

# **HYPERTENSION**

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## DEFINITION

- **Hypertension** (HTN or HT), also known as high blood pressure (HBP), is a long term medical condition in which the blood pressure in the arteries is persistently elevated.
- The SBP will be more than or equal of 140 mmHg and DBP will be more than or equal of 90 mmHg



## TYPES

- **Pre hypertension:** SBP: 120-139 mmHg  
DBP: 80-89 mmHg
  - **Hypertension stage I:** SBP: 140-159 mmHg  
DBP: 90-99 mmHg
  - **Hypertension stage II:** SBP: More or equal to 160 mmHg  
DBP: More or equal to 100 mmHg
  - **Pregnancy induced HTN:** because of increased production of hormones and enzymes during pregnancy.
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## ETIOLOGY

- **Primary HTN:** it is the elevation in BP without an identified cause.
- **Secondary HTN:** it is the elevation in BP with an exact cause. This type is account for 5-10% of total cases.
- The causes of Secondary HTN includes
  - Congenital narrowing of aorta



- Renal disease
- Endocrine disorders like cushing's syndrome
- Neurological disorders like brain tumors and head injury
- Sleep apnea
- Medications like oral contraceptive pills, NSAID, and cocaine
- Cirrhosis of liver



## RISK FACTORS

- Age: chance of CAD after 50 yrs of age
- Alcohol, smoking and DM
- Excessive dietary intake of sodium
- Gender
- Family history
- Obesity
- Sedentary life style
- stress



# PATHOPHYSIOLOGY

- The normal blood pressure is maintained by four mechanisms
  - **Sympathetic nervous system activities**
  - **Activities of vascular endothelium**
  - **Activities of renal system**
  - **Activities of endocrine system**



## **SYMPATHETIC NERVOUS SYSTEM ACTIVITIES**

- When the BP is decreasing the activation of SNS will occur. The increased SNS activity increases the heart rate and cardiac contraction.
- The increased the heart rate and cardiac contraction produce vasoconstriction in the peripheral arterioles and promotes the release of renin from kidney.
- The net effect of SNS activation is to increase the arterial blood pressure by increasing cardiac output and systemic vascular resistance.

$$\mathbf{BP=CO \times SVR}$$



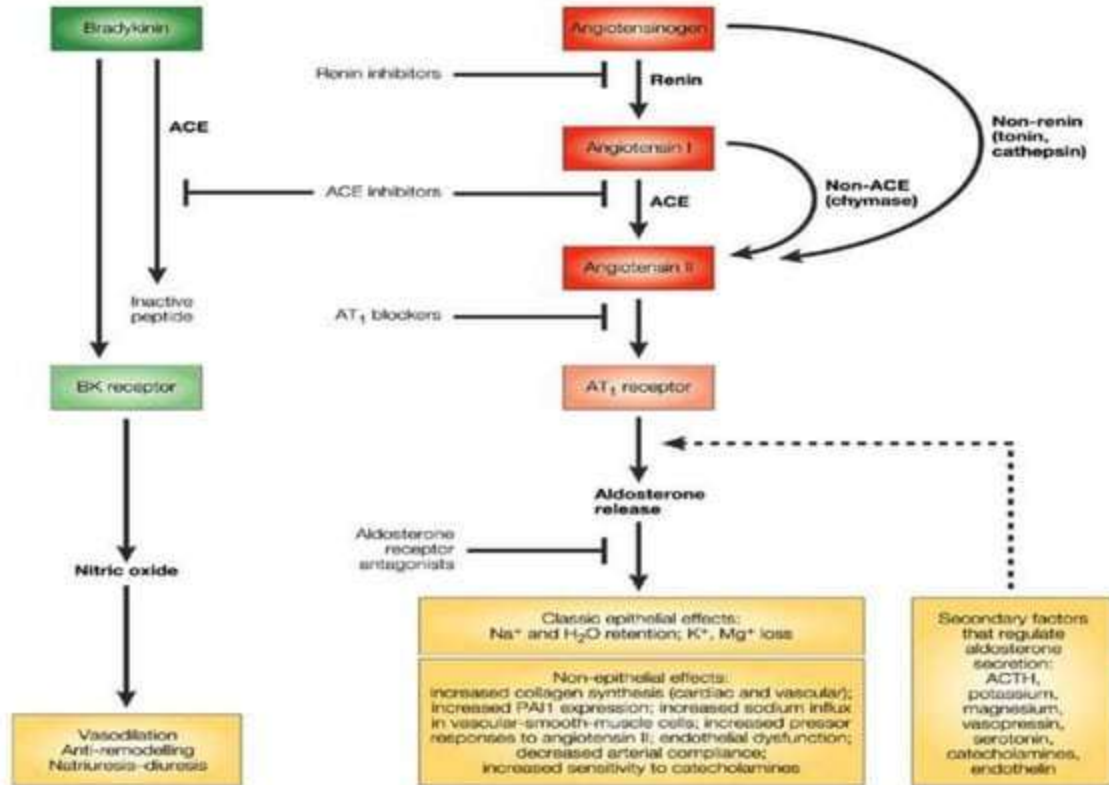


## **ACTIVITIES OF VASCULAR ENDOTHELIUM**

- The vascular endothelium is a single cell layer that lines the blood vessel.
- It will produce vasoactive substances and growth factors like nitric acid, endothelin etc..
- These substances are potent vasoconstrictors and causes increases blood pressure level.



# ACTIVITIES OF RENAL SYSTEM



## ACTIVITIES OF ENDOCRINE SYSTEM

- When the angiotensin-II is stimulated in the adrenal cortex, it will secrete aldosterone.
- The aldosterone will stimulate the kidneys to retain sodium and water. Thus the BP and cardiac output will get increased.



## CLINICAL FEATURES

- Some times the high blood pressure does not causes any symptoms, so that it is known as **silent killer disease**.
- In some patients the symptoms will develop like,



- Severe head ache
- Blurred vision
- Dizziness
- Nausea
- Vomiting
- Fatigue
- Confusion epistaxis
- Chest pain
- Shortness of breath
- Irregular heart beat
- papilledema



## DIAGNOSTIC EVALUATIONS

- History collection and physical examination
- Medical history of diabetes mellitus
- Complete blood count
- Chest x-ray
- ECG



## MANAGEMENT

- Mainly the management of hypertension is possible by two ways, which include
  - **Life style modification**
  - **Pharmacological therapy**



## LIFE STYLE MODIFICATION

The life style modification measures mainly includes,

- Weight reduction
- DASH Diet (Dietary approaches to stop hypertension)
- Dietary sodium reduction
- Reduce alcohol
- Exercise
- Stress management





## PHARMACOLOGICAL THERAPY

Various groups of drugs are used for the treatment of hypertension, collectively these drugs are called as anti-hypertensive drugs, which includes,

- **Diuretics:** it helps the kidneys to inhibit the sodium reabsorption in the distal convoluted tubules, ascending limb and loop of henle.

**Eg: chlorothiazide, furosemide**



- **Beta blockers:** These medications reduces the workload of the heart and blood vessal and causing the heart to beat slowly and with less force.

**Eg: Atenolol, propanolol**

- **Alpha blockers:** These medications causes the peripheral vasodilation of blood vessals.

**Eg: Prazosin**



- **Vasodilators:** These medications acting directly on the muscles in the wall of arteries and preventing the muscles from tightening and arteries from narrowing.

**Eg: Nitroglycerin, Sodium nitro prusside**

- **ACE Inhibitors:** This group of medication will reduce the conversion of A-I to A-II and prevents vasoconstriction.

**Eg: Captopril, Ramipril**



- **Calcium channel blockers:** These medicines will block the movement of extra cellular calcium into the cells and causing vasodilation and decreased heart rate.

**Eg: Amlodipine, Verapamil**



- Alternative therapies which are helpful to regulate blood pressure includes acupuncture, relaxation techniques and diversional therapies.



## NURSING MANAGEMENT

- Proper history collection should be done which includes family history also.
- Dietary habits should be assessed
- Identify the medical history such as diabetes, CAD, renal disease etc...
- Instruct the patient to avoid smoking and alcoholism
- Auscultate heart rate and palpate peripheral pulses.



- Identify the use of medications such as contraceptives, steroids, NSAID etc...
- Monitor vital signs frequently
- Provide diet which is low in sodium and rich with fruits and vegetables.
- Monitor the blood cholesterol level frequently





thank you!