



# **Obesity & Metabolic Syndrome**

## **Causes & Health Risk**

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# What is Obesity

**Abnormal or excessive fat accumulation  
that presents a risk to health**



# What is Metabolic Syndrome

## The World Health Organization (WHO) criteria for metabolic syndrome (Syndrome X):

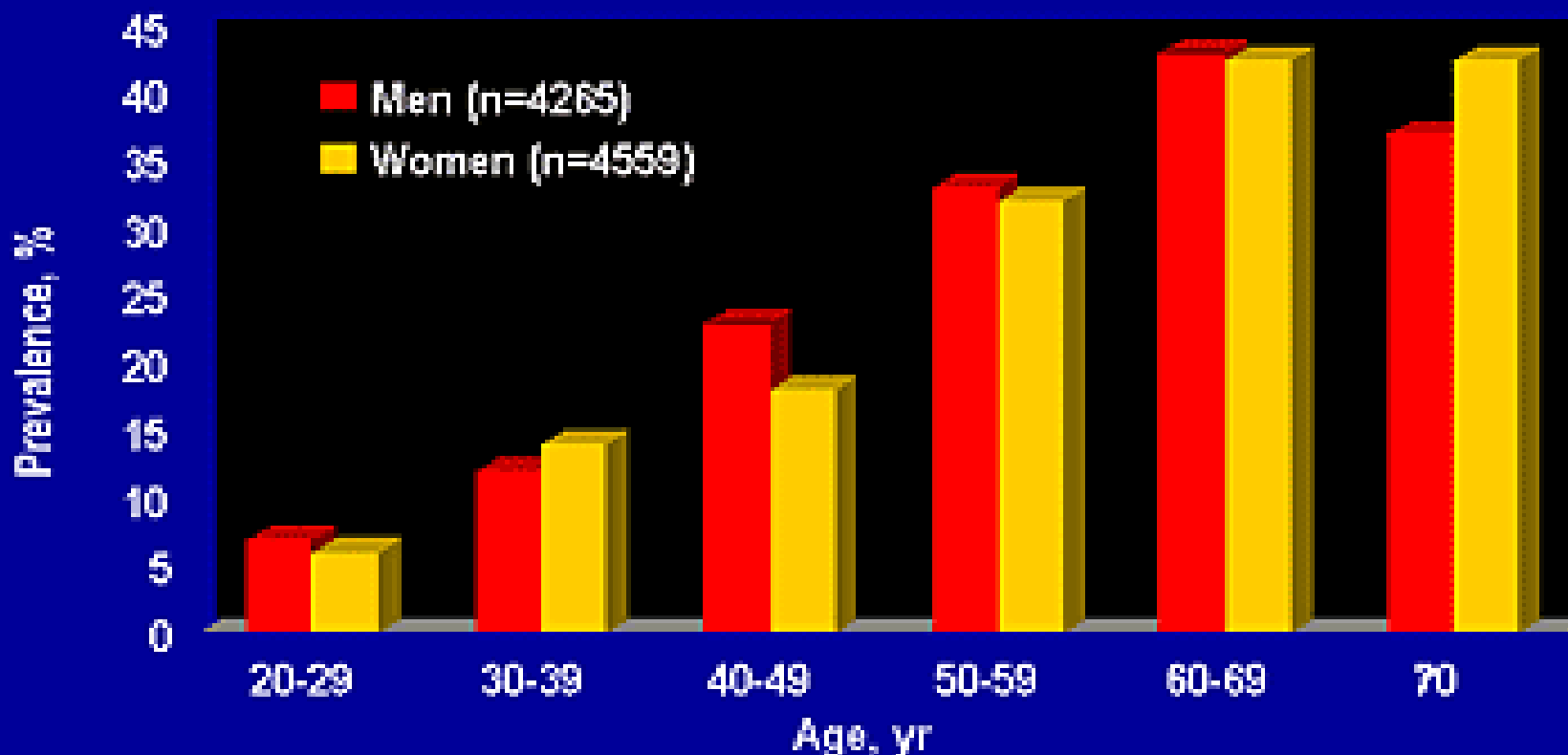
- ✓ High blood glucose levels (insulin resistance) plus at least 2 of the following:
  - ✓ Abdominal obesity
    - ❖ Waist : hip  $> 0.9$ , BMI  $> 30$ , or waist  $> 37$ "
  - ✓ High triglycerides or low HDL cholesterol
    - ❖ Triglyceride  $> 150$  mg/dl
    - ❖ HDL cholesterol  $< 35$  mg/dl
  - ✓ High blood pressure
    - ❖  $> 140/90$  or on treatment for hypertension



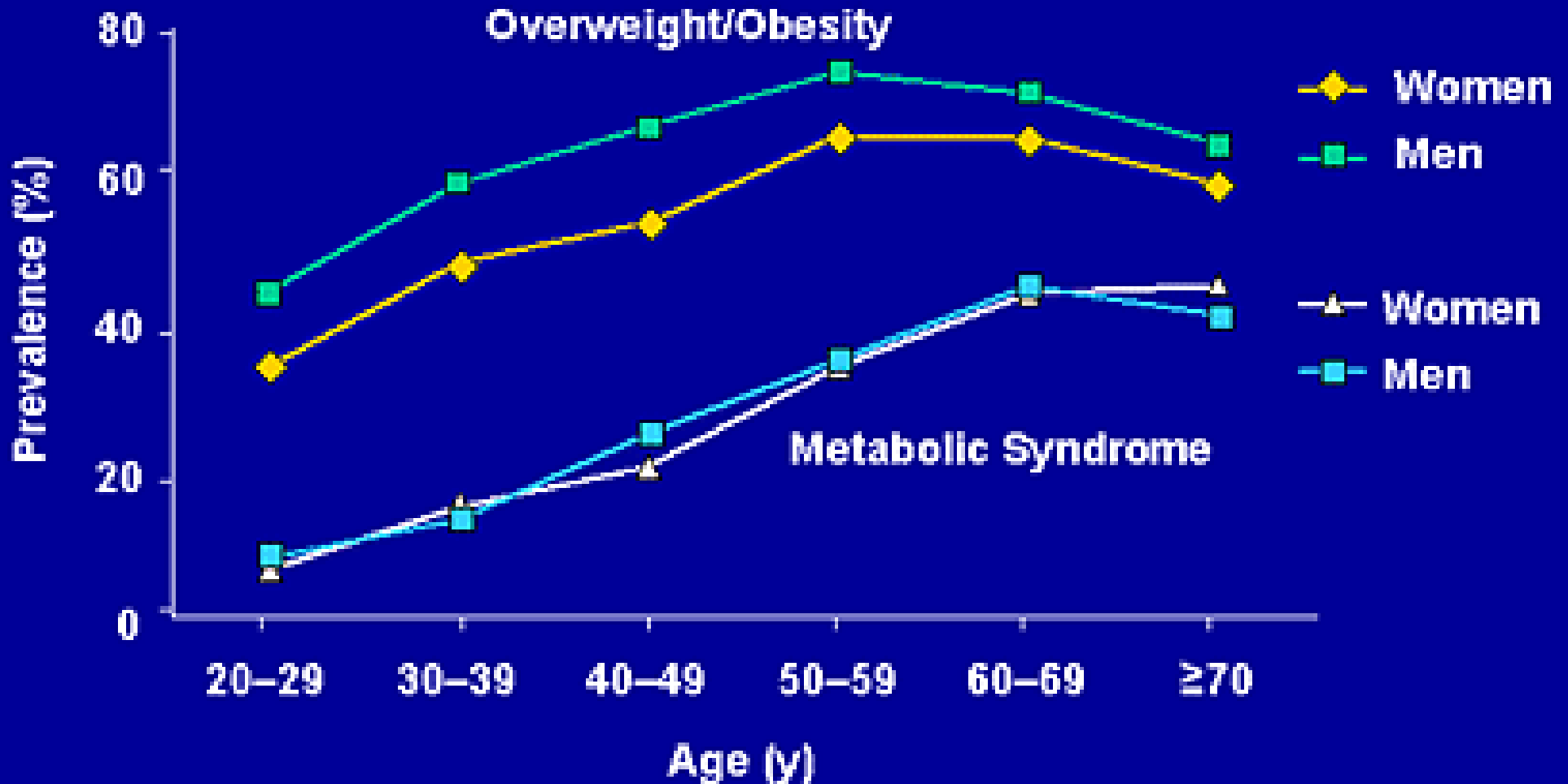
# Prevalence of Metabolic Syndrome

## Metabolic Syndrome: Prevalence Increases With Age

47 million or 23% of US Adults Have Metabolic Syndrome

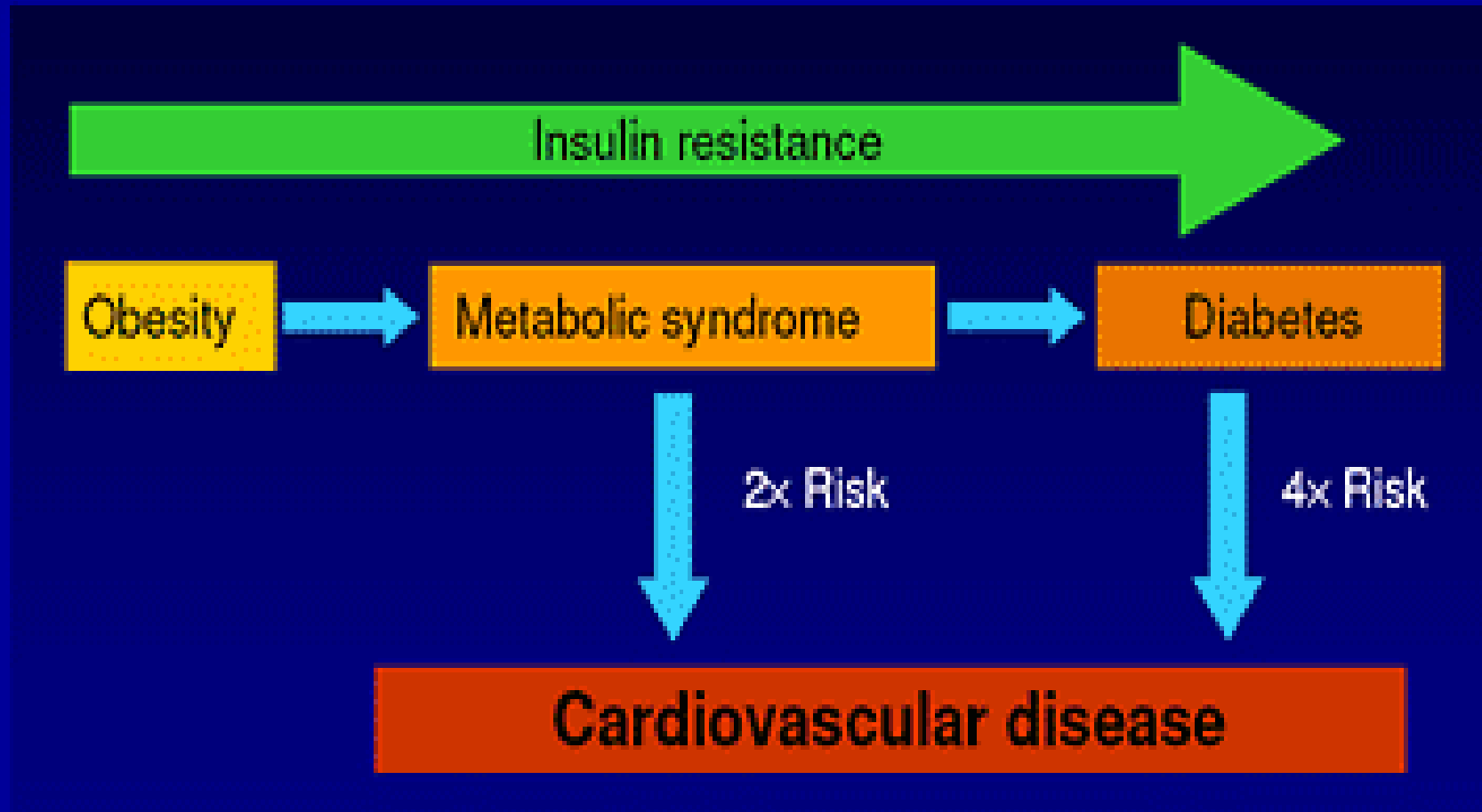


# Obesity is Positively Correlated to Developing of Metabolic Syndrome



**Metabolic Syndrome is about:  
60% in Obese; 22% in Overweight; 5% in Normal Persons**

# Causes of Metabolic Syndrome



Luscher TF, et al. *Circulation*. 2003;108:1655-1661.

Reilly MP and Rader DJ. *Circulation*. 2003;108:1546-1551.

# Current Treatment for Metabolic Syndrome

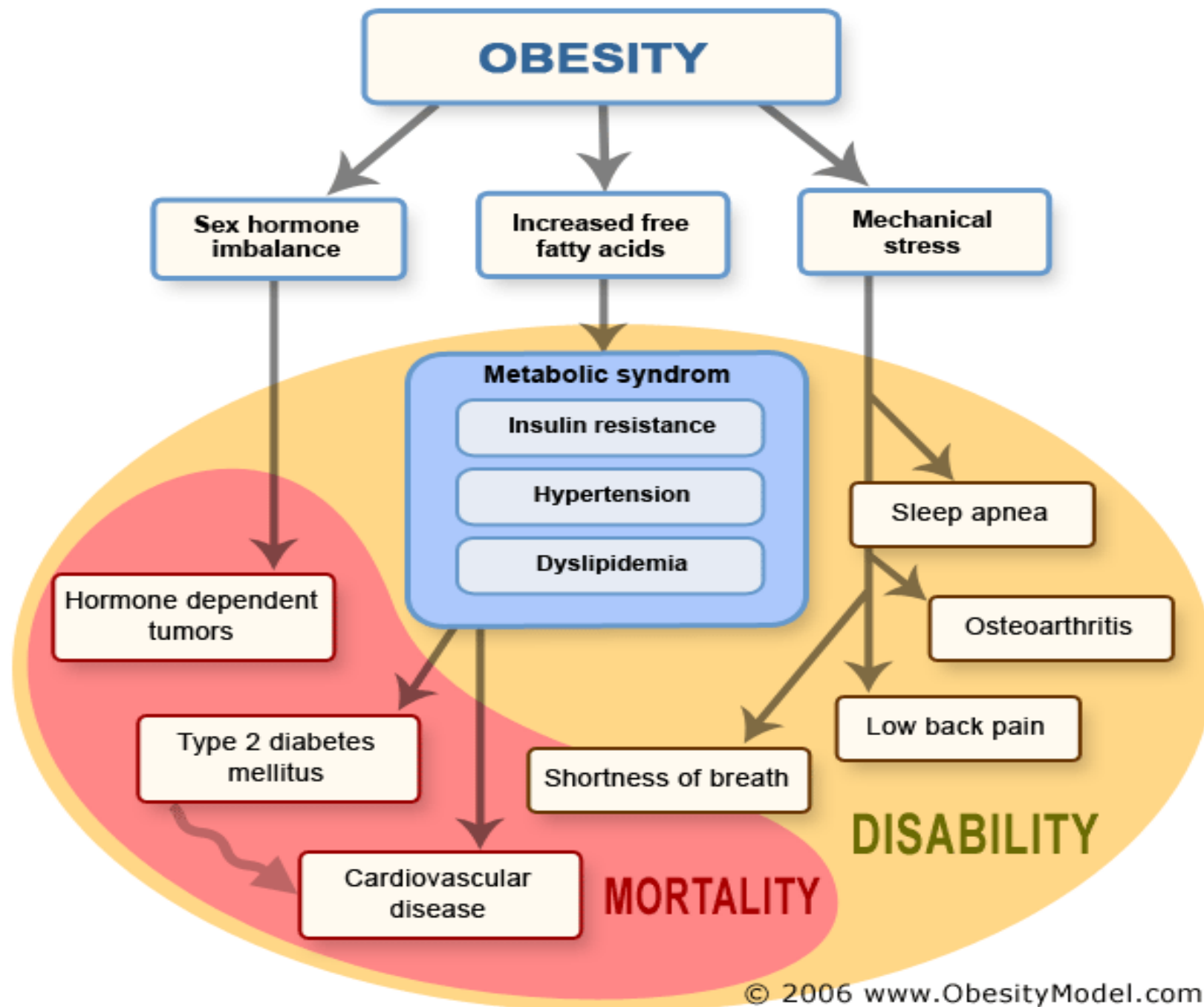
- Focus on treating specific components of MS:
  - Elevated triglycerides
  - Low HDL cholesterol
  - Elevated fasting blood glucose
  - Elevated blood pressure
  - **Obesity**
- Lifestyle modification is preferred long term treatment
- Weight reduction usually requires a specifically tailored combinatorial program
  - Diet, exercise, plus special supplementation

# Overweight & Obesity

## More Than a Beauty Concern



# Obesity is a Health Risk



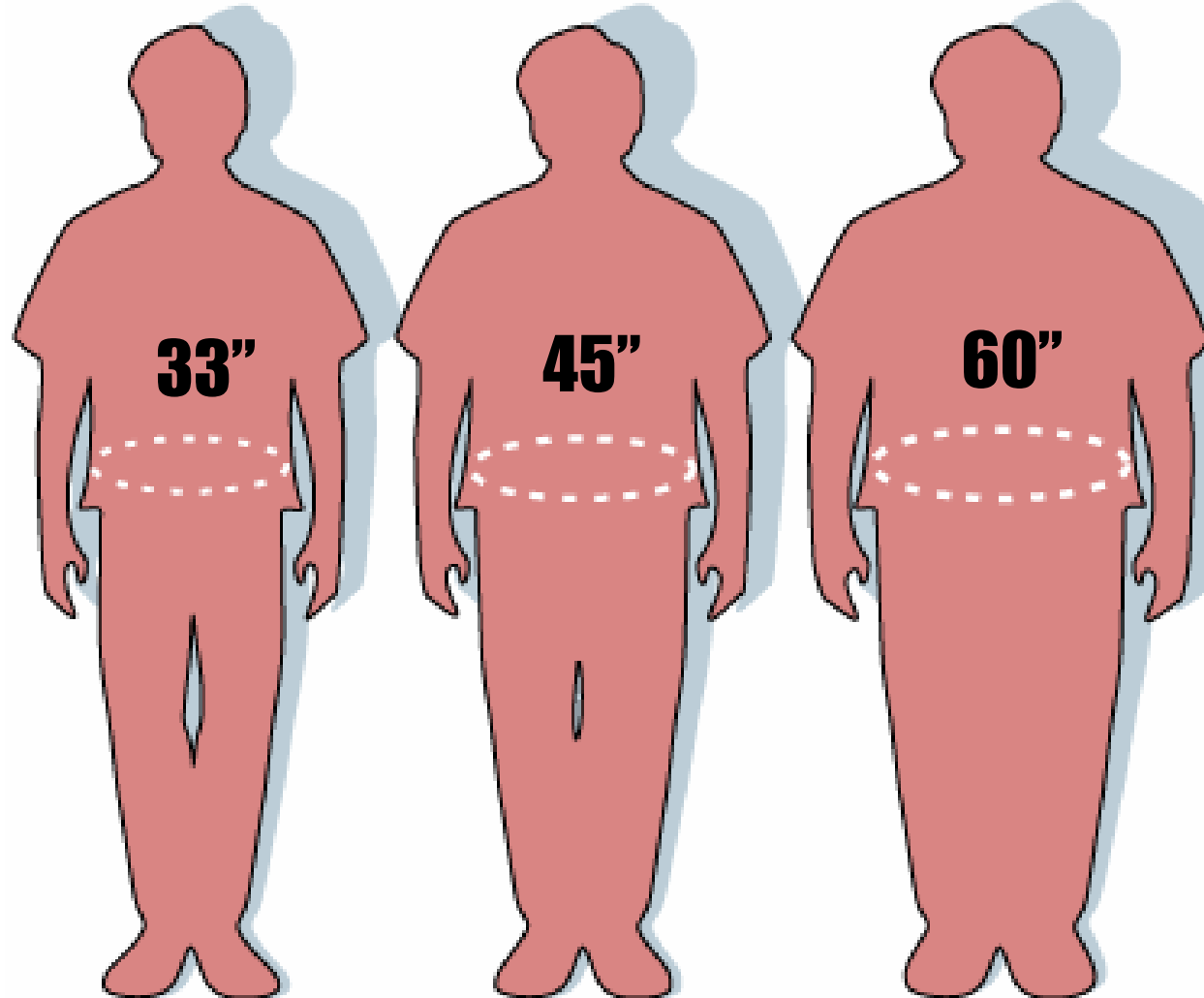


# Abdominal Adiposity – Accurate Indicator of Obesity

**Healthy**

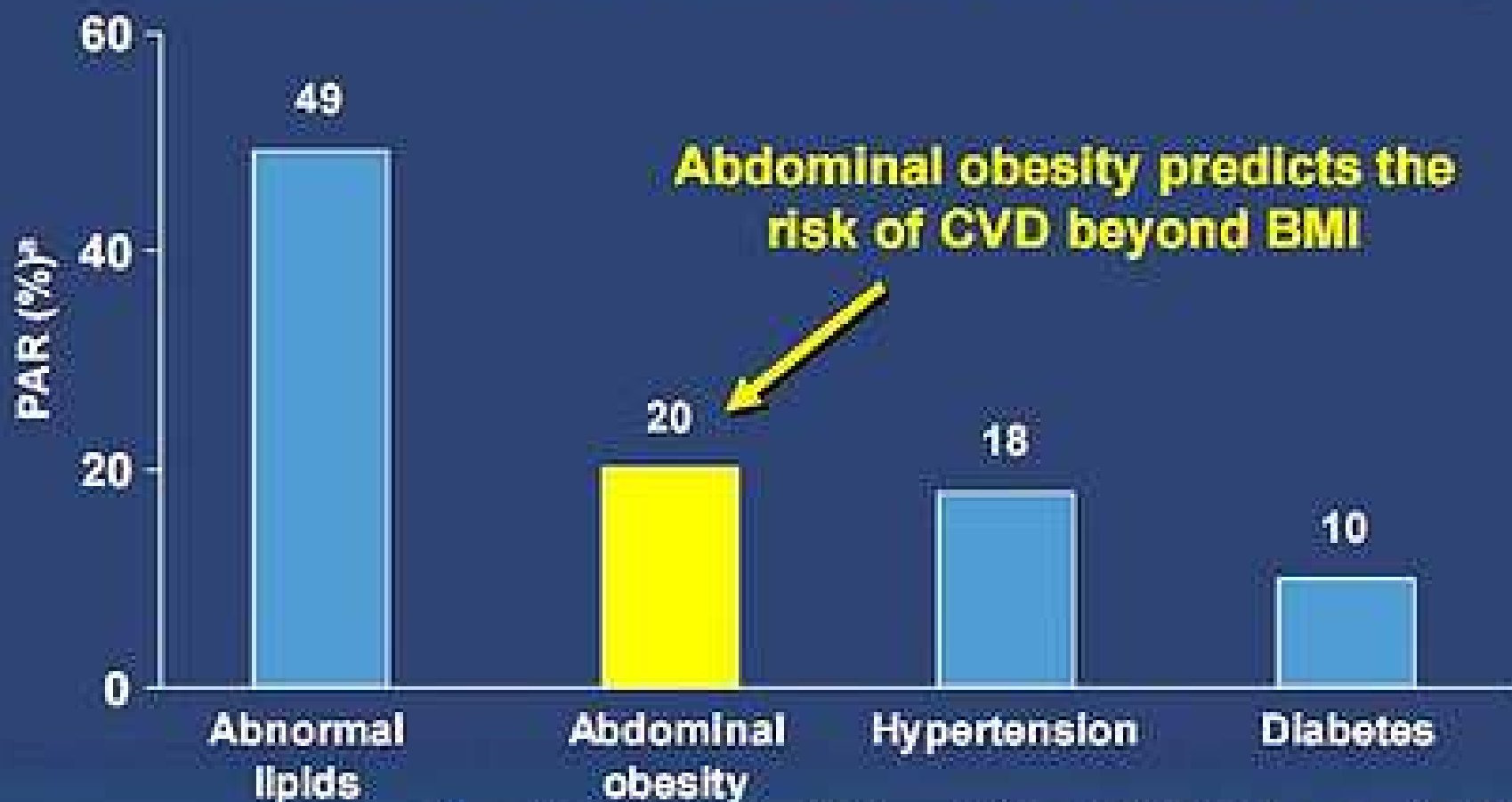
**Overweight**

**Obese**



# Abdominal obesity: a major underlying cause of acute myocardial infarction

Cardiometabolic risk factors in the INTERHEART Study

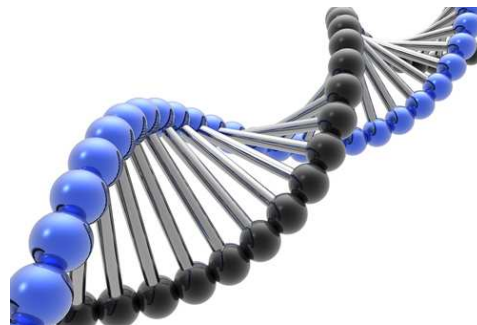


<sup>a</sup>Proportion of MI in the total population attributable to a specific risk factor; CVD: cardiovascular disease; BMI: body mass index; PAR: population attributable risk;

# Causes of Obesity

## Genetic Factors

- People with lower basal metabolic rate
- People born with more fat cells
  - Fat cells multiply twice in your life time



# Causes of Obesity

## Certain Medications

- **Antidepressants drugs**
- **Oral birth control pills**
- **Corticosteroids**
- **Female hormone treatments**
- **Insulin & insulin-stimulating drugs**
  - Conflict of interest for obese individuals with Type 2 diabetes



# Causes of Obesity

## Dietary Habits

- **Night-eating syndrome**
  - No appetite in morning
  - Insomnia
  - Consuming more than  $\frac{1}{2}$  of daily food intake after 6 pm
- **Binge eating & eating disorders**
  - 30% of obese people are binge eaters
  - Consume 5–15 kcal in one sitting



# Treatment of Abdominal Obesity

- **Couple lower calorie diets with regular exercise**
  - All components of metabolic syndrome can be improved with modest amounts of weight loss
- **For those with impaired fasting glucose tolerance**
  - High fiber, low saturated fat diet with increased daily exercise reduce incidence of diabetes by almost 60%.
- **Those who exercise the most, gain the most benefit**

# ***Common Weight Management Approach***

## **Dieting**

### **Core Concept:**

- When take in more calories than you use, the extra energy is stored in body as fat
- Dieting aims to cut or ensure a balanced energy input

### **Challenge:**

- Difficult to achieve healthy diet



# Dietary Types & Risks

## Calorie Restriction

- Extreme diets of fewer than 1,100 calories carry health risks
- Low calorie dieting slows down metabolism, making it more difficult to lose weight

## Low-Carbohydrate Diet

- Can cause excessive calcium excretion in urine
  - Increases risk for kidney stones & osteoporosis

## Low-Fat Diets

- Often not getting enough fat-soluble nutrients
- May increase risk for stroke from hemorrhage in brain

# Who Should be Careful on Dieting:

With serious medical conditions:

- Hypertension
- Diabetes
- Heart disease



Require specialized nutrition:

- Chemotherapy
- Radiation treatment
- Other medical therapies

Women who are pregnant or trying to become pregnant



# Dieting Facts

## Dieting alone is rarely successful & relapse rates are high

- About 90% of people lose weight through dieting gain back their weight



## Nutrigenomic

### Science of personalized nutrition:

- A balanced healthy diet, tailored to individual body needs
- Best way to maintain weight & prevent disease

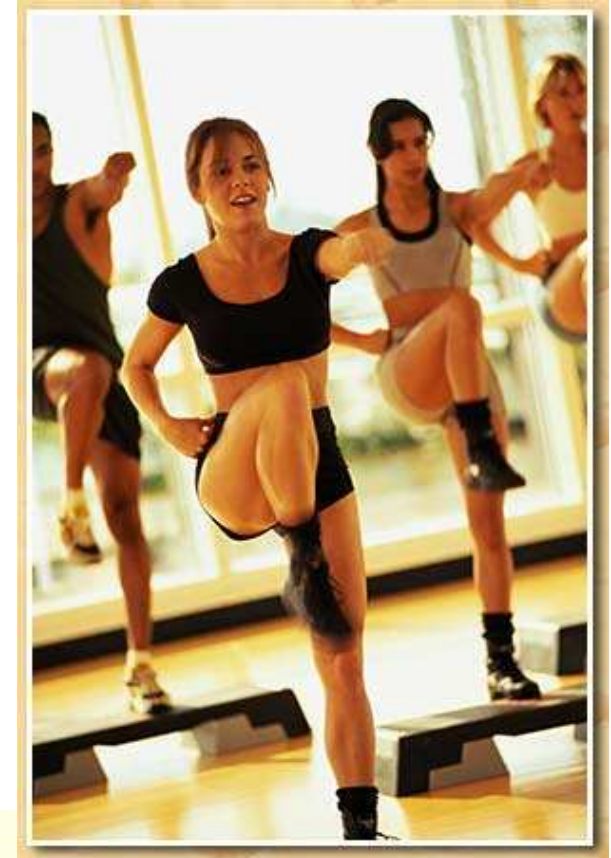


# Common Weight Management Approach

## Exercise

### Core Concept:

- To lose weight, you must burn more calories than you eat
  - Exercise is the best way
- Exercise build stronger muscles
  - Muscles use more calories than fat
    - Higher metabolism



### Challenge:

- Lose weight need intensive exercise
- Intensive exercise is hard work – needs time & discipline

# Oral Drug for Obesity

## Prescription **Fat blocker**

*Orlistat (Xenical™)*

- Inhibit enzyme **lipase**
  - Slowing fat absorption in intestine
- Can cause GI problems, liver damage
- Interfere with absorption of fat-soluble nutrients
- Side effect - leakage of oily stool
- People with bowel diseases should avoid it



# Oral Drug for Obesity

## Prescription **Appetite Suppressant**

*Sibutramine (Meridia™/Reductil™)*

- Acts on the brain chemicals
  - Increase metabolism
  - Causes a feeling of fullness
- **Side effects**
  - Dry mouth, constipation, insomnia, increase heart rate & blood pressure
- **Not suitable for people with hypertension, stroke, or heart disease**



# Oral Drug for Obesity

## Prescription Psycho-stimulants

*Phentermine (Ionamin™, Adipex-P™, Duromine™)*

*Phendimetrazine (Adipost, Bontril, Melfiat, Plegine)*

*Benzphetamine (Didrex™)*

- Acts like stress hormone thus works as appetite suppressant
- Side effects
  - Raise blood pressure & depression
- Not suitable for people with hypertension, stroke, or heart disease
- Only for short-term use of 12 weeks or less



# Over-the-Counter Dietary Aids



## Use Thermogenic (Fat Burner)

- Aloe, green tea, guarana (caffeine), L-carnitine, pantethine, sesamin

## Use Laxative Actions

- Aloe, cascara, castor oil, rhubarb root & senna

## Health Risk:

- Interfere with absorption of foods
- Only for short term use
- Can cause gastrointestinal distress
- May lead to chronic pain, constipation, electrolyte imbalance & dependency



# Other Over-the-Counter Dietary Aids

## Slow fat production

- Hydrocitric acid (HCA) a lipogenesis inhibitor
  - Slows down fat synthesis & reduce appetite

No recommended without medical supervision

Not for long term use

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## Block fat from being absorbed

- Chitosan (or chitin - substance found in exoskeleton of shrimp & other shellfish)

Can cause GI problems

Interfere with absorption of fat-soluble nutrients

Not for long term use



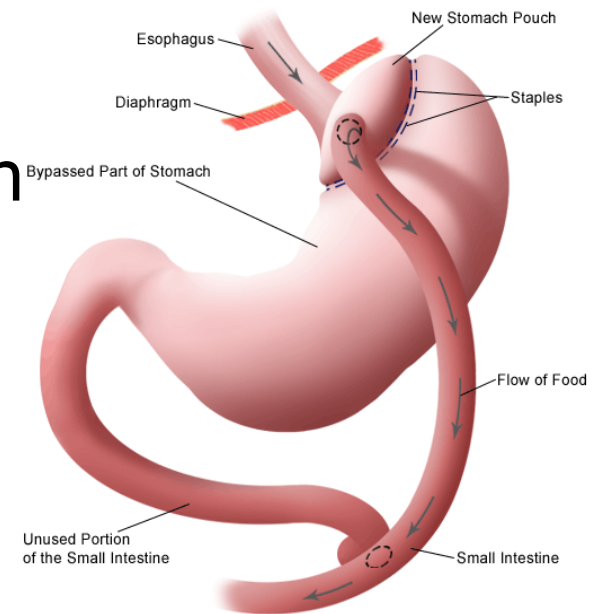
# Surgery

## Gastric bypass

- Alter process of absorption & digestion
  - Person with a BMI > 40
  - BMI >35 with life-threatening health problems

Serious dietary restrictions

Can't handle high-fat & high-sugar food



## Gastric lap-band

- Create a small pouch in top portion of stomach
- Same acceptance criteria as gastric bypass

Nausea, vomiting, abdominal pain, heartburn & slippage of band



# Recommendations

- **Exercise**

- Walk 30 min a day, 5 times a week
  - Low impact exercise
- Increase muscle bulks
  - Don't over work the muscles

- **Diet**

- Eat regular meals
  - 70% full
  - Don't skip breakfast
  - No carbohydrates after dinner
- Balanced diet in every meal
  - Poor nutrition increase appetite



A tropical beach scene with a clear blue sky, scattered white clouds, and a line of palm trees on a sandy shore. The foreground shows shallow, clear water with visible sand patterns on the bottom.

**Thank You**