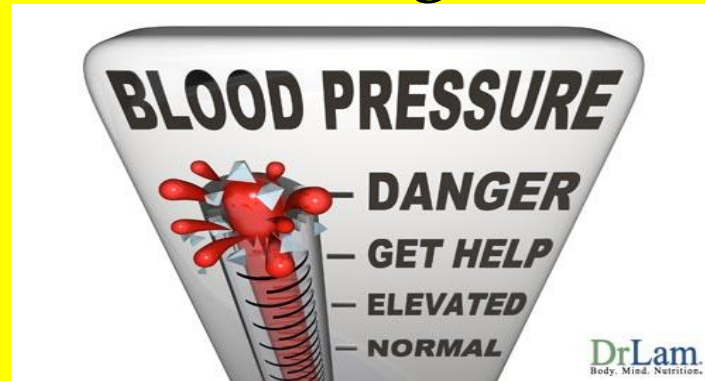


# **Epidemiology of Non-communicable Disease**

**Dr. Nedal**

# HYPERTENSION

- Hypertension is diagnosed if, when it is measured on two different days, the systolic blood pressure readings on both days is  $\geq 140$  mmHg and/or the diastolic blood pressure readings on both days is  $\geq 90$  mmHg



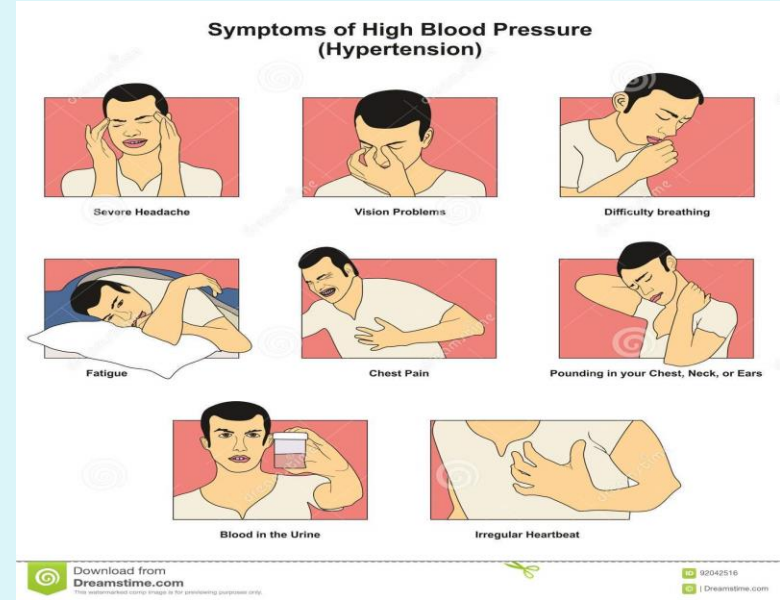
- Causes:
- There are two types of high blood pressure.
- **Primary (essential) hypertension**
- For most adults, there's no identifiable cause of high blood pressure. This type of high blood pressure, called primary (essential) hypertension, tends to develop gradually over many years.

# Secondary hypertension

1. Obstructive sleep apnea
2. Kidney problems
3. Adrenal gland tumors
4. Thyroid problems
5. Certain medications, such as birth control pills, cold remedies, decongestants, over-the-counter pain relievers and some prescription drugs
6. Illegal drugs, such as cocaine and amphetamines
7. Alcohol abuse or chronic alcohol use

# Symptoms and Signs

- Asymptomatic
- Dizziness,
- flushed face
- headache,
- fatigue,
- Epistaxis and nervousness
- severe cardiovascular, neurologic, renal, and retinal symptoms



# Risk factors

High blood pressure has many risk factors, including:

1. **Age.** Above 45 years (men) and 65 years (female)
2. **Race:** common among **blacks**
3. **Family history.**
4. **Too much salt (sodium) in your diet.** Water retention
5. **Too little potassium in your diet.** Potassium helps balance the amount of sodium in your cells.

6. **Being overweight or obese.** High demand of oxygen and nutrition.
7. **Not being physically active.** The higher your heart rate, the harder your heart must work with each contraction and the stronger the force on your arteries.
8. **Using tobacco.** The chemicals in tobacco can damage the lining of your artery walls. This can cause your arteries to narrow, increasing your blood pressure.

9. **Too little vitamin D in your diet.** It's uncertain if having too little vitamin D in your diet can lead to high blood pressure.
10. **Drinking too much alcohol.** Over time, heavy drinking can damage your heart.
11. **Stress.** High levels of stress can lead to a temporary increase in blood pressure.
12. **Certain chronic conditions.** such as kidney disease, diabetes and sleep apnea.



# Diagnosis

- *Multiple measurements of BP to confirm*
- *Urinalysis and urinary albumin:creatinine ratio; if abnormal, consider renal ultrasonography*
- *Blood tests: Fasting lipids, creatinine, potassium*
- *Renal ultrasonography if creatinine increased*
- *Evaluate for aldosteronism if potassium decreased*
- *ECG: If left ventricular hypertrophy, consider echocardiography*
- *Sometimes thyroid-stimulating hormone measurement*
- *Evaluate for pheochromocytoma or a sleep disorder if BP elevation sudden and labile or severe*

# ● Treatment

1. *Weight loss and exercise*
2. *Smoking cessation*
3. *Diet: Increased fruits and vegetables, decreased salt, limited alcohol*
4. *Drugs if BP is initially high (>160/100 mm Hg) or unresponsive to lifestyle modifications*
5. *Lifestyle modifications*

# OBESITY

- It is characterized by the abnormal growth of the adipose tissue, resulting in an increase in the body weight to the extent of 20% or more of standard weight for the person's age , sex and height.



- **Corpulence index:** this is based on only weight of the individual.
- = Actual body weight of the individual
- Expected body weight
- **Expected weight formula:**
- **Broca's** = height in cm - 100

- **Body mass index:** This is based on weight and height of the individual.
- =  $\frac{\text{Weight in Kg}}{(\text{Height in mtr})^2}$
- **Waist circumference:** It is measured at a mid point between the lower border of the rib cage and the iliac crest. Men > 102 cm and women > 88 cm.

# Risk factors

- **Non modifiable risk factors**
- **Age:** Obese children continues to adult life.
- **Sex:** over weight is more among men but obesity among women. It's because of physiological process contribute to an increased storage of fat in female and during pregnancy.
- **Genetic factors:**

# Modifiable risk factors

- **Physical activity:** Regular activity burns Cal
- **Socioeconomic status:** High socioeconomic status correlates positively with obesity in developing countries
- **Literacy level:** less literacy level
- **Body image:** Thin and slim body symbolizes competence, while obesity represents laziness
- **Eating habits:** Overnutrition (95%)



- **Alcoholism:** Every gram = 7 k Cal of energy.
- **Smoking:** Smoking and obesity is inversely related.
- **Psychological factors:** Emotional strains people find satisfaction in eating the food.
- **Drug use:** use of corticosteroids, oral contraceptive pills, insulin, beta adrenergic blockers can promote weight gain.
- **Environmental factors:** Modernization of standard of living.



# Prevention and control

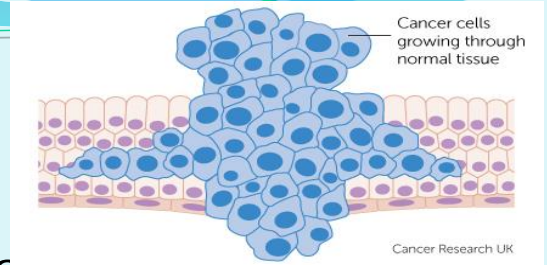
## Aim

- To maintain BMI between 18 to 25 throughout adulthood.
- To prevent the development of over weight
- To prevent the progression of overweight to obesity.
- To prevent regain of weight among those obese patients, who have already lost so weight

# Strategies

- **Dietary changes**
- Refrain from over consumption of fats and carbohydrates
- -cereal, legumes and vegetables, fiber content should be increased.
- **Physical activities:**
- Regular physical activity helps in increasing the energy expenditure.
- **Health education:** on hazards of obesity and it's prevention by healthy diet and lifestyle

# CANCER



Cancer is a most fearful disease.

It is characterized by the following features:

- Abnormal and uncontrolled growth of the cells.
- The presence of aberrations in the nucleus.
- Ability to invade the surrounding tissues and even distant organs later.
- Eventual death of the person, if the tumor has progressed beyond a certain stage at which it can be successfully removed.

# Agent factors

## Types

1. Physical agents: Heat, solar radiation, ionizing radiation
2. Mechanical: Friction
3. Chemical: Aniline, asbestos dye, benzol, nickel, coal tar
4. Biological: hepatitis b virus, cytomegalovirus virus, Epstein-Barr virus, human papilloma virus, human T cell lymphoma virus, aspergillusflavus and herpes virus.
5. Nutritional: smoked fish, beef, high intake of fat, alcohol.
6. Socio-environmental: Tobacco, over use of estrogen drug, sunlight.

# Host factors

1. Age: in developing countries, (young people)
2. Sex: among men than among women.
3. Occupation: in certain types of industries:  
Example: coal tar, soot, pitch, dyes, U-V radiation,
4. Habits: smoking, alcoholism, sun bath, pan, zarda, low fibre diet, excessive sex with multiple partners.
5. Environmental Factors: air pollution and ozone layer depletion.

# Prevention: Health promotion

- A. " Danger signal" of cancer

1. A lump in the breast
2. A non healing ulcer
3. Sudden change in the wart or mole
4. Persistent indigestion or difficulty in swallowing
5. Hoarseness of voice
6. Unusual bleeding from any natural orifice
7. Any change in the usual bowel habit
8. Un explained loss of weight



- **B.** People are also educated to avoid alcohol, smoking, pan,
- **C.** To increase the use of legumes, grains, fruits and vegetables and to avoid coloring agents, fast food etc
- **D.** To maintain high standard of personal hygiene, specially among industrial workers.
- **E.** Women are educated about self examination of the breasts.

- **Control of air pollution:**By dilutions, replacement and legislation from a part of cancer control activities.
- **Oral hygiene:** Maintenance of oral hygiene and correction of non- alignment of teeth resulting in aphthous ulcers, goes a long-way in prevention of oral cancers.
- **Legislation:** To control consumption of alcohol, tobacco and food related carcinogens.
- To control air pollution
- To protect "at- risk" industrial workers.



# Specific protection

- Avoidance of carcinogens
- Immunization against hepatitis B to prevent liver cancer.
- Treatment of pre-cancerous lesions.
- At risk industrial workers should wear protective gadgets.
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# Secondary prevention

1. Early diagnosis and treatment
2. Early diagnosis- is done by history, clinical exam and investigation. Screening of those who comes with warning signals and those at risk.
3. Exfoliative cytology to detect ca cervix
4. X-ray chest and sputum cytology - to detect bronchogenic ca.
5. Mamography- to detect ca breast.
6. Endoscopic examination- to detect ca of stomach, colon and other hallow viscera.

# Treatment

- Surgery
- Chemotherapy
- Radiation therapy
- Immunotherapy

# Tertiary prevention

- Disability limitations
- Rehabilitation
- Rehabilitation with a prosthesis and training, later placed in a suitable job.

# DIABETES MELLITUS

- It is a metabolic syndrome, clinically characterized by polyuria, polyphagia, polydipsia, hyperglycemia and glycosuria due to absolute or relative deficiency of the hormone insulin, that control the metabolism of carbohydrates, protein, fat and electrolytes.



# Classification of diabetes mellitus

## Primary

- Type 1 Insulin dependent diabetes mellitus
- Type 2 Non insulin dependent diabetes mellitus

## Secondary

- Pancreatic pathology
- Excessive production of hormone antagonist to insulin
- Long term use of drugs like corticosteroids, oral contraceptive
- Liver disease
- Genetic syndrome

# Agent factors


- Underlying cause of DM is deficiency of insulin.
- The overall effects of these mechanism is reduced utilization of glucose leading to Hyperglycemia and glycosuria.
- Other causes could be decreased insulin sensitivity and increased insulin resistance or synthesis of abnormal, biologically less active insulin molecule

# Host factors

- Age: Type 1 (younger age ) and Type 2 among middle aged and elderly.
- Sex: Type 1 DM (men) and type 2 (women)
- Genetic factors: Type 2 shows 90% concordance genetic component whereas Type 1 shows only 50%.
- Obesity: obesity increases the insulin resistance and reduces the number of insulin receptors on target cells.



- **Environmental Factors:**
- **Pregnancy:** It places a burden on beta cells of pancreas to secrete more insulin.
- **Viral infection:** rubella virus, mumps, rheovirus
- **Diet:** wheat and cow's milk have diabetogenic factors,  
A high saturated fat intake
- **Malnutrition:** diabetes directly cause by protein deficiency.
- **Alcoholism:** Excessive intake can lead to type 2 DM.

- 
- Lifestyle: lack of exercise is risk factor for DM type 2.
  - Immunological factors: Auto immune disorder can cause diabetes.
  - Stress and strain: pregnancy, surgery, trauma can lead to DM.
  - Socioeconomic class: change in lifestyle.

- **Potential diabetic:** It is a one who has risk of developing DM due to genetic reasons.
- **Latent diabetic:** It is a one who has risk of developing DM due to stressful conditions like pregnancy, surgery, trauma, infection. They may returns to normal if stress is removed.
- **Black zone:** is a state of affairs in a type 2 DM patients, in whom blood glucose levels are high but do not have symptoms, although the process of complications is going on.

# Prevention and care of diabetes

- **Population strategy**
- Improvement in the nutritional habits
- Maintenance of body weight
- Genetic counseling: consanguineous marriage to be discouraged.
- Prospective eugenics تحسين النسل المحتمل : one diabetic should not marry another diabetic
- Retrospective eugenics: if they are already married, they should not have children.

# High-risk strategy

- Correction of obesity
- Avoiding over nutrition and alcohol
- Changing lifestyle
- Regular exercises
- Maintenance of normal body weight
- Avoidance of oral contraceptive and steroids
- Reduction of factors promoting atherosclerosis
- Yoga exercise and meditation to be encouraged

## ● **Secondary prevention**

### ● Aim

● To maintain normal blood glucose level

● To maintain normal body weight

●

### ● **Principle treatment:**

● Diet : Small balanced meals more frequently.

● More of raw vegetables and less cereals

# Self-care in diabetes mellitus

- Personal hygiene: Feet hygiene is important.

Person should:

- Look for changes in color, temperature, swelling crakes and wounds
- Always wear footwear.
- Keep the feet clean, dry and warm



- Change socks daily
- Habits: Should avoid smoking, spirit and steroids.
- Exercise regularly
- Diet:
- Drug: take regularly

## **Tertiary Prevention**

- Disability limitation
- Rehabilitation



# ACCIDENTS



- Accidents is an event, independent of human willpower, caused by a rapidly acting external force, resulting in physical with or without mental damage.
- If death occurs at once or within a week after the accident, it is called fatal accident;
- if death occurs after a week but within a month, it is called death due to accident or killed in accident and
- if death occurs after one year, it is called the sequel of accident.

# Measurements

- **Mortality indicator**
- Proportional mortality rate(% of total deaths)
- Number of deaths per 1000 registered vehicle per year.
- **Morbidity indicator**
- This is measured in term of serious and slight injury assessed by a scale known as Abbreviated injury scale.
- **Disability rate**
- This depends on severity, duration of disability.

# Types of accidents

- **Road traffic accidents:** Deaths due Motor vehicle accident

## Factors

1. Poor maintenance of vehicle
2. Large number of vehicles.
3. Overloading of vehicles
4. Low driving standard
5. Drink and drive

- **Railway accidents** : Deaths due to train accidents
- Factors : Improper maintenance and Terrorism
- **Domestic accidents**: occurring in and around the house. These includes burns, drowning, poisoning
- **Industrial accidents**:
- The workers at risk caused by mechanical equipment, tractors and pesticide.
- **Violence**:
- Due to war, antisocial activities and terrorism.

# Agent factors

1. **Age:** 15- 34 years
2. **Sex:** common among men than women
3. **Medical conditions:** epilepsy, vertigo, refractive errors
4. **Experience and training:** common among untrained and unskilled workers
5. **Habits:** drugs, alcoholism, smoking

# Environmental factors:

- **Relative to road:** defective roads, poor lightening , many curves, slippery roads.
- **Relating to vehicles:** over speed, poorly maintenance, overload and low driving standard.
- **Season:** bad weather in winter and rainy season
- **Legislation:** Ignoring rules, fraud issue of Licence
- **Domestic Environment:** Vegetables and fruit peeling on floor, smoking, electric wires, dark corners.

## Prevention:

- 1. Inter-sectoral coordination
- 2. Reporting of all accidents
- 3. Safety education
- 4. Promotion of safety measures
- 5. Alcohol and other drugs
- 6. Primary care
- 7. Enforcement of laws
- 8. Rehabilitation services
- 9. Accident research( extent, types, environment, human behavior, evaluation of control measures)