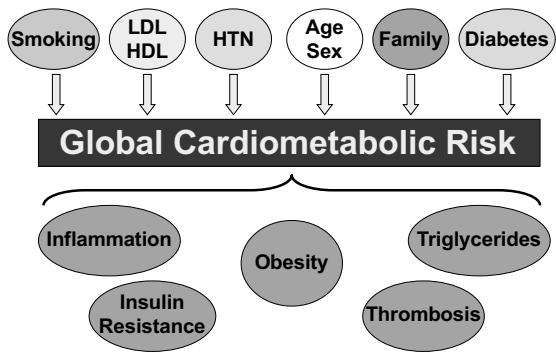
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## The Metabolic Syndrome: General "Clustering" of Features

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- Abdominal obesity
- Atherogenic dyslipidemia
  - Elevated Triglycerides
  - Low HDL-Cholesterol
  - Small dense LDL particles
- Raised blood pressure → HTN
- Insulin resistance → IFG, IGT, GDM, T2DM
- Prothrombotic state
- Proinflammatory state
- Non-Alcoholic Fatty liver disease
- Others?

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### Consensus Definition: *The Metabolic Syndrome*

Diagnosis Established When 3 or more are Present:

- Elevated Waist Circumference
  - Men: > 40 in; Women: > 35 in
  - Population and country specific
- Elevated Triglycerides: >150 mg/dl\*
- Low HDL Cholesterol\*
  - Men: < 40 mg/dl
  - Women: < 50 mg/dl
- Elevated Blood Pressure: >130/85\*
- Elevated Fasting Glucose: >100 mg/dl\*

Circulation 120:1640-1645, 2009

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### Population Specific Waist Circumference Thresholds

Population	Waist Circumference (cm)	
	Men	Women
Caucasian	102	88
Asian	90	80
Middle East	94	80
Sub-Saharan African	94	80
Central/South America	90	80

Circulation 120:1640-1645, 2009

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### Problems With the Definitions

- Should all factors be given the same weight?
- Who measures waist circumference?
- Is Impaired Fasting Glucose even at the 100 mg/dl cutoff sensitive enough? And now should we be using the A1c ( $\geq 5.7\%$ )?
- What about “treated” risk factors, should they still count?

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Why Should We Care About  
The Metabolic Syndrome?

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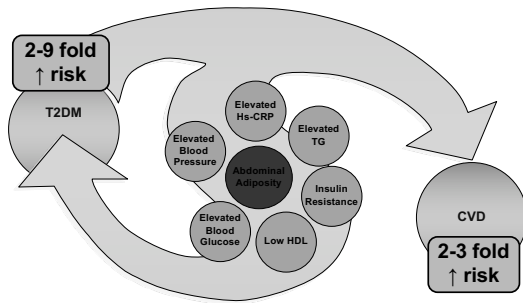
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Abdominal Adiposity as a  
Component of Cardiometabolic Risk



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*The Metabolic Syndrome*  
CVD Risk

- **Is the** CVD risk of the syndrome greater than the sum of its parts?
- Does the presence of the Metabolic Syndrome predict CVD incidence better than already established risk assessments?
- Does it matter?

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## Factors Supporting the Metabolic Syndrome as a CVD Risk Factor

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- It is accepted and well established that multiple risk factors confer greater risk.
- Majority of studies show the MetS to be an independent predictor of CVD risk.
- A recent meta-analysis found that the risk for CVD is still increased in people with the MetS (RR, 1.54), even after controlling for the component risk factors<sup>1</sup>.
- Post hoc analysis of 4S and AFCAPS/TexCAPS showed that individuals with the MetS had increased risk for major coronary events irrespective of their FRS<sup>2</sup>.

<sup>1</sup>J Am Coll Cardiol 49:403-414, 2007.  
<sup>2</sup>Am J Cardiol 93:136-141, 2004.

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## The Metabolic Syndrome Other Associated Conditions

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- Nonalcoholic Fatty Liver Disease
- OSA
- PCOS
- Hypogonadism
- Lipodystrophies
- Microvascular Disease
- Others

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## Is There a Unifying Pathophysiologic Cause of the Metabolic Syndrome?

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- Maybe – Maybe Not
- Abdominal adiposity and Insulin Resistance appear to be at core of pathophysiology of the Metabolic Syndrome AND its individual components
- Targeting visceral adiposity and insulin resistance should be central to the management of the Metabolic Syndrome patient
- All of the components of the Metabolic Syndrome improved when adiposity and insulin resistance are targeted

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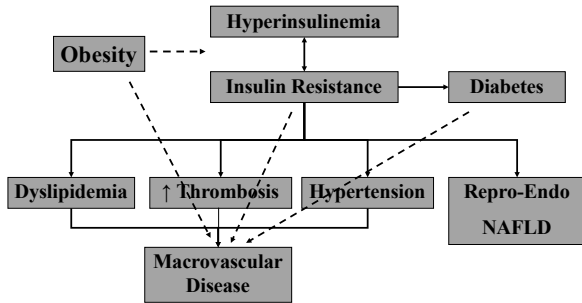
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## The Consequences of the Metabolic Syndrome




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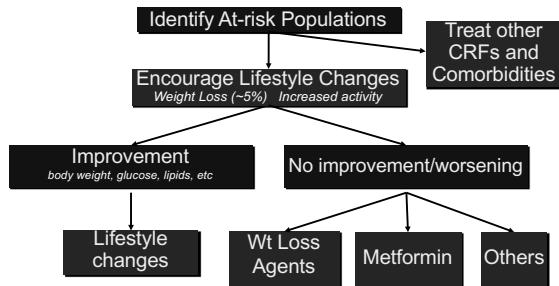
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## So What Should We Do? Proposed Clinical Approach to Treating the Metabolic Syndrome Patient




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## The Metabolic Syndrome Summary of the Problem

- Very common
- Associated with significant comorbidities
  - HTN
  - Dyslipidemia
  - Repro-Endo issues
  - Atherosclerotic Cardiovascular Disease
  - Progression to T2DM
- Many unanswered questions...

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