Epidemiology of Obesity

- Obesity is excessive fat accumulation in adipose tissue to the extent that it can affect health
- When a person is "overweight", it means that they have more body fat than they need for their body to function.
- Weight ranges are greater than what is generally considered healthy for a given height
- Such ranges of weight increase the likelihood of certain diseases and health problems

- **Body Mass Index (BMI):**
  - Calculated from a person's weight and height.
  - Reliable indicator of body fatness for most people.
  - Inexpensive & easy-to-perform screening for weight categories that may lead to health problems.
  - **Does not measure body fat directly, but correlates to direct measures of body fat like:**
    - Skin fold thickness
    - Underwater weighing
    - Dual energy x-ray absorptiometry (DXA)
    - Alternative for direct measures of body fat
  - **At the same BMI :**
    - Women tend to have more body fat than men.
    - Older people tend to have more body fat than younger adults.
    - Highly trained athletes may have a high BMI because of <u>increased muscularity</u> rather than increased body fatness.

  - **Obesity classification according to BMI:**

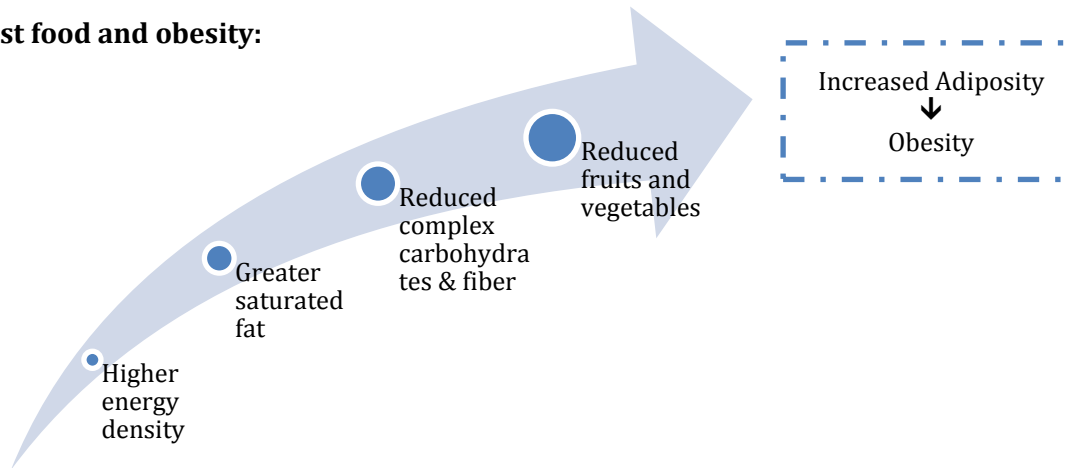| < 18.5	18.5-24.9	25.0-29.9	≥ 30
Underweight	Healthy Weight	Overweight	Class I : 30.0-34.9 Class II : 35.0-39.9 Class III : ≥ 40.0

- **Why is obesity accelerating in developing countries?**
  - Increased consumption of energy dense, nutrient poor foods.
  - Reduced physical activity.

- **Prevalence of Obesity in Saudi Arabia:**
  - Adult Males is 26.4 % of total population (7th rank in highest obesity rankings).
  - Adult Females is 44.0 % of total population (2nd rank in highest obesity rankings).

- **Causes of Obesity: (Not necessarily overeating)**
  - Eating patterns and environment.   -Food availability and packaging.
  - Physical inactivity.   -Body image.   -Basal body temperature.
  - Dietary thermogenesis.   - Biochemical differences.   -Fidgeting.
  - Quantity & sensitivity to satiety hormones (*leptin):*
    - Hormone that influences the appetite control in the hypothalamus.
    - There is a role of a mutant "obese" gene in obesity development.
  - Genetics: Largest transmissible variation is cultural (discussed below).
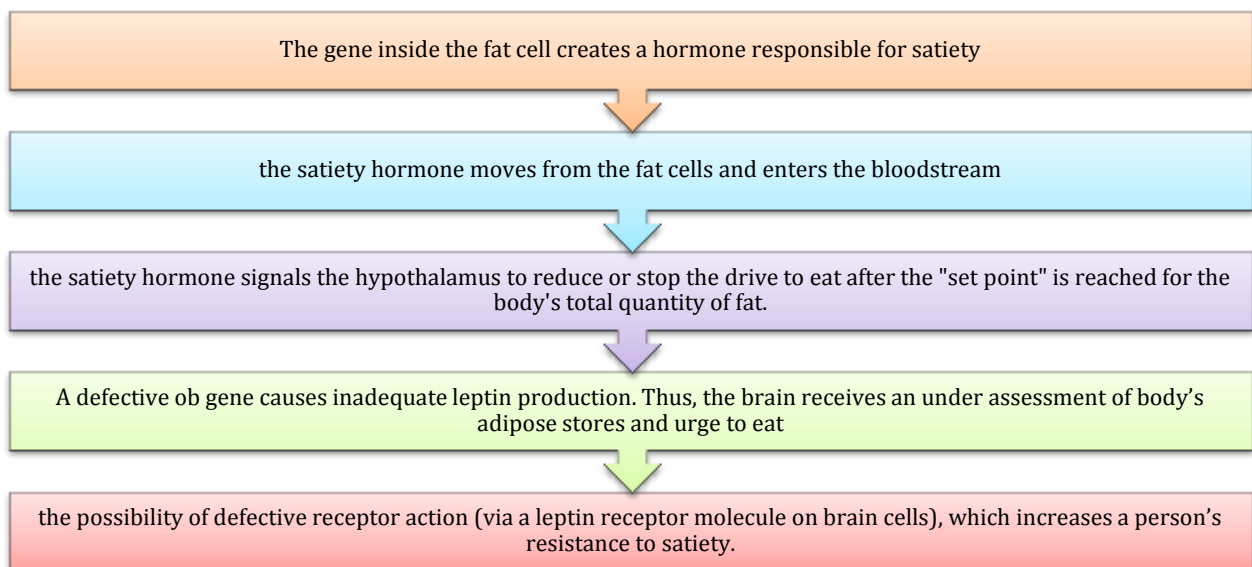
- **Fast food and obesity:**

Higher energy density → Greater saturated fat → Reduced complex carbohydrates & fiber → Reduced fruits and vegetables

Increased Adiposity
↓
Obesity

- **Notes:**
  - For young & middle aged men, physical activity relates inversely to body fat levels.
  - No relationship between caloric intake and body fat levels.

- **Role of Genetics in obesity:**

The gene inside the fat cell creates a hormone responsible for satiety

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the satiety hormone moves from the fat cells and enters the bloodstream

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the satiety hormone signals the hypothalamus to reduce or stop the drive to eat after the "set point" is reached for the body's total quantity of fat.

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A defective ob gene causes inadequate leptin production. Thus, the brain receives an under assessment of body's adipose stores and urge to eat

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the possibility of defective receptor action (via a leptin receptor molecule on brain cells), which increases a person's resistance to satiety.

- **Complications of obesity:**
  - Obesity is a long term process.
  - Obesity frequently begins in childhood.
  - Obese parents likely have overweight children.
  - Regardless of final body weight as adults, overweight children exhibit more illnesses as adults than normal kids.
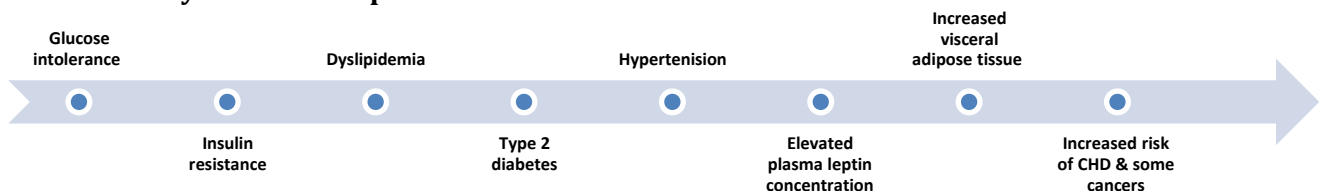
- **Visceral Vs. Peripheral Obesity:**

Visceral	Peripheral
Large amount of Visceral fat	Small amount of Visceral fat
Apple-shaped	Pear-shaped
Upper body obesity	Lower body obesity
WHR: F > 0.8 , M >1.0	WHR: F < 0.8 , M <1.0

WHR = Waist/Hip ratio

- **Degree of abdominal fat accumulation is correlated with increased risk of:**
    o Cardiovascular disease
    o Type 2 diabetes
    o Premature death
    o Some types of malignancies

- **Obese Syndrome Components:**

Glucose intolerance — Insulin resistance — Dyslipidemia — Type 2 diabetes — Hypertenision — Elevated plasma leptin concentration — Increased visceral adipose tissue — Increased risk of CHD & some cancers

- **10kg Weight Loss in 100kg Patient:**

Deaths
- 20-25% fall in total mortality
- 30-40% fall in diabetes related deaths
- 40-50% fall in obesity related cancer deaths

Blood Pressure
- 10mm/Hg fall in both systolic and diastolic values

Diabetes
- Reduces the risk of developing diabetes by >50%
- 30-50% fall in fasting glucose
- 15% fall in HbAIC

Lipids:
- 10% fall in total cholesterol
- 15% fall in LDL and 30% fall in triglycerides
- Increase of 8% in HDL

- Obesity is affected by a complex interaction between the environment, genetic predisposition, & human behavior.
- It has increased risk of numerous chronic diseases, from diabetes and cancers to many digestive diseases.
- The problem of overweight and obesity is one of the most pressing global issues with massive health care cost.
- Demands attention from the healthcare community, researchers, and policy makers.

Approach to Obesity

Clinical Level

- A full history with a dietary inventory and an analysis of the subject's activity level.
- Screening questions to exclude depression.
- Screening for eating disorders as 30% of patients suffer from them.
- Determine any co-morbidities.
- Exclude the possible and rare secondary causes.
- Requirements of treatment and belief to fulfill.
- Behavior assessment for readiness.
- Family support, time and financial considerations.

Community Level

- Empowering parents, and caregivers.
- Healthy foods in schools & restaurants.
- Access to healthy affordable food.
- Avenues for physical activity.
- Safe neighborhoods; playgrounds, parks.
- Physical education in schools/child care facilities.
- Encourage breast feeding.
- Farmers markets; local fruits and vegetables available.
- Any barriers considered.

Epidemic Level

- Early recognition & awareness.
- Prompt action by individuals, parents, families physicians, communities & others.
- Policies for conducive Environment.
- Increased physical activity in all age groups.
- Nutrition: Breast feeding & dietary determinants.
- Behavior modifications at all levels, and by all health seekers and health providers.
- Behavioral surveillance programs to detect changes.
- Research at basic, clinical, and public health levels.

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💗 GOOD LUCK 💗