

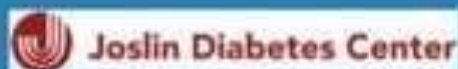
Obesity

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Questions & ILOs

1. How the body regulates **appetite**?
2. **Classification** of overweight and Obesity
3. What are the obesity related **complications**?
4. What are the criteria of metabolic syndrome according to ATP III-NCEP and IDF?

History of obesity!



What happened to our food?



At the same time



Food & Culture

Indian Food



Filipino food



Syrian Food



Egyptian Food



Kushari

Saudi Food



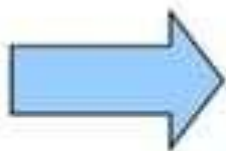
Saudi traditional Food



History of Human body build

- For centuries the human race struggled to overcome **food scarcity**, disease
- Historical records from developed countries indicate that weight and height increased progressively **during the 19th century**.
- By 1930s the **life insurance companies** were already using body weight data to determine premiums.

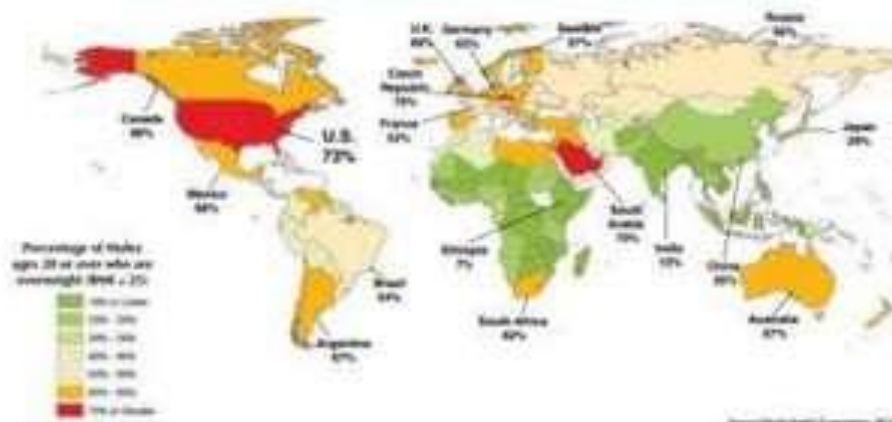
What happened to our sleep?



Global obesity epidemic

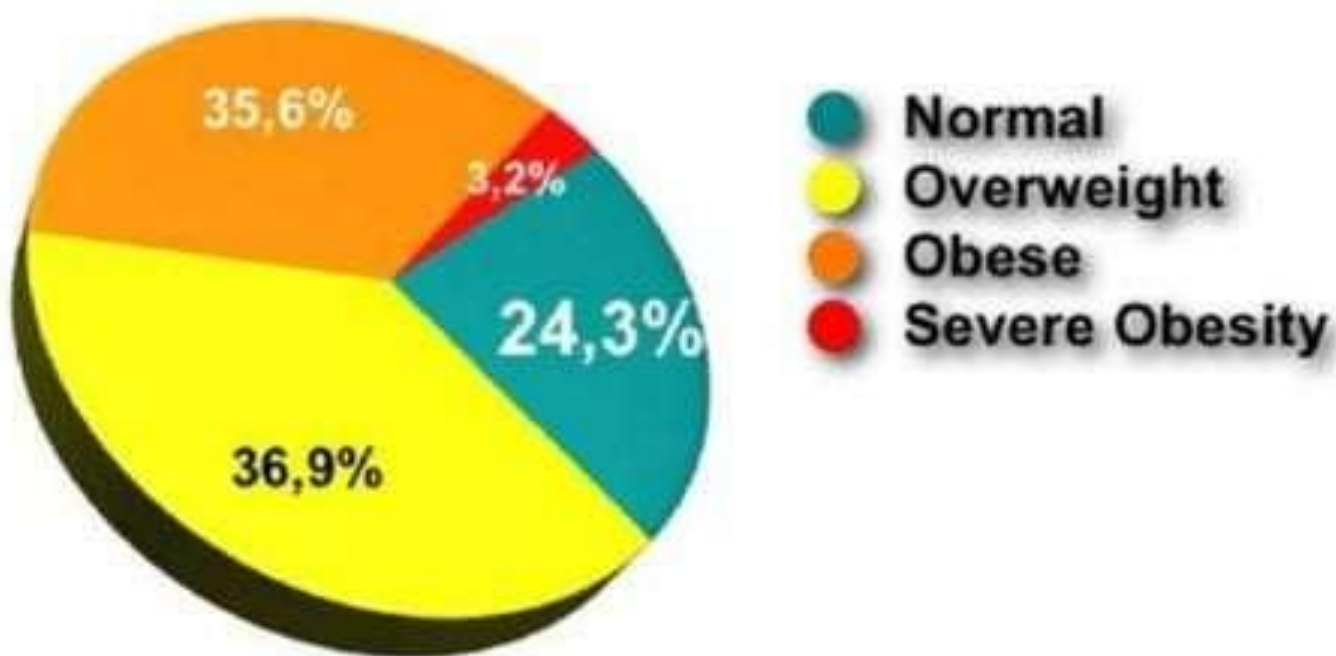
- Affecting both developed and developing countries
- Increasing rate

Almost 3 out of 4 adult American males are overweight or obese. The United States has the highest rate of overweight males among all major countries.





Prevalence of obesity in Saudi Adults



Socioeconomic impact of obesity

- Obesity is a **nutritional problem** and lifestyle dependent disease
- It affects **poor individuals** as rich or even more in some studies
- It **impacts the individual's income** & whole productivity of the community
- **Urbanization** is associated with increased obesity

Childhood Obesity

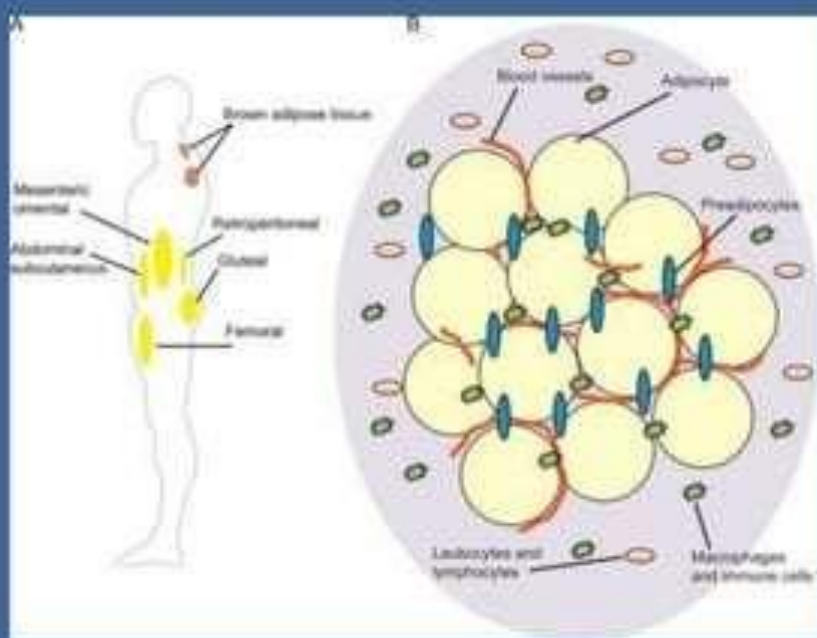
- In united states around 20% and worldwide at least 10%
- KSA 11.3 % in age 5-12 and up to 13.8% in age 13-18 years
- Exclude *secondary cause* (genetic syndromes, endocrine, drugs)
- For childhood obesity, the goal is to reduce the rate of weight gain to fit the profile expected based on normal growth curves. The intent here is not to cause weight loss.

Is Obesity a disease ?

- Yes
- In 2012 by AACE
- It is a **chronic disease**
- This declaration will help combating obesity related complications

Adipose tissue

- Classical functions
- Endocrine function
- Peripheral and central fat



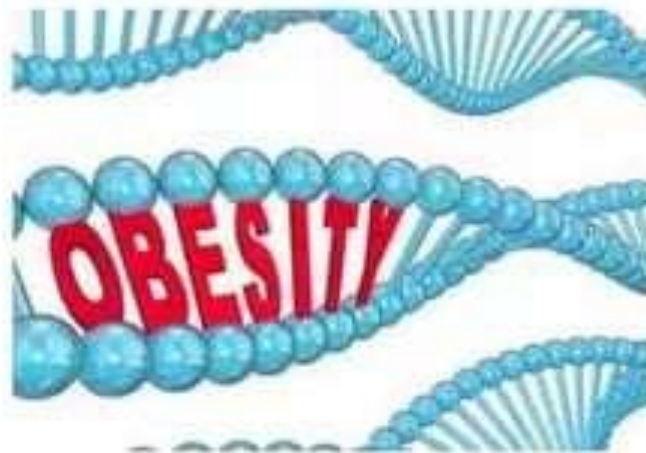
Aetiology of Obesity?

1. Genetic factors
2. Environmental factors



Genetic factors

- Polygenic
- Leptin related genes and others
- 40–70% of obesity may be explained by genetic influences



Environmental factors

- sedentary life
- Chronic ingestion of excess calories
- Psychological
- Socioeconomic



Potentially reversible causes of obesity

Endocrine factors

- Hypothyroidism
- Cushing's syndrome
- Insulinoma
- Hypothalamic tumours or injury

Drug treatments

- Atypical antipsychotics (e.g. olanzapine)
- Sulphonylureas, thiazolidinediones, insulin
- Pizotifen
- Glucocorticoids
- Sodium valproate
- β -blockers

Appetite Regulation



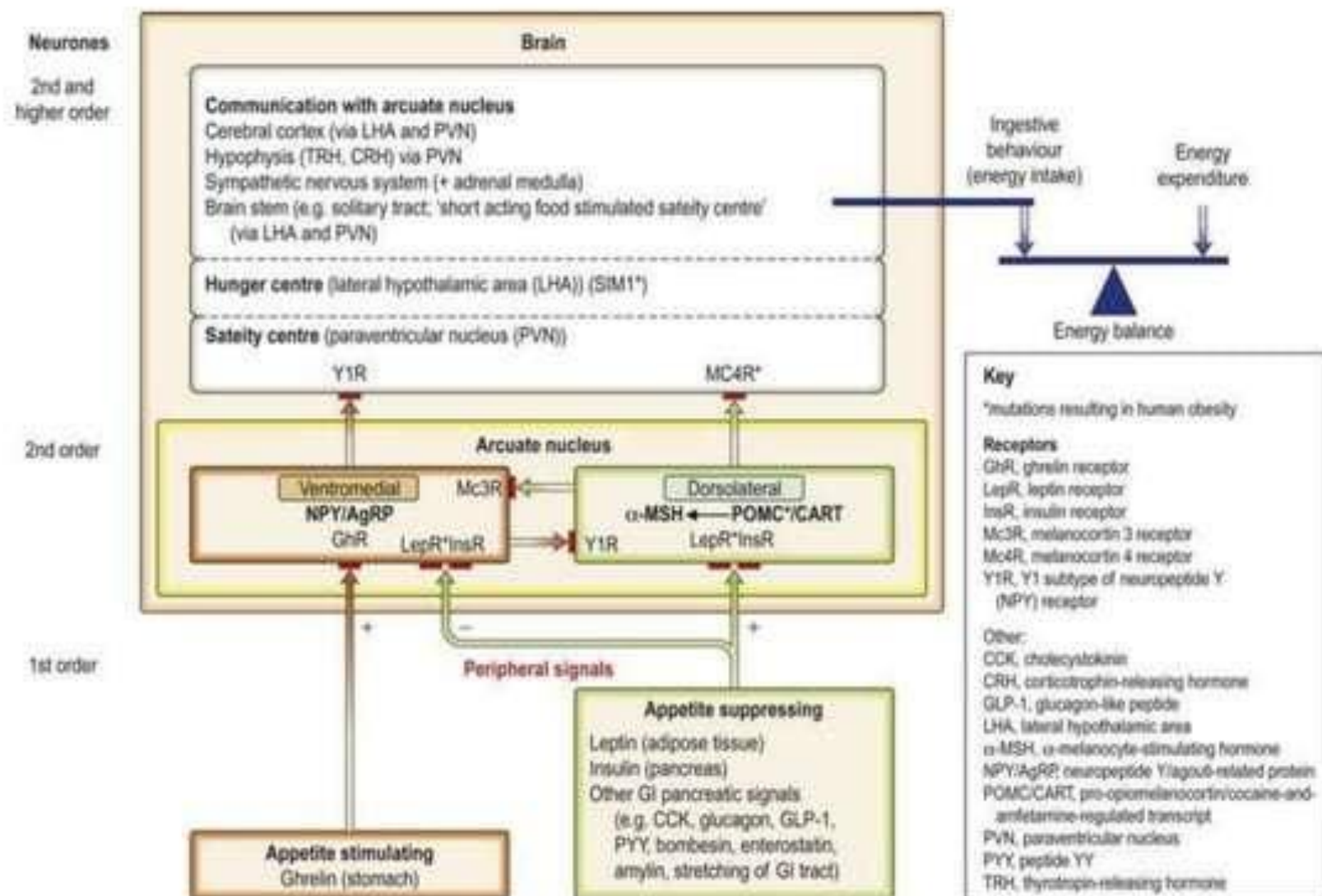
Energy balance

- The body requires energy **to support** normal functions and physical activity, growth, and repair of damaged tissues.
- **Energy is provided by** oxidation of dietary protein, fat, carbohydrate.
- Balance between intake and expenditure

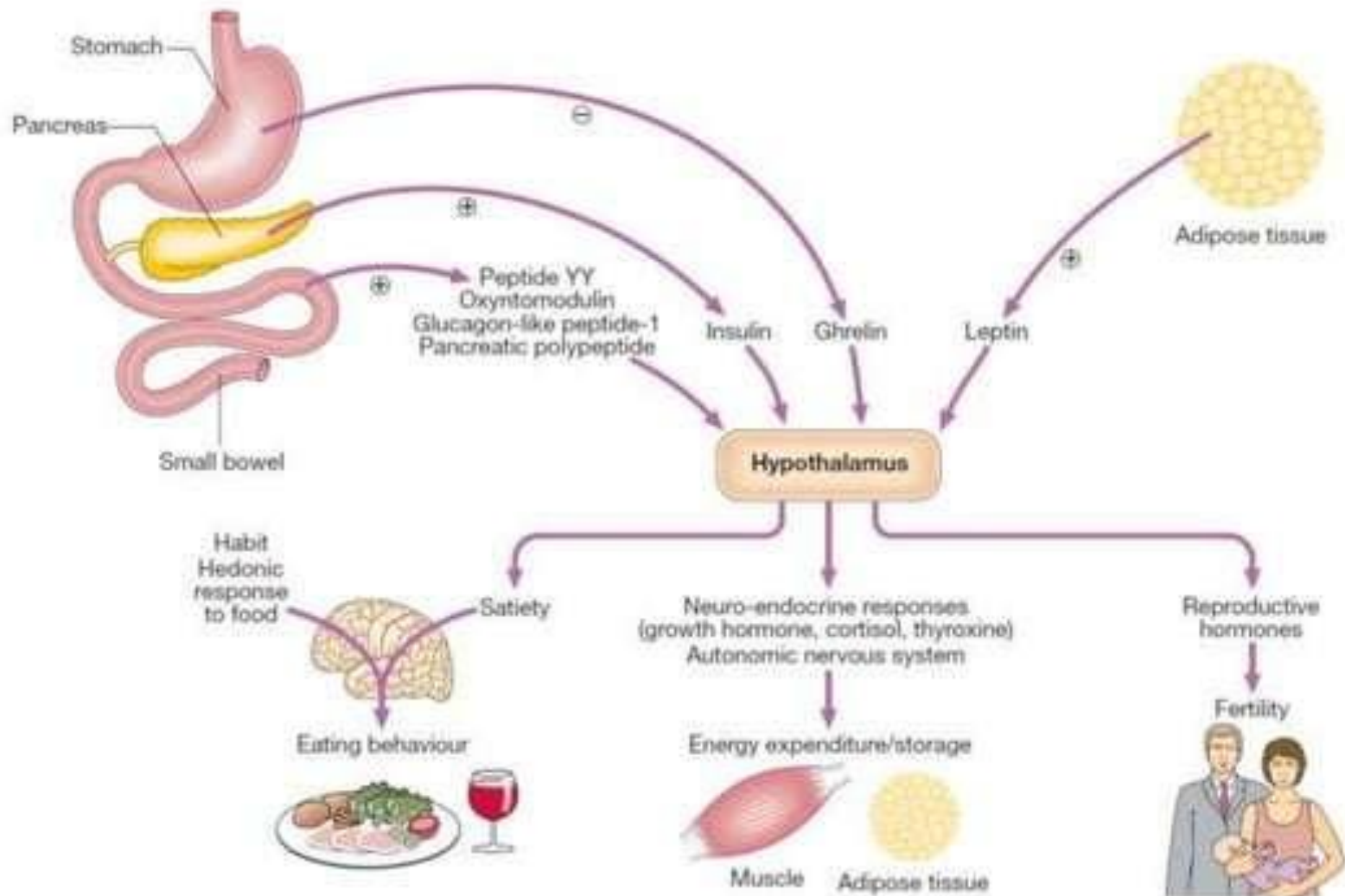
Satiation, Satiety & Hunger

- **Satiation** is the level of fullness during a meal, which regulates the amount of food consumed while **satiety** is the level of hunger after a meal is consumed, which regulates the frequency of eating

Control of Food intake & appetite

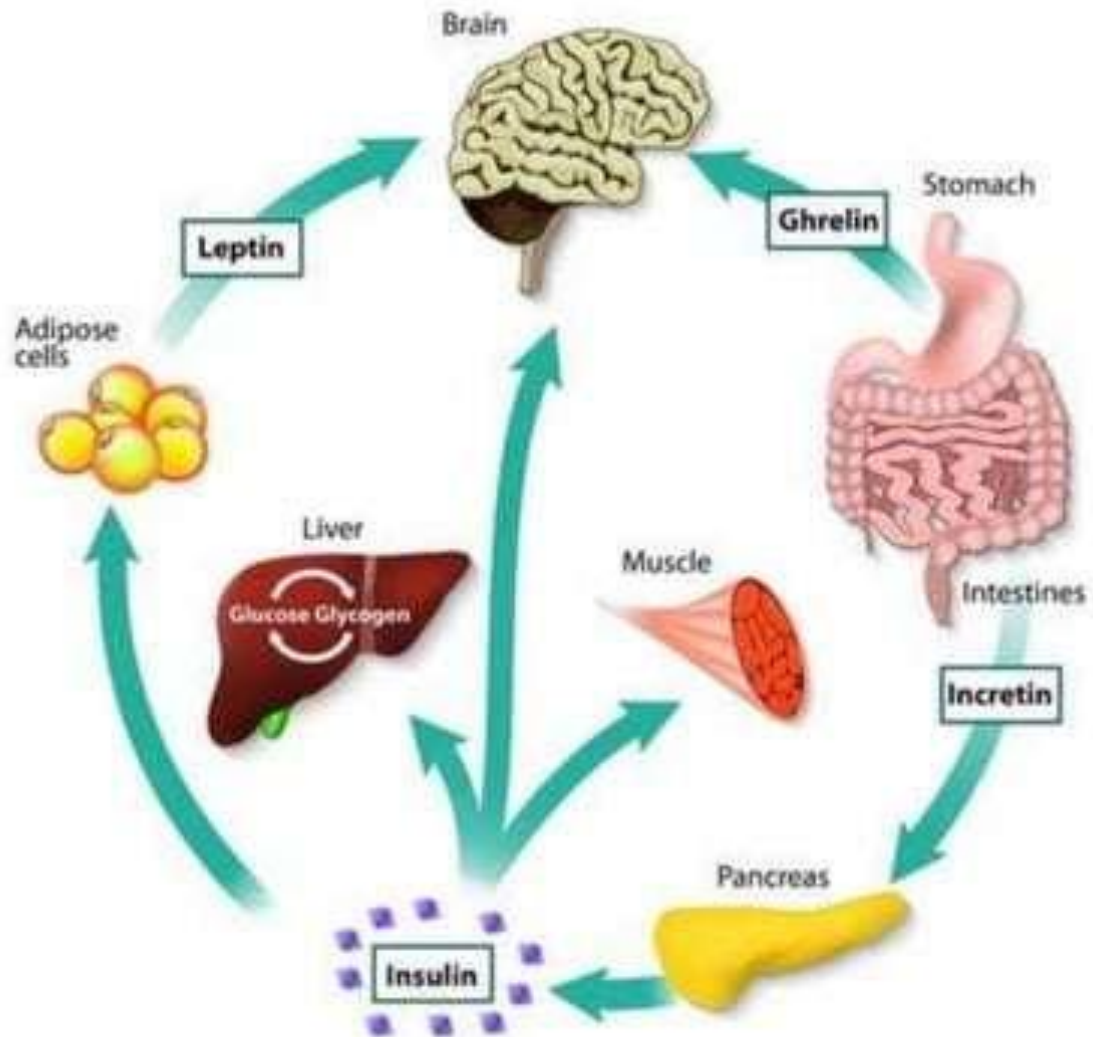


Regulation of energy balance



APPETITE & HUNGER

(hormones)



Leptin Hormone

- Satiety hormone
- Secreted from fat
- It is increased with increase amount of body fat
- Leptin resistance
- Leptin deficiency

Ghrelin Hormone

- **Hunger** hormone
- Orexogenic
- Secreted from the stomach
- Acts on hypothalamus
- Increases Growth hormone
- Ghrelin increased after Diet induced weight loss but decreased with gastric bypass

Classification of overweight & obesity



Measurements of Obesity

- Body mass index
- Waist circumference
- Waist/hip circumference
- Body composition

body fat



Triceps skinfold thickness. Lean patients 6–12 mm; obese patients 40–50 mm.



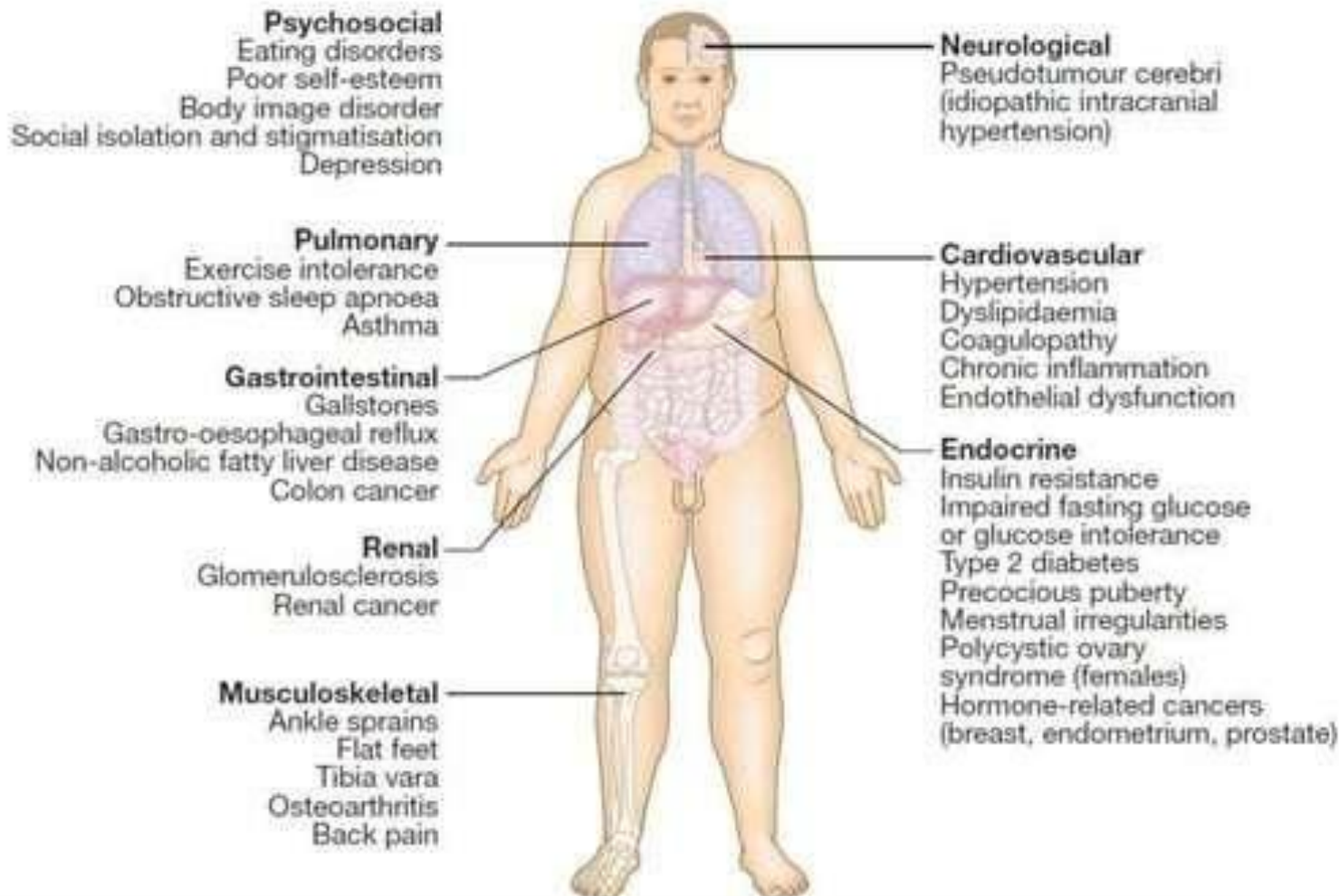
Classifications of Overweight & Obesity

WHO classification	BMI (kg/m ²)	Risk of co-morbidities
Overweight	25–30	Mildly increased
Obese	>30	
Class I	30–35	Moderate
Class II	35–40	Severe
Class III	>40	Very severe

Obesity Related complications



Complications of Obesity



Obesity related increased risk

1. Metabolic syndrome
2. Hypertension
3. Type 2 diabetes
4. Dyslipidemia
5. Cardio-vascular disease
6. Thromboembolic disorders
7. Liver disease including cancer
8. Gall bladder disease
9. Kidney diseases
10. Pulmonary disease and sleep apnea
11. Increase surgical and obstetric risk
12. Endocrine abnormalities
13. Major depression and binge eating disorder
14. Colon, ovarian and breast cancers
15. Degenerative joint disease
16. Skin disorders

Metabolic syndrome



Metabolic syndrome

Risk factor	ATP III NCEP (any 3 of 5 features)	IDF (large waist + 2 features)
Waist circumference		
Men	>102 cm (40 in)	>94 cm (37 in)
Women	>88 cm (35 in)	>80 cm (35 in)
Triglycerides	>1.7 mmol/L (150 mg/dL)	≥1.7 mmol/L (150 mg/dL)
HDL cholesterol		
Men	<1.03 mmol/L (40 mg/dL)	<1.03 mmol/L (40 mg/dL)
Women	<1.29 mmol/L (50 mg/dL)	<1.29 mmol/L (50 mg/dL)
Blood pressure	>130/85 mmHg	>130/85 mmHg
Fasting glucose	≥6.1 mmol/L (110 mg/dL)	≥5.6 mmol/L (100 mg/dL)



Management



Diet

- Low calorie diet plans
- Balanced diet
- Different types of Diet plans

Exercise

- Aerobic exercise directly increases the daily energy expenditure and is particularly useful for long-term weight maintenance
- Combination of **different types** of exercise

Key recommendations for healthy diet

- limit the intake of saturated fat, trans fat, cholesterol, added sugars, salt
- Balance calories intake with calories expended
- Engage in regular physical activity
- Up to 9 servings per day and more varieties of fruits and vegetables per day
- Whole grains
- Consume 3 cups per day of low fat milk or milk products
- Use little added sugars or caloric sweeteners
- Consume less than 2300 mg of sodium per day; and prepare food safely

Drug treatment of Obesity

- No magic tablet for obesity until now
- Orlistat (inhibits pancreatic lipase)
- Sibutramine (withdrawn)
- Rimonabant (withdrawn)
- Bupropion
- GLP-1 analogues

GLP-1 agonists



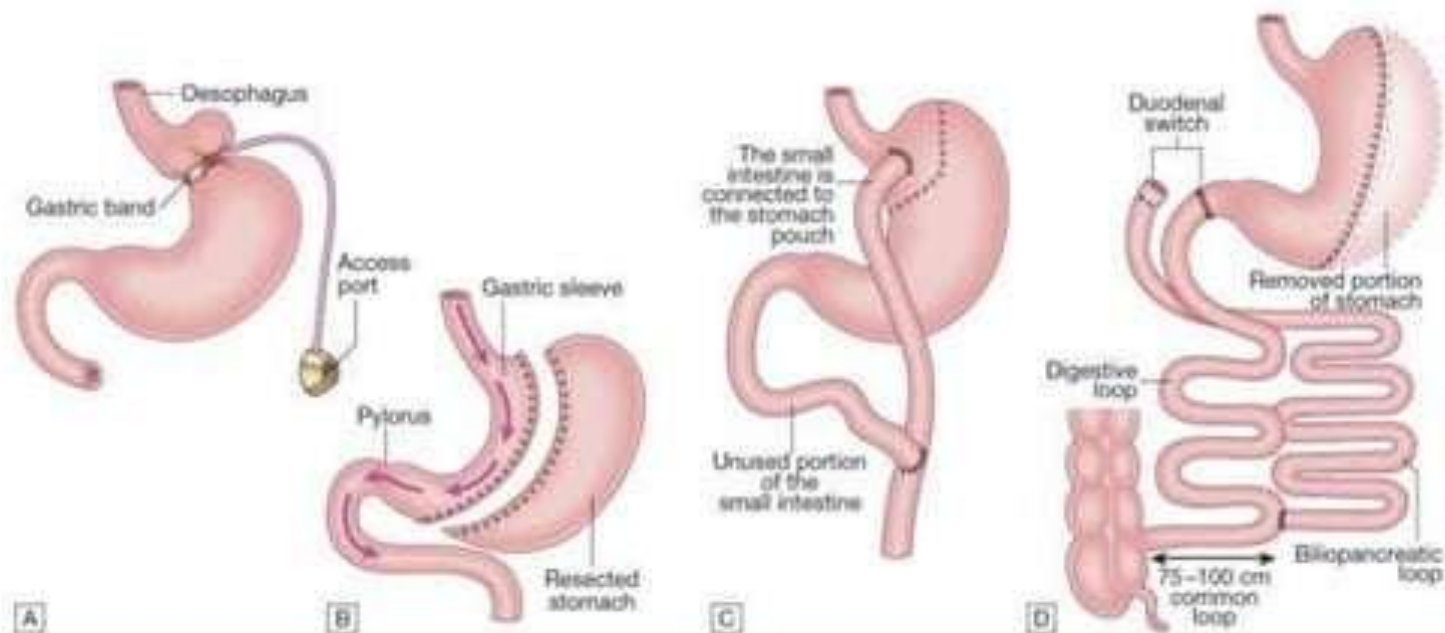
- (once weekly dosing)
- QW Exenatide (Bydureon[®]) FDA approved 2012
 - Albiglutide (Tanzum[®]) FDA approved 2014
 - Dulaglutide (Trulicity[®]) FDA approved 2014



When bariatric surgery can be done?

- Patients with morbid obesity (BMI >40 kg/m²),
- Patients with a BMI >35 kg/m² and obesity-related complications
- After conventional medical treatments have failed.
- It can be used as a first-line option for individuals with a BMI >50 kg/m².
- Fitness for surgery should be checked

Bariatric Surgery



Effectiveness of Bariatric surgeries

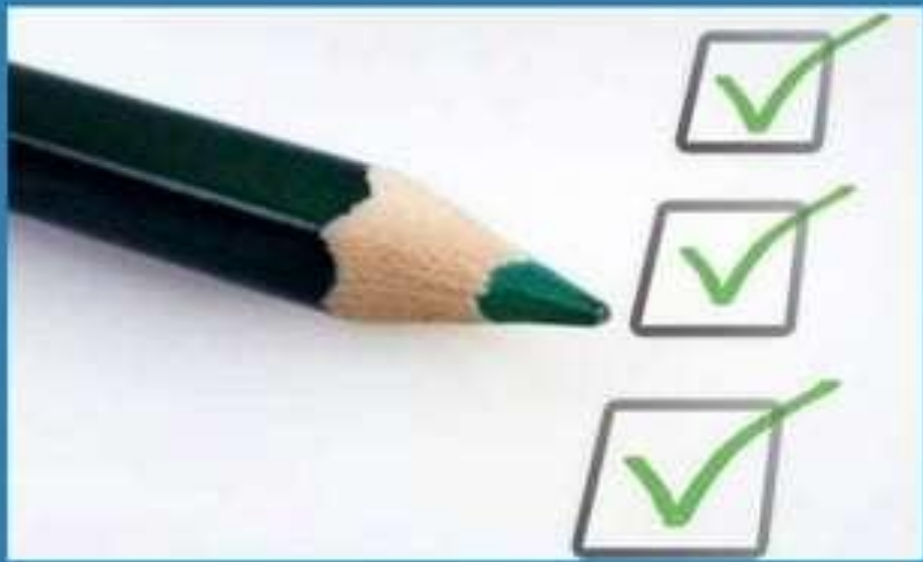
Procedure	Expected weight loss (% excess weight)	Adverse effects
Gastric banding	50-60%	Band slippage, erosion, stricture Port site infection Mortality <0.2% in experienced centres
Sleeve gastrectomy	50-60%	Iron deficiency Vitamin B ₁₂ deficiency Mortality <0.2% in experienced centres
Roux-en-Y gastric bypass	70-80%	Internal hernia Stomal ulcer Dumping syndrome Hypoglycaemia Iron deficiency Vitamin B ₁₂ deficiency Vitamin D deficiency Mortality 0.5%
Duodenal switch	Up to 100%	Steatorrhoea Protein-calorie malnutrition Iron deficiency Vitamin B ₁₂ deficiency Calcium, zinc, copper deficiency Mortality 1%

Complications of weight loss

- Cholelithiasis
- Arrhythmia
- Electrolyte imbalance
- Hyperuricemia
- Psychological conditions



Take home message



Remember

- ✓ Genetic and environmental factors interplay in obesity
- ✓ Always exclude **secondary cause** of obesity
- ✓ Obesity is a disease with complications
- ✓ Obesity is increasing pandemic in both poor and rich
- ✓ No magic drug for obesity
- ✓ Weight loss may have some complications but has a lot of health benefits.



THANK
YOU