



SNS COLLEGE OF TECHNOLOGY

An Autonomous Institution

**19GET277-BIOLOGY FOR ENGINEERING**

**HYPERTENSION**



# Hypertension:

- High blood pressure is a common condition that affects the body's arteries. It's also called hypertension. If you have high blood pressure, the force of the blood pushing against the artery walls is consistently too high. The heart has to work harder to pump blood.
- **Normal blood pressure.** Blood pressure is 120/80 mm Hg or lower.
- **Elevated blood pressure.** The top number ranges from 120 to 129 mm Hg and the bottom number is below, not above, 80 mm Hg.
- **Stage 1 hypertension.** The top number ranges from 130 to 139 mm Hg or the bottom number is between 80 and 89 mm Hg.
- **Stage 2 hypertension.** The top number is 140 mm Hg or higher or the bottom number is 90 mm Hg or higher.



# Symptoms:

- Most people with high blood pressure have no symptoms, even if blood pressure readings reach dangerously high levels. You can have high blood pressure for years without any symptoms.

A few people with high blood pressure may have:

Headaches

Shortness of breath

Nosebleeds

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# Causes:

- Blood pressure is determined by two things: the amount of blood the heart pumps and how hard it is for the blood to move through the arteries. The more blood the heart pumps and the narrower the arteries, the higher the blood pressure.

There are two main types of high blood pressure.

1. Primary hypertension,
2. Secondary hypertension.

## **Primary hypertension :**

For most adults, there's no identifiable cause of high blood pressure. This type of high blood pressure is called primary hypertension or essential hypertension. It tends to develop gradually over many years.

## **Secondary hypertension :**

- This type of high blood pressure is caused by an underlying condition. It tends to appear suddenly and cause higher blood pressure than does primary hypertension. Conditions and medicines that can lead to secondary hypertension include:
- Adrenal gland tumors
- Blood vessel problems present at birth, also called congenital heart defects
- Cough and cold medicines, some pain relievers, birth control pills, and other prescription drugs



# Risk factors :

High blood pressure has many risk factors, including:

- **Age.** The risk of high blood pressure increases with age. Until about age 64, high blood pressure is more common in men. Women are more likely to develop high blood pressure after age 65.
- **Race.** High blood pressure is particularly common among Black people. It develops at an earlier age in Black people than it does in white people.
- **Family history.** You're more likely to develop high blood pressure if you have a parent or sibling with the condition.
- **Obesity or being overweight.** Excess weight causes changes in the blood vessels, the kidneys and other parts of the body. These changes often increase blood pressure. Being overweight or having obesity also raises the risk of heart disease and its risk factors, such as high cholesterol.
- **Lack of exercise.** Not exercising can cause weight gain. Increased weight raises the risk of high blood pressure. People who are inactive also tend to have higher heart rates.



# Complications :

Uncontrolled high blood pressure can lead to complications including:

- **Heart attack or stroke.** Hardening and thickening of the arteries due to high blood pressure or other factors can lead to a heart attack, stroke or other complications.
- **Aneurysm.** Increased blood pressure can cause a blood vessel to weaken and bulge, forming an aneurysm. If an aneurysm ruptures, it can be life-threatening.
- **Heart failure.** When you have high blood pressure, the heart has to work harder to pump blood. The strain causes the walls of the heart's pumping chamber to thicken. This condition is called left ventricular hypertrophy. Eventually, the heart can't pump enough blood to meet the body's needs, causing heart failure.
- **Kidney problems.** High blood pressure can cause the blood vessels in the kidneys to become narrow or weak. This can lead to kidney damage.
- **Eye problems.** Increased blood pressure can cause thickened, narrowed or torn blood vessels in the eyes. This can result in vision loss.
- **Changes with memory or understanding.** Uncontrolled high blood pressure may affect the ability to think, remember and learn



# Drugs used for treatment of hypertension:

- Diuretics
- Centrally acting agents- methyl dopa, clonidine
- $\beta$ -Adrenoceptor blockers
- $\alpha$ -Adrenoceptor blockers
- Combined  $\alpha$  and  $\beta$  blockers
- ACE inhibitors
- ARBs
- Vasodilators
  - Hydralazine, Minoxidil, Diazoxide, Fenoldopam (arteriolar)
- CCBs)
  - Sodium nitroprusside (arteriolar + venular)



## Drugs to be avoided for treatment of hypertension associated with other diseases:

Pregnancy	ACEI, ARBs, $\beta$ -blockers, diuretics
Diabetes mellitus (IDDM)	Diuretics, $\beta$ -blockers
Angina pectoris	Vasodilators
Bronchial asthma	$\beta$ -blockers
Peripheral vascular disease	$\beta$ -blockers
CHF	CCBs except amlodipine, $\alpha$ and $\beta$ -blockers





Thank you!

