

Hypertension

High blood pressure is a common condition in which the long-term pressure of the blood against the patient's artery walls is high enough that it may eventually cause health problems, such as heart disease.

Blood pressure is determined both by the amount of blood the heart pumps & the amount of resistance to blood flow in the arteries.

Hypertension is largely a condition of older individuals.

Diastolic pressure peaks at age of 50.

Systolic pressure continues to increase with advancing age.

Etiopathogenesis - (How to spread & in which how disease grow).

On the basis of Etiopathogenesis, there are two types of high blood pressure.

- Primary Hypertension - For most adults, there's no identifiable cause of high blood pressure. This type of high blood pressure, called primary hypertension, tends to develop gradually over many years.
- Secondary hypertension → Some people have high blood pressure caused by an underlying condition. This type of blood pressure called secondary hypertension. Various conditions & medication can lead to secondary hypertension, including -
 - Obstructive sleep apnoea. ^{difficulty in breathing} → Thyroid problems.
 - Kidney disease. ^{due to hormone secretion} → certain medication such as birth control pills, cold remedies, over-the-counter pain relievers.
 - Adrenal gland tumours.

Clinical Manifestation -

If your blood pressure is extremely high, there may be certain symptoms to look out for, including Severe headache, Nose bleeding, fatigue or confusion, vision problems, chest pain, Difficulty in breathing, Irregular heartbeat & blood in the urine etc.

People sometimes feel that other symptoms may be related to high blood pressure, but they may not be- Dizziness, Nervousness, sweating, trouble sleeping, facial flushing & blood spot in Eye.

Non- Pharmacological treatment -

Lifestyle modifications for the management of hypertension in patients -

- **Alcohol restriction**- limit Alcohol consumption to two drinks per day for men or one drink per day for women.
- **Diet** → Implement the DASH diet, eat four or five servings of fruit, four or five servings of vegetables & six to eight serving of whole grains each day increase intake of calcium (1,250 mg daily), magnesium (500 mg daily), & potassium (4,700 mg daily), limit intake of cholesterol.
- **Physical activity**- Engage in 30-45 min. of moderate intensity activity most days of the week.
- **Smoking cessation**- Stop smoking to improve overall cardiovascular health.
- **Sodium restriction**- restrict Sodium intake to 2.4 g/day.

→ Weight loss → lose weight, if necessary, to maintain a healthy body weight. (i.e., to

• Pharmacological therapy - relaxes blood vessels as well as a ↓ in Peptides having vasoconstrictor cause ↑ BP blood vol., which lead to lower BP & ↑ oxygen to the heart.

Angiotensin-converting enzyme (ACE) inhibitors -

ACE inhibitors are recommended as first-line antihypertensive agents in patients with diabetes. ACE inhibitors delay progression of diabetic kidney disease & are more effective than other medications in delaying the onset of kidney failure in patients who have hypertension & type 1 diabetes. (captopril, lisinopril), Ramipril.

Help relaxes arteries to lower BP & make it easier for heart to pump blood.

Angiotensin Receptor Blockers (ARBs) - (Azilsartan) Eprosartan

Like ACE inhibitors, ARBs reduce the complications of diabetes & they are preferred agents for managing second hypertension in patients with diabetes. In a randomized controlled trial of patients with type 2 diabetes.

Diuretics -

Thiazide diuretics, either as monotherapy or as part of a combination regimen, are beneficial in the treatment of hypertension in patients with diabetes. (Furosemide, (oxix), Torsemide, spironolactone)

Beta-blockers - (used to manage abnormal heart rhythms & protect heart from second heart attack)

Beta-blockers are a useful treatment when combination therapy is needed to achieve target blood pressure in patients with diabetes. These agents have additional antihypertensive effects when combined with ACE inhibitors in patients with a baseline pulse rate greater than 84 beats per minutes. (atenolol, bisoprolol)

Calcium channel blockers -

Dihydropyridine calcium channel blockers reduce cardiovascular



lar events in patients with diabetes & hypertension, however they may be inferior to other agents in some cardiovascular outcomes.

ex - Amlodipine, nifedipine, verapamil.

Angina or Myocardial Infarction

Ischemia is a condition in which the blood flow is restricted or reduced in a part of the body. Cardiac ischemia is the name for decreased blood flow & oxygen to the heart muscle.

Ischemic heart disease (IHD) is defined as lack of oxygen due to decreased or no blood flow to the myocardium (muscles of heart) due to narrowing or obstruction of coronary artery. It is also called coronary artery disease (CAD).

We can say IHD is the imbalance b/w myocardial oxygen supply & demand includes.

- 1. Angina - Stable & unstable
- 2. Myocardial infarction
- 3. Heart failure.

Angina - Angina is a type of chest pain caused by reduced blood flow to the heart. Angina is a symptom of coronary artery disease. Angina is also called angina pectoris.

Myocardial infarction → Myocardial infarction is a deadly medical emergency where your heart muscle begins to die because it is not getting enough blood flow. A blockage in the arteries that supply blood to your heart usually causes this.

Etiopathogenesis

- Atherosclerosis (tightening of muscle in the wall of artery that send blood to heart)
- Coronary artery spasm
- Use of cocaine
- Blockage of coronary artery by blood clot.
- Inflammation or infection of coronary artery.
- Injury to coronary artery.
- Poor functioning of tiny blood vessels.

Atherosclerosis Arterial spasm + Plaque split + Thrombus

↓
obstruction of sudden reversible obstruction

↓ Occlusion

↓
Ischemia

↓
Hypoxia (oxygen reaching the tissue)
↓ blood flow

Reduced oxygen demand → Angina

↓
Thrombolysis → Unstable angina.

Clinical Manifestation

Anginal pain is (brief) not too bad.

Nondrugological Management

Key interventions include lifestyle changes (eg. Smoking, cessation, dietary modification & increased physical exercise), management of hypertension, diabetes & obesity. For severe nervousness (which can stress the patient), mild anxiety blocking may be prescribed. To deal with mild depression & denial of illness, which are common after acute

coronary syndromes, people are encouraged to talk about their feelings with doctors, nurses, social workers & their family members & friends. Some people require an antidepressant.

Pharmacological management - (Treatment)

① Blood thinners (Aspirin) →

These break the blood clots in the arteries to resume normal blood flow.

② Thrombolytics - These dissolve the blood clots. e.g. Urokinase streptokinase

③ Anti-platelet drug - These prevent the formation of new clots & growth of existing clots. clopidogrel ticlopidine

④ ACE Inhibitors - These lower the BP & reduce stress on heart. Captopril, lisinopril, Ramipril.

5. Pain relievers etc.

Hyperlipidaemia

Definition - Hyperlipidaemia is a condition in which the levels of fats (lipids) in blood, including cholesterol & triglycerides, increases abnormally. Hyperlipidaemia also known as high cholesterol, means you have too many lipids in your blood. Too much cholesterol is not healthy because it can create roadblocks in your artery when blood travels around to your body. This damages the organs. Bad cholesterol (LDL) is the most dangerous type because it causes hardened cholesterol.

deposits to collect inside of your blood vessels. This makes it harder for your blood to get through, which puts you at risk for a stroke or heart attack.

Types of cholesterol-

Total cholesterol

Best no. to have

Less than 200 mg/dl

Bad cholesterol (LDL)

" 100 mg/dl

Good " (HDL)

At least 60 mg/dl

Triglycerides

Less than 150 mg/dl

Clinical Manifestation - Most people don't have symptoms when their cholesterol is high. People have a genetic problem with cholesterol clearance that causes very high cholesterol level may get xanthomas (waxy, fatty plaques on the skin) or corneal arcus (cholesterol rings around the iris of the eye).

Etiopathogenesis - Various hyperlipidaemia causes

include -

- Smoking
- Drinking a lot of alcohol.
- Eating foods that have a lot of saturated fat or trans fats.
- Sitting too much instead of being active
- Being stressed.
- Being overweight.

Non-Pharmacological Treatment

changing their lifestyles may be all some people need to do to improve their cholesterol numbers.

Things you can do include -

- Exercising.
- Quitting smoking.



- Sleeping at least seven hours each night.
- Keeping your stress levels under control.
- Eating healthier foods, not too many fats.
- Losing weight for healthy.

Congestive Heart Failure

Heart failure - Sometimes known as congestive heart failure occurs when the heart muscle doesn't pump blood as well as it should. When this happens, blood often backs up & fluid can build up in the lungs, causing shortness of breath. Certain heart condition, such as narrowed arteries in the heart & high BP, gradually leave the heart too weak or stiff to fill & pump blood properly.

Clinical Manifestation-

Heart failure can be ongoing (chronic) or it may start suddenly (acute). Heart failure signs & symptoms may include -

- Shortness of breath

Pathological Treatment - Heart failure is a chronic disease that needs lifelong management. However, with treatment, signs & symptoms of heart failure can improve, & the heart sometimes becomes stronger.

Medication - Doctors usually treat heart failure with a combination of medications. Depending on your symptoms, you might take one or more medications, including -

- ACE Inhibitors - These drugs relax blood vessels to lower BP, improve blood flow & ↓ the strain on

the heart. Eg → Enalapril, lisinopril & captopril.

- Beta blockers → These drugs slow your heart rate & reduce BP. Beta blockers may reduce signs & symptoms of heart failure, improve heart function & help you live longer. Ex → Metoprolol & Bisoprolol.
- Diuretics → Often called water pills, diuretics make you urinate more frequently & keep fluid from collecting in your body. Eg → Furosemide.
- Digoxin → This drug, also called digitalis, ↑ the strength of your heart muscle contractions. Eg → Lanoxin.
- Other medication → Your doctor may prescribe other medications to treat specific symptoms. For example, some people may receive nitrates for chest pain, statins to lower cholesterol or blood-thinning medication to help prevent blood clots.

Respiratory system →

Asthma -

Asthma also called bronchial asthma, is a disease that affects your lungs. It's a chronic condition, meaning it does not go away & needs ongoing medical management. Asthma can be life-threatening if you don't get treatment.

Asthma attack →

When you breathe normally, muscles around your airways are relaxed, letting air easily

& quietly. During an asthma attack, three things can happen.

- Bronchospasm → The muscles around the airways constrict. When they tighten, it makes your airways narrow. Air can not flow freely through constricted airways.
- Inflammations. The lining of your airways become swollen. Swollen airways do not let as much air in or out of your lungs.
- Mucus Production → During the attack, your body creates more mucus. This thick mucus clogs airways.

Types of asthma - Asthma is divided into following types based on the cause & severity of symptoms.

Intermittent - This type of asthma comes & goes so you can feel normal in b/w asthma flares.

Persistent - Persistent asthma means you have symptoms much of the time. Symptoms can be mild, moderate or severe.

Etiopathogenesis - Asthma has multiple causes-

→ Allergic - Some people's allergies can cause an asthma attack. Allergens include things like- mould, pollen & pet dander.

→ Non-allergic - outside factors like- Exercise, stress, illness & weather may cause a flare.

→ Environmental factors - People can develop asthma after exposure to things that irritate the airways. These substances include allergens, toxins, fumes, perfumes.

→ Genetics - If your family has a history of asthma or allergic disease, you have a higher risk of developing the disease.

- Respiratory Infection → Certain respiratory infection such as Respiratory syncytial virus (RSV), can damage young children's developing lungs.
- Clinical manifestations
People with asthma usually have obvious symptoms. These signs & symptoms resemble many respiratory infections -
 - Chest tightness, pain or pressure.
 - Coughing (especially at night)
 - Shortness of breath.
 - Wheezing (whistling sound)
 - Hypoxia
- Diagnosis & tests-
The healthcare provider will review the medical history, including information about the parents & siblings. The provider will also ask you about your need to know any history of allergies, eczema (a bumpy rash) & other lung disease. Your healthcare provider may order a chest x-ray, blood test or skin test.
- Non-pharmacological treatment →
 - Patient & family education to understand the disease & to develop self confidence & fitness
 - Avoid smoking
 - Avoid identified & causes where possible.
 - Control of extrinsic factors which cause allergy.

Pharmacological treatment →

Bronchodilators → These medicines relax the muscle around your airways. These medicines relieve your symptoms when they happen & are used for intermittent & chronic asthma. Ex- salbutamol, ephedrin.



- Anti-inflammatory medicines → These medicines reduce swelling & mucus production in your airways. Your healthcare provider may prescribe them to take every day to control or prevent your symptoms of chronic asthma. E.g. Metaproterenol, Albuterol.
- Biological therapies for asthma → These are used for severe asthma when symptoms persist despite proper inhaler therapy.
- COPD (Chronic obstructive pulmonary disease) → Chronic obstructive pulmonary disease commonly referred as COPD, is a group of progressive lung diseases. The most common of these disease are Emphysema & chronic bronchitis. Many people with COPD have both of these conditions. Emphysema slowly destroys air sacs in your lungs. Bronchitis causes inflammation & narrowing of the bronchial tubes, which allows mucus to build up. It is estimated that about 30 million people in the United States have COPD. COPD can lead to a faster progression of disease, heart problems & worsening respiratory infections.

Clinical Manifestation →

Early symptoms →

At first, symptoms of COPD can be quite mild. You might mistake them for a cold.

Symptoms include:

- Occasional shortness of breath especially after exercise
- Mild but recurrent cough.



worsening symptoms

Symptoms can get progressively worse & harder to ignore. As the lungs become more damaged, you may experience-

- Shortness of breath
- Wheezing
- Chest tightness.
- Chronic cough with or without mucus.
- Lack of energy.
- Frequent colds, flu or other respiratory infections.
- Fatigue.
- Swelling of the feet, ankles or legs.
- Weight loss.

Etiopathogenesis - Most people with COPD are at least 40 years old & have at least some histories of smoking. The longer & more tobacco products you smoke, the greater your risk of COPD. In addition to cigarette smoke, cigar smoke can cause COPD. Your risk of COPD is even greater if you have asthma & smoke. COPD also caused by fumes.

- Diagnosis of COPD → There's no single test for COPD. Diagnosis is based on symptoms, a physical exam & diagnostic test result.
When you visit the doctor, be sure to mention all of your symptoms. Tell your doctor if -
- You are a smoker & have smoked in the past.
- You are exposed to lung irritant on the job.
- You are exposed to a lot of second hand smoke.
- You have a family history of COPD.



- You have asthma or other respiratory conditions
- You take over-the-counter or prescription medication.

- **Non-Pharmacological Treatment →**

certain lifestyle changes may also help alleviate your symptoms or provide relief.

- If you smoke, quit. Your doctor can recommend appropriate products or support services.
- Whenever possible, avoid second-hand smoke & chemical fumes.
- Get the nutrition your body needs.
- Talk to your doctor about how much exercise is safe for you.

- **Pharmacological Treatment →**

Oxygen therapy → If your blood oxygen level is too low, you can receive supplemental oxygen through a mask or nasal cannula to help you breathe better.

Surgery → Surgery is reserved for severe COPD when other treatments have failed, which is more likely when you have a form of severe emphysema.

- One type of surgery is called bullectomy. During this procedure, surgeons remove large, abnormal air spaces from the lungs.
- Another is lung vol. reduction surgery, which removes damaged upper lung tissue.
- Lung transplantation is an option in some cases.



Inhaled bronchodilators → Medication called bronchodilators those help loosen tight muscles in your airways. They are typically taken through an inhaler or nebulizer.

Short-acting bronchodilators last from 4-6 hours. You only use them when you need them. For ongoing symptoms, there are long-acting versions you can use every day. They last about 12 hours.

Eg → ~~Asthma~~ Aclidinium, Theophylline, Albuterol.

Corticosteroids → Long-acting bronchodilators are commonly combined with inhaled glucocorticosteroids. A glucocorticoid can reduce inflammation in the airways muscles Eg → Beclomethasone, Budesonide

Antibiotics & antivirals → Antibiotics & antivirals may be prescribed when you develop certain respiratory infections. Eg → Ribavirin, Zanamivir.

Vaccines → To lower risk of other respiratory infections, ask your doctor if you should get a yearly flu shot, pneumococcal vaccine, & a tetanus booster that includes protection from ^{short cause} whooping cough.

Endocrine System

Date / /

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Diabetes mellitus

Diabetes mellitus commonly known as diabetes, is a metabolic disease that cause high blood sugar. The hormone insulin moves sugar from the blood into your cells to be stored or used for energy. With diabetes, your body either does not make enough insulin or can not effectively use the insulin it does make.

Untreated high blood sugar from diabetes can damage your nerves, eyes, kidney & other organ. There are a few different types of diabetes -

Type 1 diabetes → It is a autoimmune disease. The immune system attacks & destroys cell in the pancreas, where insulin is made.

Type 2 diabetes → It is occur when your body become resistant to insulin & sugar builds up in your blood.

Prediabetes → It occurs when your blood sugar is higher than normal, but it is not high enough for a diagnosis of type 2 diabetes.

Gestational diabetes → It is high blood sugar during pregnancy.

Clinical manifestations

Increased hunger

, thirst,

wt. loss

frequent urination

blurry vision.

fatigue

Sores that do not heal.

Dry & itchy skin,
UTI

Etiopathogenesis -

Different causes are associated with each type of diabetes.

Type-1 diabetes → Sometimes doctors ~~st~~ could not know exactly what causes type 1 diabetes. For some reason, the immune system mistakenly attack & destroy insulin-producing beta cells in the pancreas.

Type-2 diabetes → It is stems from a combination of genetics & lifestyle factors. Being overweight or obese increases your risk too. Carrying extra wt. especially in your belly.

Gestational diabetes → Gestational diabetes is the result of hormonal changes during pregnancy.

Non-Pharmacological Treatment →

Healthy eating is a central part of managing diabetes. In some cases, changing your diet may be enough to control the disease.



Hypothyroidism

It is a condition in which the thyroid glands is underactive & does not produce enough thyroid hormone.

Etiopathogenesis -

Condition that can cause hypothyroidism include -

- **Thyroiditis** → This condition is an inflammation of the thyroid gland.
- **Hashimoto's thyroiditis** → A painless disease, Hashimoto thyroiditis is an autoimmune condition where the body cells attack & damage the thyroid. This is a genetic condition.
- **Postpartum thyroiditis** → This condition occurs in 5% to 9% of women after childbirth. It is usually a temporary condition.
- **Iodine deficiency** → Iodine is used by the thyroid to produce hormones. An iodine deficiency is an issue that affects several million people around the world.
- **A non-functioning thyroid gland** → Sometimes, the thyroid gland does not work correctly from birth. This affects about 1 in 4000 newborns. If left untreated, the child could have both physical & mental issues in the future.

Clinical Manifestations

Symptoms of an underactive thyroid can include -

- Feeling tired.
- Gaining weight
- Experiencing forgetfulness.
- Having frequent & heavy menstrual periods.

- Having dry & coarse hair.
- Having a hoarse voice.
- Experiencing an intolerance to cold temperature.

Hyperthyroidism - It is a condition in which the body makes too much thyroid hormones, you can develop this condition is called Hyperthyroidism.

Etiopathogenesis → Conditions that can cause hyperthyroidism include -

- **Graves' disease** → In this condition the entire thyroid gland might be overactive & produce too much hormone. This problem is also called diffuse toxic goiter (enlarged thyroid gland).
- **Nodules** → Hyperthyroidism can be caused by nodules that are overactive within the thyroid. A single nodule is called toxic autonomously functioning thyroid nodule, while a gland with several nodules is called a toxic multinodular goiter.
- **Thyroiditis** → This disorder can be either painful or not felt at all. In thyroiditis, the thyroid release hormone that were stored there. This can last for a few weeks or months.
- **Excessive iodine** → When you have too much iodine in your body, the thyroid makes more thyroid hormones than it needs. Excessive iodine can be found in some medication amiodarone, heart medication) & cough syrups.

Clinical manifestations →

Symptoms of an overactive thyroid can include -

- Experiencing anxiety, irritability & nervousness.
- Having trouble sleeping.
- Losing wt.

- Having an enlarged thyroid gland or a goiter.
- Having muscle weakness.
- Feeling sensitive to heat.
- Having vision problems or eye irritation.

Diagnosis & tests -

Sometimes, thyroid disease can be difficult to diagnose because the symptoms are easily confused with those of other conditions. There are tests that can help determine if your symptoms are being caused by a thyroid disease.

These tests include -

- Blood tests
- Imaging tests
- Physical exams.

Management & treatment -

Non-Pharmacological treatment → The standard treatment for hypothyroidism is taking daily thyroid hormone replacement medication. Of course, medications often come with side effects & forgetting to take pill might lead to more symptoms. In some cases, natural remedies may cause fewer side effects & fit into your overall lifestyle better.

- Natural remedies - The goal of natural remedies or alternative medicine is to fix the root cause of the thyroid problem. Thyroid problem sometimes starts as the result of -
Poor diet
stress & missing nutrients in your body

→ **Selenium** → Selenium is a trace element that plays a part in thyroid hormone metabolism. Supplementing this trace element has shown to help balance thyroxin level in some people.

→ **Sugar-free diets** Sugar & processed foods can lead to increased inflammation in the body. Inflammation can slow down the conversion of thyroid hormone. This can make your symptoms & thyroid disease worsen.

Vit. B → low thyroid hormones can affect your body vitamin B-12 levels. Taking a vit. B-12 supplement may help you repair some of the damage hypothyroidism caused.

Pharmacological treatments

→ **Beta blockers** → These medications do not change the amount of hormones in your body, but they help control your symptoms.

→ **Surgery** → A more permanent form of treatment, your healthcare provider may surgically remove your thyroid (thyroidectomy). This will stop it from creating hormones. However, you will need to take thyroid replacement hormones for the rest of your life.

→ **Thyroid Replacement medications** → This drug is a synthetic way to add thyroid hormones back into your body. One drug that's commonly used is called levothyroxine.