

# **Medical Nutrition Therapy in Metabolic Syndrome**

Dr. Mohammad Javad Hosseinzadeh-Attar  
(MD, PhD)

# Definition of MetS by Various Organizations

- ▶ **NCEP ATPIII** → Readily available to physicians
- ▶ WHO
- ▶ IDF (International Diabetes Federation)
- ▶ EGIR (European Group for the study of Insulin Resistance)
- ▶ AHA (American Heart Association)
- ▶ AACE (American Association of Clinical Endocrinologists)

## 4 Common Components Present in the Different Definitions:

1. **Obesity** → Abdominal adiposity
2. **Indicators of insulin resistance** → Impaired glucose metabolism
3. **Hypertension**
4. **Atherogenic dyslipidemia**

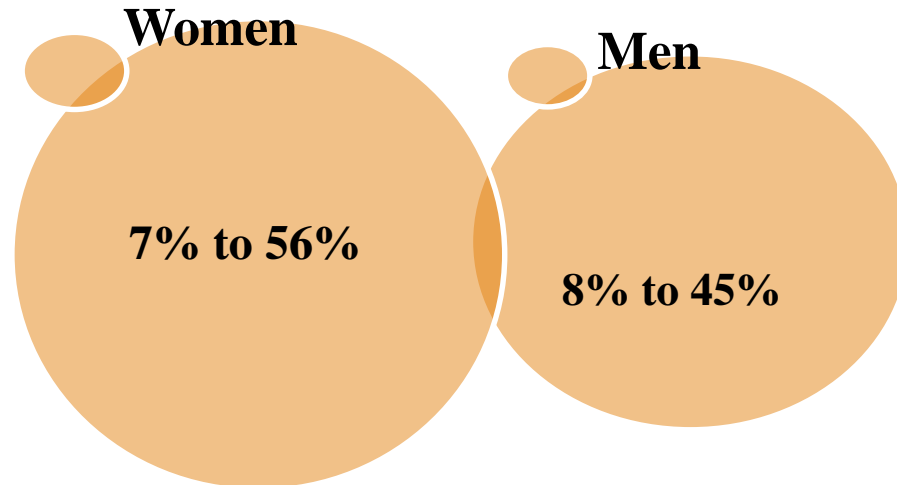
## MetS : At least Three of the Following

- ▶ **Elevated Waist Circumference**
- ▶ **Blood Pressure** (systolic > 130 and/or diastolic > 85 mmHg or drug treatment)
- ▶ **Fasting Glucose** (>100 mg/dL or drug treatment)
- ▶ **Triglycerides** (>150 mg/dL or drug treatment)
- ▶ **High-density lipoprotein (HDL)-cholesterol** (<40 mg/dL (male) or <50 mg/dL (female) or drug treatment)

# Global Prevalence of METs

- ▶ Varies from less than 10% to 84% depending on the region (city or village), sex, age, race and ethnicity of the studied populations and the definition of METs.
- ▶ Higher Prevalence with **Age**
- ▶ Higher Prevalence in **Women**

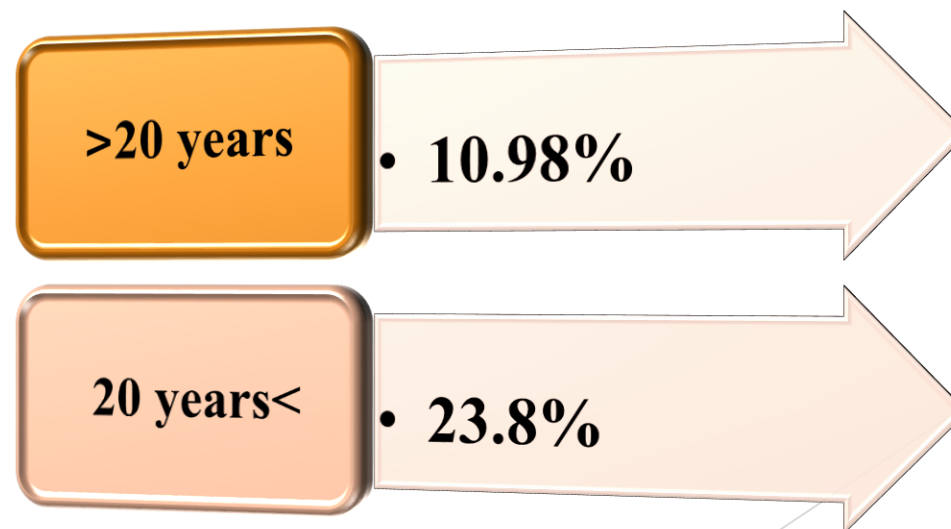
# Prevalence of METs in the world based on NCEP-ATPIII criteria



# Prevalence of METs in Iran

The most common components of metabolic syndrome in Iran:

- ❑ Low HDL cholesterol (59.7%)
- ❑ Hypertriglyceridemia (39.5%)

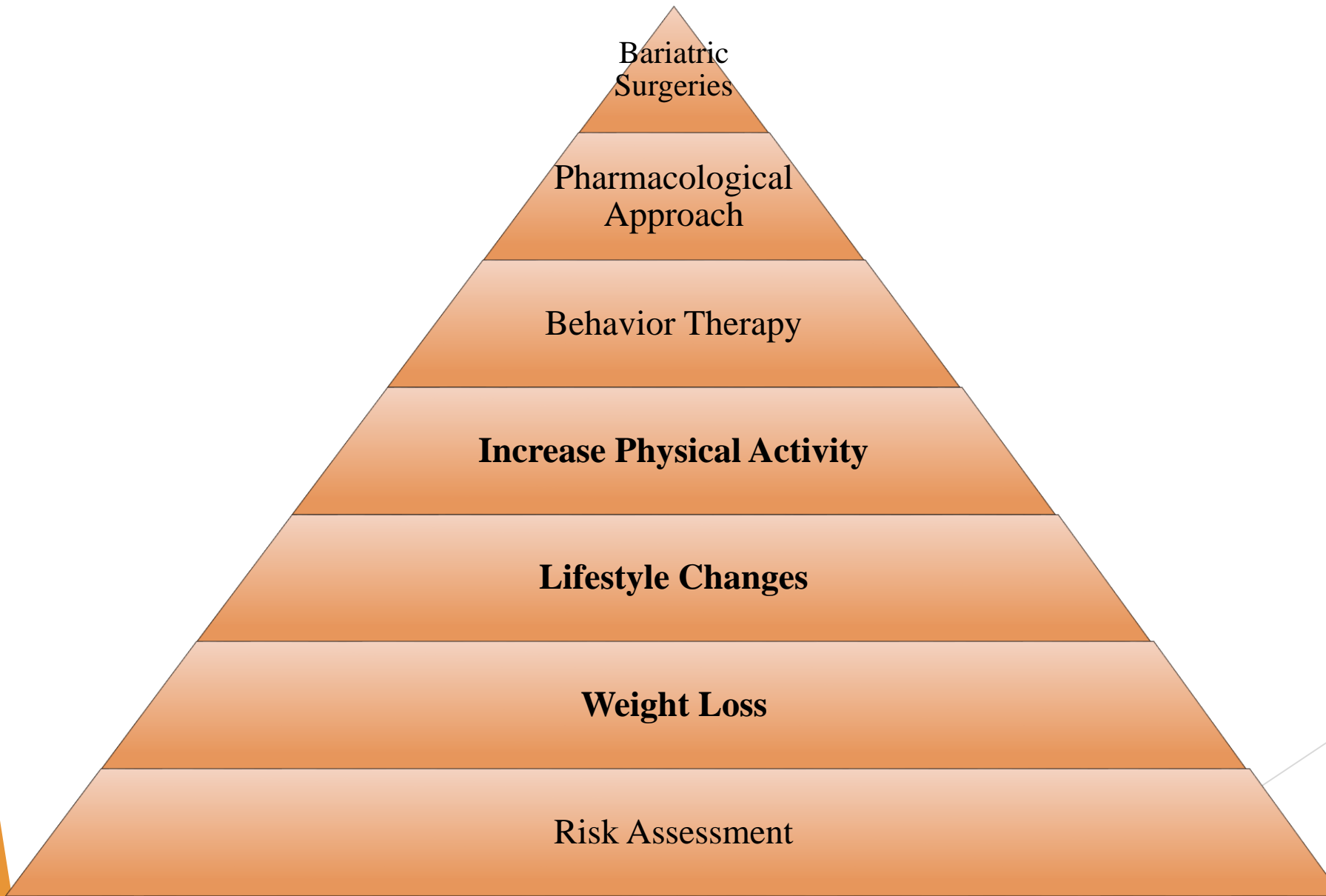


## Metabolic Syndrome, a Mild and Chronic Inflammatory Condition with Profound Systemic Effects on the Body

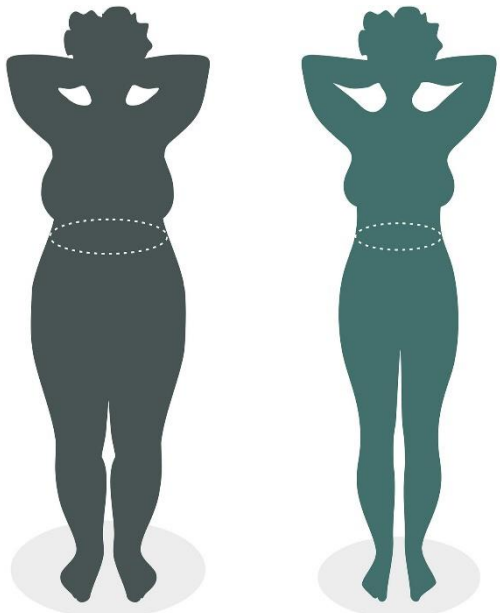
- Clinical management of METs is difficult because there is no known method to prevent or improve all components of the syndrome, which is primarily based on **Insulin Resistance**.
- Therefore, many physicians **treat each component** of METs **separately**.



# METs: Stages of Treatment



The first aim in METs is to achieve a loss of weight of **7% to 10%** from baseline total body weight during a period of **6 to 12 months**.



# General Dietary Recommendations (NCEP/ATP III)

- ▶ Carbohydrate energy intake to 50%–60%
- ▶ Protein to ~15%
- ▶ Fat to 25%–35%

# General Dietary Recommendations (NCEP/ATP III)

- ▶ Avoidance of trans fats
- ▶ Limited cholesterol (<300 mg/day)
- ▶ low saturated fat intake (<7% of total energy)
- ▶ Limited Refined sugar intakes (<10% of total energy)
- ▶ High intakes of fruits, vegetables, and whole grains

**Mediterranean, DASH, and Nordic diets**, which contain overall the same ingredients have shown a positive effect on several parameters of MetS.



**Adapt** this dietary pattern to appropriate **calorie requirements**, personal and **cultural** food preferences, and **nutrition therapy** for other medical conditions.



# DASH Diet

- ▶ Dietary approaches to stop hypertension
- ▶ High in fruits and vegetables, low-fat dairy products, whole grains, fish, and nuts
- ▶ Low in animal protein and sugar

# DASH Diet

- ❑ Diminished saturated fat, total fat and cholesterol
- ❑ Limited sodium:
  - no more than 2400 mg /day
  - at least 1000 mg/day



# Mediterranean Diet

- ▶ Moderate in total fat (32% to 35%)
- ▶ Low in saturated fat (9% to 10%)
- ▶ High in polyunsaturated fatty acids (especially omega-3)
- ▶ High in fiber (27 to 37 g per day)



# Mediterranean Diet Pyramid

*A contemporary approach to delicious, healthy eating*

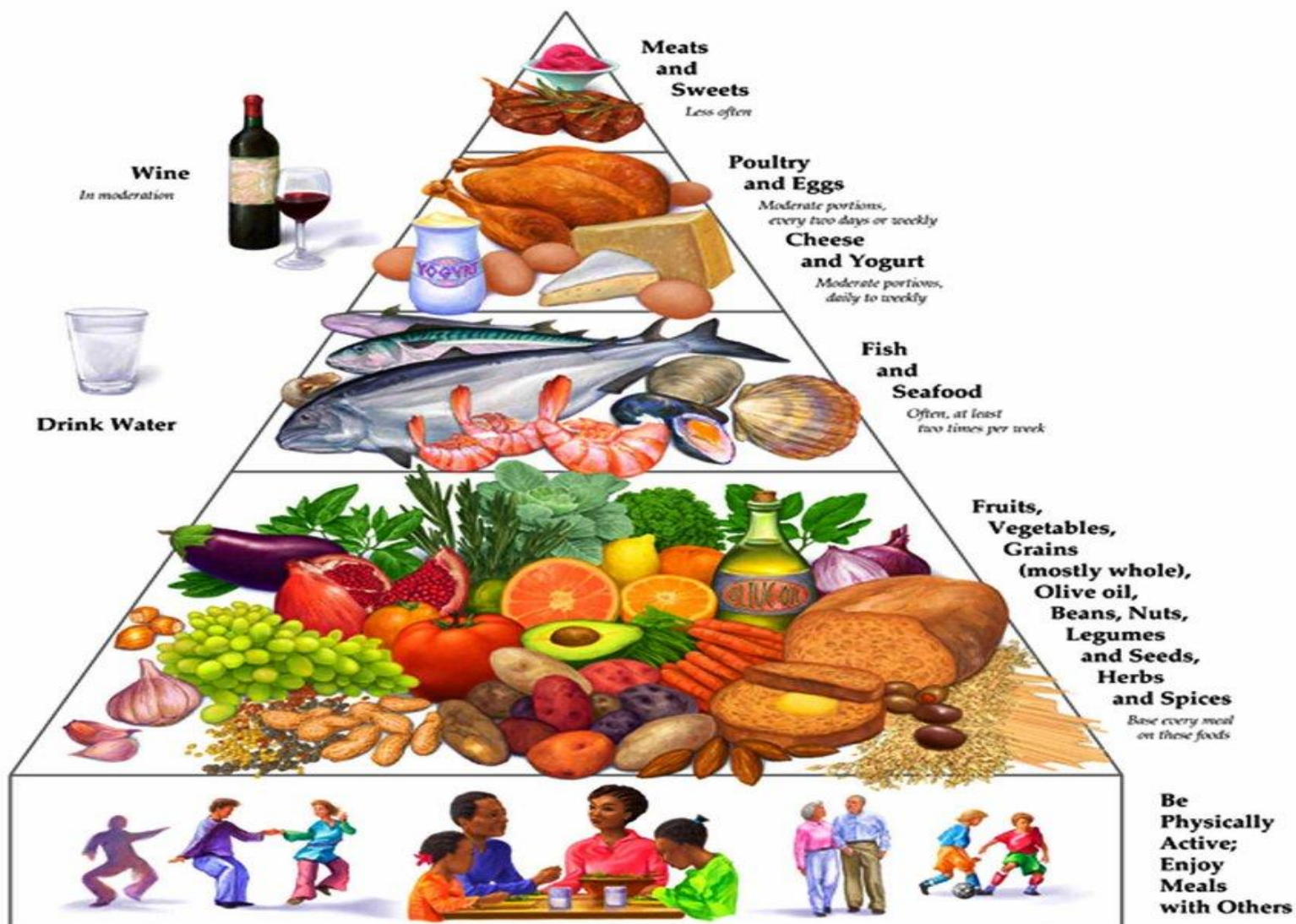


Illustration by George Middleton

© 2009 Oldways Preservation and Exchange Trust

[www.oldwayspt.org](http://www.oldwayspt.org)

# Benefit Oils for METs

- Olive oil (especially extra virgin)
- Fish oil
- Grape seed Oil
- Canola oil



# Nordic Diet

- ❑ The Nordic diet is a way of eating that focuses on locally sourced foods in the Nordic countries — Norway, Denmark, Sweden, Finland, and Iceland.
- ❑ It's similar to the **Mediterranean diet** and heavily emphasizes **plant foods** and **seafood**.



# Foods to Eat and Avoid in Nordic Diet

- ▶ **Eat often:** fruits, berries, vegetables, legumes, potatoes, whole grains, nuts, seeds, rye breads, fish, seafood, low-fat dairy, herbs, spices, and rapeseed (canola) oil
- ▶ **Eat in moderation:** meats, free-range eggs, cheese, and yogurt.
- ▶ **Eat rarely:** other red meats and animal fats
- ▶ **Don't eat:** sugar-sweetened beverages, added sugars, processed meats, food additives, and refined fast foods



# Nordic Diet

The Nordic diet is very similar to the Mediterranean diet. The biggest difference is that it emphasizes **canola oil** instead of extra virgin olive oil.



# What is Fructose?

- ▶ Known as “**fruit sugar**” because it primarily occurs naturally in many fruits
- ▶ Occurs in others foods such as **honey, sugar beets, sugar cane** and **vegetables**
- ▶ **Soft drinks** contain large amounts of high-fructose corn syrup (HFCS).

# Fructose

When absorbed, it does not stimulate the secretion of **insulin** or **leptin**.

Long-term daily consumption leads to:

- increase in weight
- decrease in insulin sensitivity
- development of MetS and type 2 diabetes



# Fructose

- ▶ Moderate fructose consumption of **50 g/day** or **10% of energy** has no deleterious effect on lipid and glucose control.
- ▶ >100 g/day does not influence body weight.
- ▶ Nevertheless, a higher intake is not recommended, and the **intake of sugar-sweetened beverages** should be **limited** or **avoided**.

# Physical Activity to Reduce Lipids & Blood Pressure

- ❑ 3-4 sessions a week
- ❑ Average 40 minutes per session
- ❑ Moderate-to-vigorous intensity



**THANK YOU  
FOR YOUR  
ATTENTION**