CHRONIC

DISEASES

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Hypertension

ضغط الدم

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Hypertension

Hypertension is a chronic condition of concern due to its role in the causation of coronary heart disease, stroke, and other vascular complications.

It is the commonest *cardiovascular disorder*, posing a major public health problem.

It is one of the major risk factors for cardiovascular mortality.

Top leading causes of death globally (2022)

- **Heart disease**
- Cancer
- Accidents (unintentional injuries)
- Stroke (cerebrovascular diseases)
- Chronic lower respiratory diseases
- Alzheimer's disease
- Diabetes

The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC 7) (2003)

Classification	SBP (mm Hg)	DBP (mm Hg)
Normal	<120	and <80
Prehypertension	120-139	and <80
Stage 1 hypertension	140-159	or 80-89
Stage 2 hypertension	≥160	≥90

Hypertension

JNC 7 suggests that all people with hypertension (Stages 1 and 2) be treated

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Hypertension

The classification is based upon intervention trials which included only adults aged 18 years or older.

Definition and classification of hypertension refers to adults not taking anti-hypertensive drugs and not actually ill, and based on the average of two or more readings on two or more occasions after initial screening.

Hypertension

When systolic and diastolic pressure fall into different categories, the higher category should be selected to classify the individual's blood pressure.

Isolated systolic hypertension is defined as a systolic blood pressure of 140 mmHg or more and a diastolic blood pressure of less than 90 mmHg.

Hypertension

Hypertension is divided into primary (essential) and secondary.

Hypertension is classified as “essential” when the causes are generally unknown.

Essential hypertension is the most prevalent form of hypertension accounting for 90 per cent of all cases of hypertension

Hypertension

INCIDENCE

The concept of incidence has limited value in hypertension because of the variability of consecutive readings in individuals, ambiguity of what is “normal” blood pressure and the insidious nature of the condition

Risk factors for Hypertension

Hypertension is not only one of the major risk factors for most forms of cardiovascular disease, but that it is a condition with its own risk factors.

Based on a W.H.O Scientific Group report the risk factors for essential hypertension may be classified as follows:

Non-modifiable risk factors

A- AGE

- Blood pressure rises with age in both sexes.
- Age probably represents an accumulation of environmental influences and effects of genetically programmed senescence الشيخوخة in body systems

Non-modifiable risk factors

B- GENETIC FACTORS

- There is considerable evidence that blood pressure levels are determined in part by genetic factors.

- The evidence is based on twin and family studies.

Non-modifiable risk factors

C- ETHNICITY

- Population studies have consistently revealed higher blood pressure levels in black communities that other ethnic groups.

Modifiable risk factors

A- OBESITY

- Epidemiological observations have identified obesity as a risk factor for hypertension.

- The greater the weight gain the greater the risk of high blood pressure.

- Data also indicate that when people lose weight their blood pressure generally decreases.

Central obesity indicated by increased

WAIST / HIP ratio

has been positively correlated with high blood pressure in several populations

Modifiable risk factors

B- SALT INTAKE

There is increasing evidence to the effect of high salt intake (7- 8 gm/ day) increases blood pressure proportionately.

The higher incidence of hypertension is found in **JAPAN**, where the sodium intake is above 400 mmol/**day** (7 gm).

It has been postulated that essential hypertensives have a genetic abnormality of the kidney which makes salt excretion difficult.


EAT LESS
SALT !!!

Modifiable risk factors

- There are other mineral elements such as **Potassium** which are determinants of blood pressure.
- Potassium antagonizes the biological effects of sodium and thereby reduces blood pressure.
- Potassium supplements have been found to lower the blood pressure of mild to moderate hypertensives.
- **Calcium and Magnesium** have also been suggested in reducing blood pressure levels.

Modifiable risk factors

C- SATURATED FAT

The evidences suggest that saturated fat raises blood pressure as well as serum cholesterol.

Modifiable risk factors

D- DIETARY FIBRE

Several studies indicate that the risk of CHD and hypertension is inversely related to the consumption of dietary fibre.

Most fibres reduce plasma total and LDL cholesterol.

Modifiable risk factors

E- ALCOHOL

High alcohol intake is associated with an increased risk of high blood pressure.

It appears that alcohol consumption raises systolic blood pressure more than the diastolic.

Findings show that alcohol-induced hypertension returns to normal with abstinence.

Modifiable risk factors

F- ENVIRONMENTAL STRESS

Since stress is nowhere defined, the hypothesis is untestable.

However, it is an accepted fact that psychosocial factors operate through mental processes, consciously or unconsciously, to produce hypertension.

Modifiable risk factors

G- OTHER FACTORS

- The commonest cause of secondary hypertension is **oral contraception**, because of the oestrogen component in combined preparations.
- **Noise**
- **Vibration**
- **Temperature and Humidity** are causes which require further investigation.

PREVENTION OF HYPERTENSION

The W.H.O has recommended the following approaches in the prevention of hypertension:

1. Primary prevention
    a. Population strategy
    b. High-risk strategy

2. Secondary prevention

Primary Prevention

Primary prevention has been defined as “all measures to reduce the incidence of disease in a population by reducing the risk of onset.

The W.H.O. has recommended the following approaches in the prevention of hypertension:

Primary Prevention

A. Population Strategy

The population approach is directed at the whole population.

The approach is based on the fact that a small reduction in the average blood pressure of a population would produce a large reduction in the incidence cardiovascular complications, e.g; stroke and CHD.

Primary Prevention

This is involves a multifactorial non-pharmacotherpeutic interventions:

a. Nutrition: dietary changes at the individual and population levels

b. Weight reduction: promote healthy lifestyles

Primary Prevention

c. Exercise promotion: promote regular physical exercise.

d. Health education: the whole community must be mobilized and made aware of the possibility of primary prevention of hypertension.

Primary Prevention

B. High Risk Strategy

- This approach is appropriate if the risk factors occur with very low prevalence in the community.

- Individuals with family history are tracked to identify individuals at risk.

Secondary Prevention

The goal of secondary prevention is to detect and control high blood pressure in affected individuals by anti-hypertensive drug therapy.

a. **Early Case Detection:** through screening campaigns

b. **Treatment:** in hypertension as diabetes, we cannot treat the cause, but the aim of treatment should be to obtain a blood pressure below 140/90

Secondary Prevention

c. Patient Compliance:

which is defined as: “the extent to which patient behaviour (in terms of taking medicines, following diets, or executing other lifestyle changes) coincides with clinical prescription.

The compliance rates can be improved through education directed to patients, families, and the community.

Obesity

السمنة

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Obesity

Obesity may be defined as an abnormal growth of the adipose tissue due an enlargement of

fat cell size (**hypertrophic obesity**)

or

an increase in **fat cell number** (**hyperplastic obesity**)

or

a combination of both

Prevalence

- Obesity is the most prevalent form of malnutrition.

- As a chronic disease, is prevalent in both developed and developing countries.

- Affecting children as well as adults.

- It is one of the most significant contributors to ill health.

Prevalence

For industrialized countries, it has been suggested that such increase in body weight have been caused **primarily by reduced levels of physical activity rather than changes in food intake**.

It is difficult to compare the prevalence rates in different countries as no exact figures are available and also because the definitions of obesity are not standardized.

Overweight and Obesity are the 5th leading risk of Global Deaths

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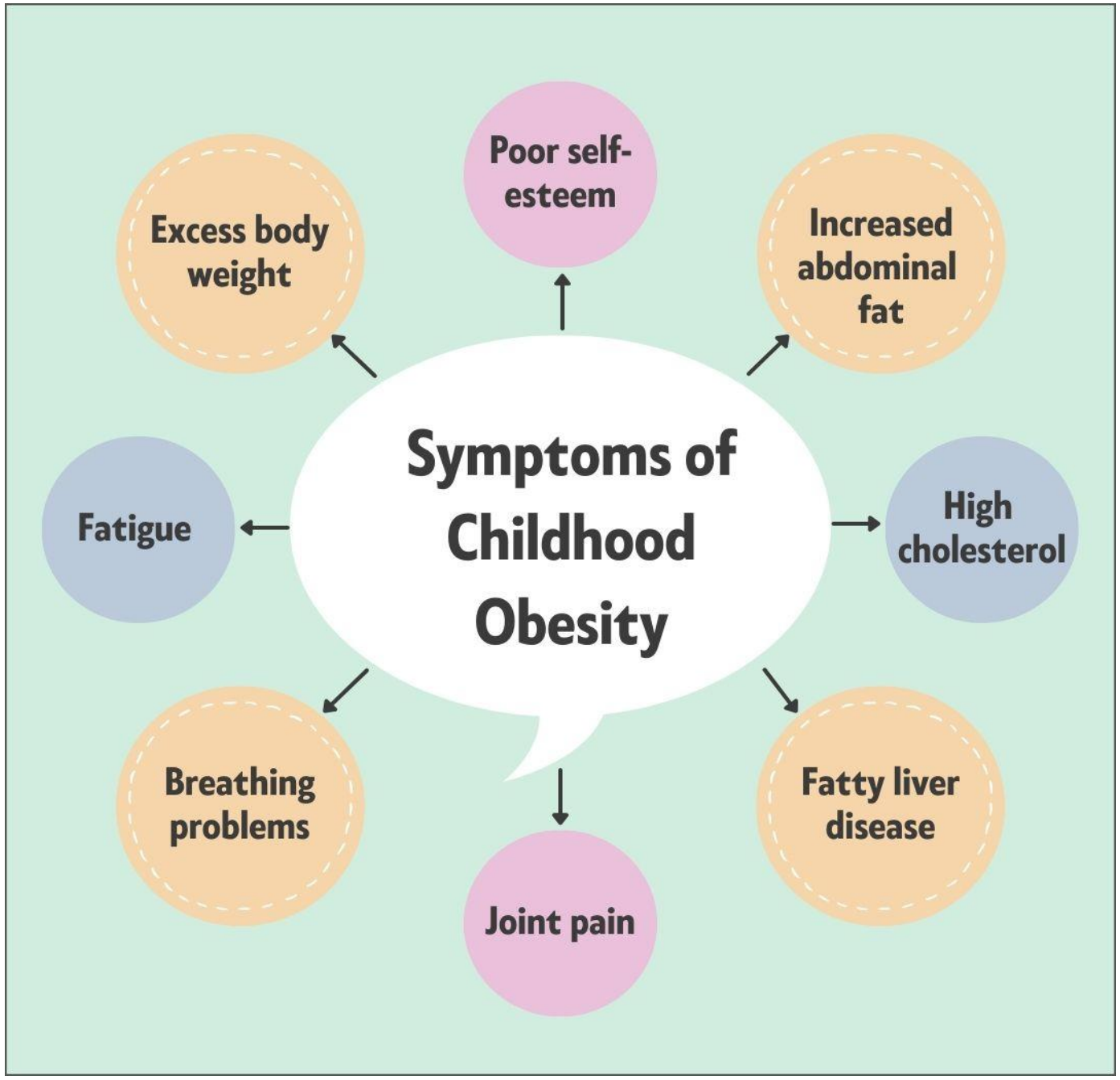
Prevalence

Once considered a high-income country problem, overweight and obesity are now rising in low- and middle-income countries.

Childhood obesity is associated with a higher chance obesity, premature death and disability in adulthood.


Symptoms of Childhood Obesity
Poor self-esteem
Excess body weight
Increased abdominal fat
Fatigue
High cholesterol
Breathing problems
Fatty liver disease
Joint pain

Prevalence

Obesity is associated with increased risk of breathing difficulties, fractures, early markers of cardiovascular disease, insulin resistance, and psychological effects.

At least 3.4 million adults die each year as a result of being overweight or obese.

Epidemiological Determinants

The aetiology of obesity is complex, and is one of multiple causation.

AGE:

Obesity can occur at any age, and generally **increases with age**.

Epidemiological Determinants

SEX:

Women generally have higher rates of overweight.

It was found that

Men gain weight between the ages of **29 and 35 years**.

Women gain weight between **45 and 49 years** of age.

Epidemiological Determinants

GENETIC FACTORS:

There is a genetic component in the aetiology of obesity.

Recent studies have shown that the amount of abdominal fat was influenced by a genetic component.

Epidemiological Determinants

EATING HABITS:

Eating in between meals , preference to sweets, refined foods and fats, the composition of the diet, the periodicity with which it is eaten, and the amount of energy derived from the diet, are all relevant to the aetiology of obesity.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Epidemiological Determinants

Nowadays, **television and printed media** are playing an important role in producing obesity by heavy advertisement of fast food outlets of energy-dense poor food and beverages of multinational corporations, which influence the daily eating habits.

Epidemiological Determinants

PSYCHOSOCIAL FACTORS:

E.g; emotional disturbances are deeply involved in the aetiology of obesity.

Overeating may be a symptom of depression, anxiety, frustration and loneliness.

Excessively obese individuals are usually withdrawn, self-conscious and lonely.

Epidemiological Determinants

ALCOHOL:

Recent studies concluded that the relationship between alcohol consumption and adiposity was generally positive for men and negative for women.

Classification of Obesity

The Body Mass Index (BMI) is a simple index of weight-for-height that is commonly used to classify underweight, overweight, and obesity in adults.

BMI Formula

Body weight in **Kilograms** divided by the **Square** of the height in **Metres**

Classification of Obesity

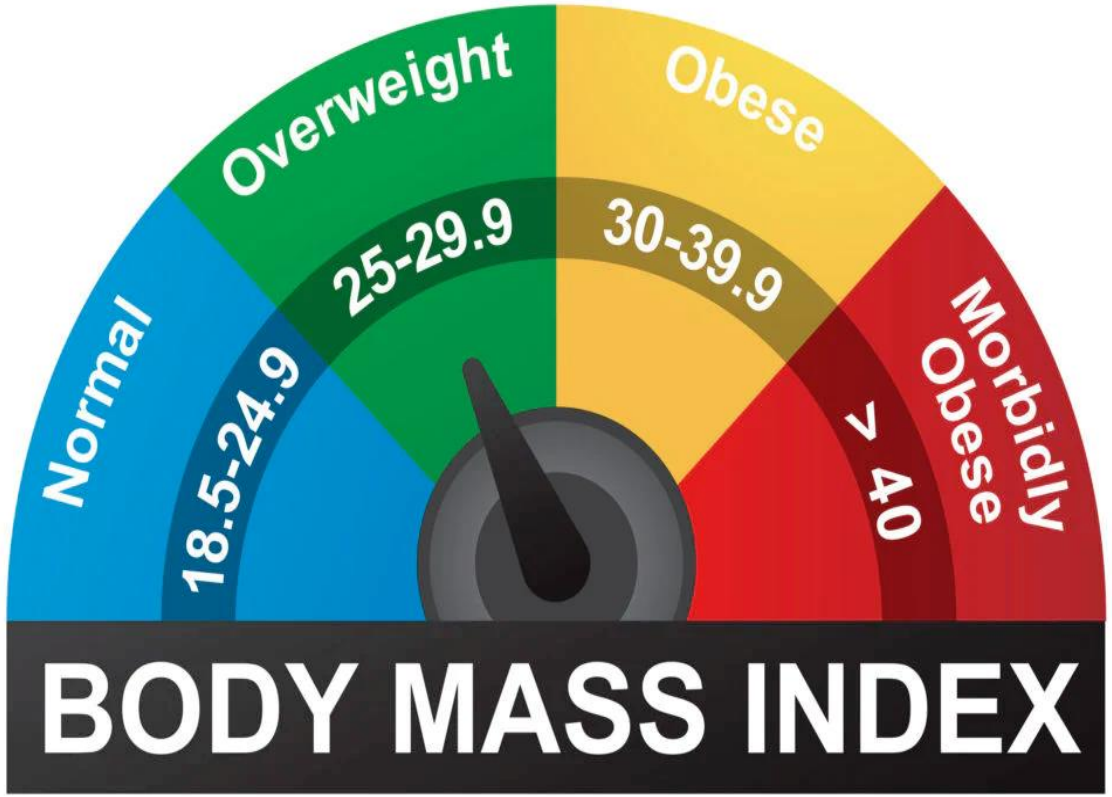
$$\text{BMI} = \frac{\text{Weight in kilogram}}{\left(\text{Height in meter}\right)^2}$$

EXAMPLE:

An adult who weighs 70 kgm and whose height is 1.75 m

BMI = $\dfrac{70}{(1.75)^2} = 22.9$

Obesity is often expressed in terms of body mass index (BMI)



Weight in Pounds

Height in Feet and Inches	120	130	140	150	160	170	180	190	200	210	220	230	240
4'6	29	31	34	36	39	41	43	46	48	51	53	56	58
4'8	27	29	31	34	36	38	40	43	45	47	49	52	54
4'10	25	27	29	31	34	36	38	40	42	44	46	48	50
5'0	23	25	27	29	31	33	35	37	39	41	43	45	47
5'2	22	24	26	27	29	31	33	35	37	38	40	42	44
5'4	21	22	24	26	28	29	31	33	34	36	38	40	41
5'6	19	21	23	24	26	27	29	31	32	34	36	37	39
5'8	18	20	21	23	24	26	27	29	30	32	34	35	37
5'10	17	19	20	22	23	24	26	27	29	30	32	33	35

Classification of Obesity

These BMI values are age-independent and the same for both sexes.

BMI does **NOT** distinguish between weight associated with muscle and weight associated with fat.

As a result, the relationship between BMI and body fat content varies according to body build and proportion.

Assessment of Obesity

1- BODY WEIGHT

Though **not an accurate measure of excess fat**, is a widely used index.

Assessment of Obesity

2- SKINFOLD THICKNESS

A large proportion of total body fat is located under the skin.

Since it is the most accessible, it is the non-invasive method most used for assessing body fat.

Assessment of Obesity

Sites of measurement

1- Mid-triceps

2- Biceps

3- Subscapular

4- Supra-iliac

Skinfold Caliper Harpenden

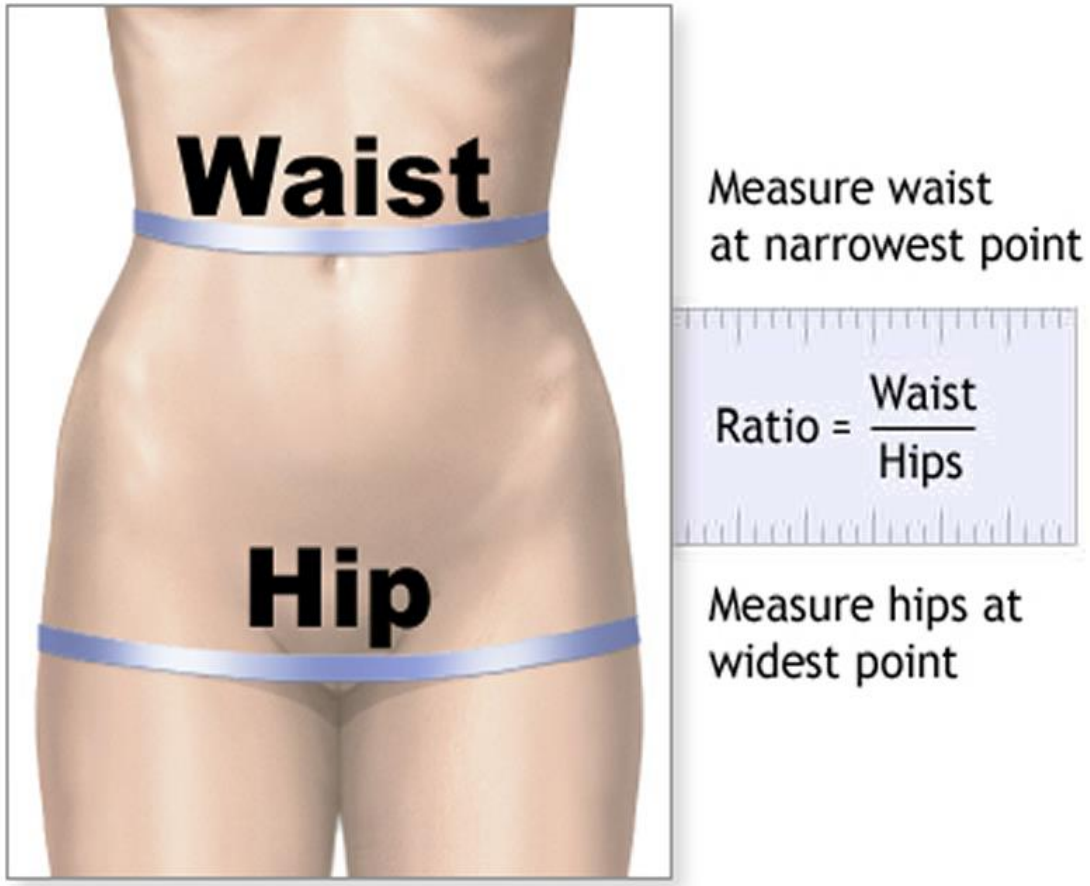
Assessment of Obesity

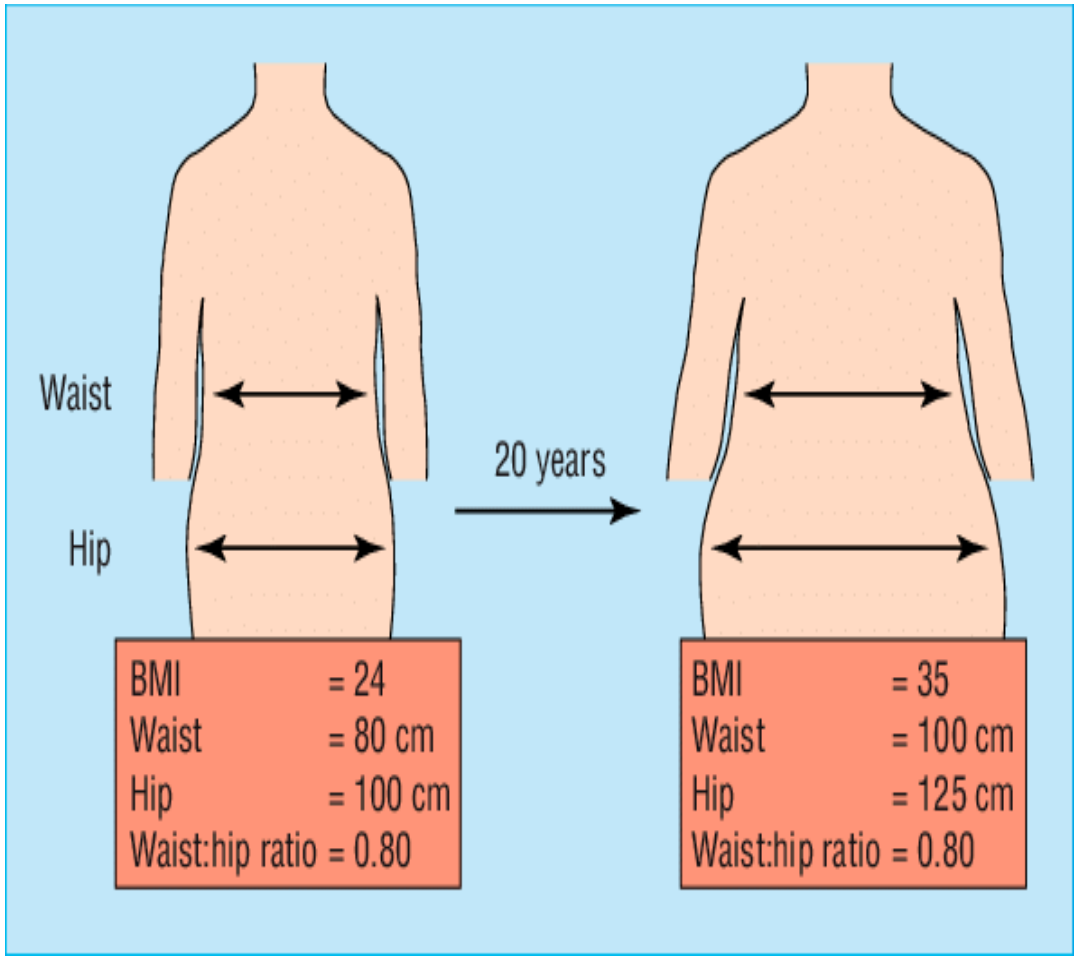
3- WAIST- HIP CIRCUMFERENCE RATIO

Waist circumference is measured at the midpoint between the lower border of the rib cage and the iliac crest.

It is an approximate index of intra-abdominal fat mass and total body fat.

Assessment of Obesity





Assessment of Obesity

It has become accepted the **high**

WHR > 1.0 in **MEN**

And

WHR > 0.85 in **WOMEN**

indicates abdominal fat accumulation.

Prevention and Control

Weight control is widely defined as approaches to maintaining weight within the healthy range of body mass index of 18.5 to 24.9 kgm/m^2 throughout adulthood

Prevention of obesity should begin in early childhood.

Obesity is harder to treat in adults than in children.

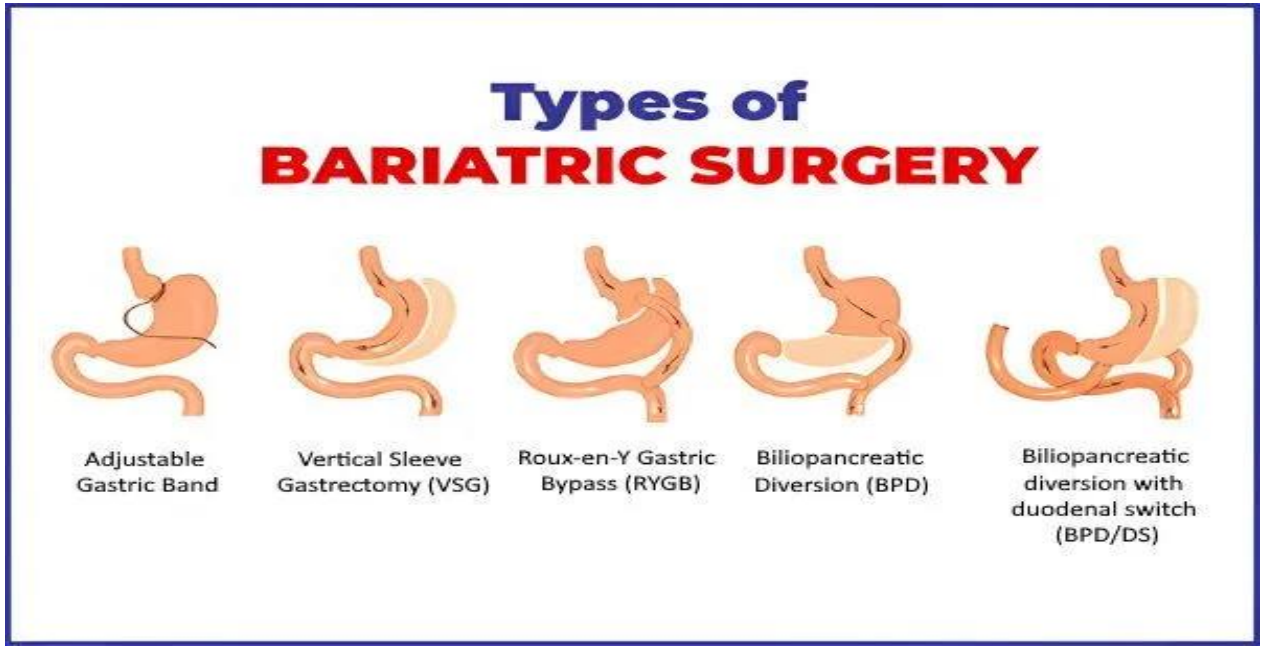
Prevention and Control

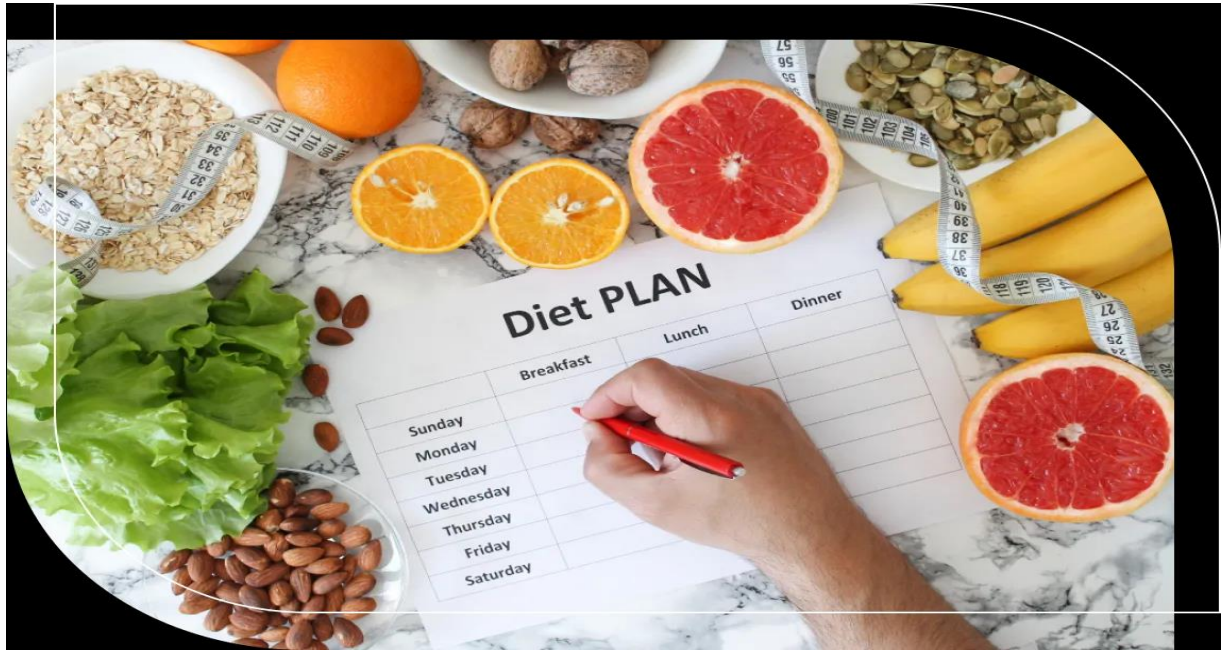
1- DIETARY CHANGES

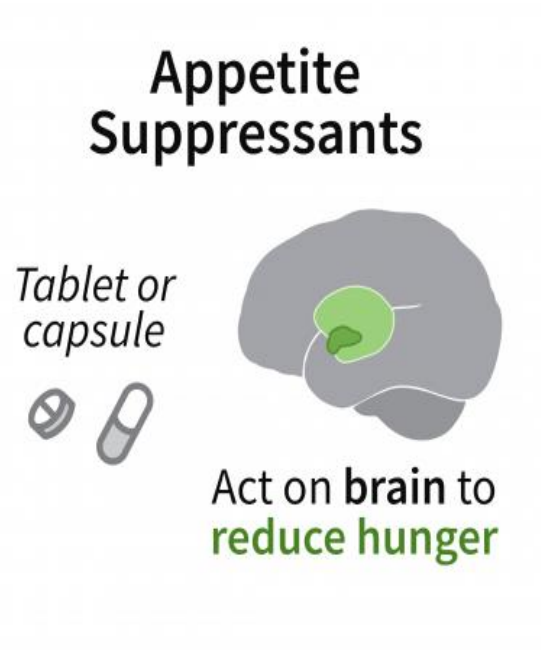
2- INCREASED PHYSICAL ACTIVITY

3- APPETIE SUPPRESSING DRUGS

4- BARIATRIC SUGERY







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W.H.O Global Action Plan for the Prevention and Control of NCDs

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Prevention

The preventive attack on chronic diseases is based on the knowledge that they are multifactorial in causation, so their prevention demands a complex mix of interventions.

Previously only tertiary prevention seemed possible to prevent or delay the development of further disability or occurrence of premature death.

Prevention

But, now, with the identification of risk factors, health promotion activities aimed at primary prevention are being increasingly applied in the control of chronic diseases.

Some of the interventions that should be undertaken immediately to produce accelerated results in terms of lives saved, disease prevented and heavy cost avoided:

Prevention

1- **Protecting people from tobacco smoke** and banning smoking in public places, warning about dangers of tobacco use, enforcing bans on tobacco advertising, promotion, sponsorships and raising taxes on tobacco.

2- **Restricting salt intake** and salt content of food.

Prevention

3- **Restricting access to retailed alcohol**, enforcing bans on alcohol advertising and raising taxes on alcohol.

4- **Replacing trans-fat in food** with polyunsaturated fat.

5- **Promoting public awareness about diet and physical activity**, including mass media.

In addition, there are many other cost-effective and low-cost population wide interventions that can reduce risk factors for NCDs

1- Nicotine dependence treatment

2- Enforcing of drink-driving laws

3- Restrictions on marketing of foods and beverages high in salt, fats, and sugar

4- Food taxes and subsidies to promote healthy diets

In addition, there are many other cost-effective and low-cost population wide interventions that can reduce risk factors for NCDs

5- Health nutrition environments in schools

6- Nutrition information and counselling in health care

7- National physical activity guidelines (school based physical activity programmes for children and workplace programmes for physical activity and healthy diets)

W.H.O Global Action Plan for Prevention and Control of NCDs (2013 – 2020)

The Global Action Plan provides member states with a road map and menu of policy options which when implemented collectively between 2013 and 2020 will contribute to progress on **9** global NCD targets.

W.H.O Global Action Plan for Prevention and Control of NCDs (2013 – 2020)

1- A 25% relative reduction in risk of premature mortality from cardiovascular diseases, cancer, diabetes and chronic respiratory disease.

2- At least 10% relative reduction in the harmful use of alcohol.

W.H.O Global Action Plan for Prevention and Control of NCDs (2013 – 2020)

3- A 10% relative reduction in the prevalence of insufficient physical activity.

4- A 10% relative reduction in mean population intake of salt/ sodium

5- A 10% relative reduction in prevalence of current tobacco use in persons aged 15+ years

W.H.O Global Action Plan for Prevention and Control of NCDs (2013 – 2020)

6- A 25% relative reduction in prevalence of raised blood pressure

7- Halt the rise of diabetes and obesity

8- At least 50% of eligible people receive drug therapy and counselling to prevent heart attacks and strokes

W.H.O Global Action Plan for Prevention and Control of NCDs (2013 – 2020)

9- An 80% availability of the affordable basic technology and essential medicines including generics, required to treat major NCDs in both public and private facilities