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**Review Article**

# Cardiovascular Diseases: A Review

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## ABSTRACT

Your heart is one of your body's most important organs. Essentially a pump, the heart is a muscle made up of four chambers separated by valves and divided into two halves. Each half contains one chamber called an atrium and one called a ventricle. The atria (plural for atrium) collect blood, and the ventricles contract to push blood out of the heart. The right half of the heart pumps oxygen-poor blood (blood that has a low amount of oxygen) to the lungs where blood cells can obtain more oxygen. Then, the newly oxygenated blood travels from the lungs into the left atrium and the left ventricle. The left ventricle pumps the newly oxygen-rich blood to the organs and tissues of the body. This oxygen provides your body with energy and is essential to keep your body healthy.

## INTRODUCTION

The general term used to cover malfunctions of the heart is heart disease, or sometimes Cardiac Disease ("Cardiac" is a Latin term for the heart). Though there are multiple forms of heart disease, our discussion focuses on the two most common: Heart Attack and Heart Failure. This document is designed to teach you about heart attacks and heart failure: what causes these diseases, what forms these diseases take, and what can be done to treat these diseases when they occur. As both of these diseases are to some extent avoidable, we have also provided a discussion of preventative steps you can take to decrease your chances of having to deal with heart disease, or to minimize the negative effects of existing heart disease. Please note that though this information is as accurate as possible, it is no substitute for a qualified physician's advice. Consult with your doctor before making changes to any treatment regimen you may be prescribed, and before beginning any program of exercise or other significant lifestyle change, especially if you have a known heart problem or are a middle-aged or older adult. There is no substitute for your doctor's advice. Although heart disease can occur in different forms, there is a common set of core risk factors that influence whether someone will ultimately be at risk for

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heart disease or not. We start our discussion of heart disease by describing these common risk factors, and then move on to cover specific.[1]

**Congenital Heart Diseases**

Congenital heart disease, or a congenital heart defect, is a heart abnormality present at birth. Which can affects the heart valves and the blood vessels. There are numerous types of congenital heart defects. They can range from simple conditions that don't cause symptoms to complex problems that cause severe, life-threatening symptoms

**Types of Congenital Heart Disease**

Though there are many different types of congenital heart defects, they can be divided into three main categories:

- In heart valve defects, the valves inside the heart that direct blood flow may close up or leak. This interferes with the heart's ability to pump blood correctly.
- In heart wall defects, the natural walls that exist between the left and right sides and the upper and lower chambers of the heart may not develop correctly, causing blood to back up into the heart or to build up in places where it doesn't belong. The defect puts pressure on the heart to work harder, which may result in high blood pressure.
- In blood vessel defects, the arteries and veins that carry blood to the heart and back out to the body may not function correctly. This can reduce or block blood flow, leading to various health complications.

**Symptoms of Congenital Heart Disease**

A congenital heart defect is often detected during a pregnancy ultrasound. If your doctor hears an abnormal heartbeat, for instance, they may further investigate the issue by performing certain tests. In some cases, the symptoms of a congenital heart defect may not appear until shortly after birth. Newborns with heart defects may experience:

- ✓ bluish lips, skin, fingers, and toes
- ✓ breathlessness or trouble breathing
- ✓ feeding difficulties
- ✓ low birth weight
- ✓ chest pain
- ✓ delayed growth

In other cases, the symptoms of a congenital heart defect may not appear until many years after birth. Once symptoms do develop, they may include:

- ✓ abnormal heart rhythms
- ✓ dizziness
- ✓ trouble breathing
- ✓ fainting
- ✓ swelling

**Causes Congenital Heart Disease**

Congenital heart disease occurs as a result of an early developmental problem in the heart's structure. The defect typically interferes with the normal flow of blood through the heart, which may affect breathing. Although researchers aren't exactly sure why the heart fails to develop correctly, suspected causes include the following:

- The heart defect may run in families.
- Taking certain prescription drugs during pregnancy puts a child at a higher risk for a heart defect.
- Using alcohol or illegal drugs during pregnancy can increase a child's risk of having a heart defect.
- Mothers who had a viral infection during the first trimester of pregnancy are more likely to give birth to a child with a heart defect.
- Increased blood sugar levels, such as occurs with diabetes, may affect childhood development. .[2]

**Treatment of Congenital Heart Disease**

The treatment for a congenital heart defect depends on the type and severity of the defect. Some babies have mild heart defects that heal on their own with time. Others may have severe defects that require extensive treatment. In these cases, treatment may include the following:

**Medications**

There are various medications that can help the heart work more efficiently. Some can also be used to prevent blood clots from forming or to control an irregular heartbeat.

**Implantable Heart Devices**

Some of the complications associated with congenital heart defects can be prevented with the use of certain devices, including pacemakers and implantable cardioverter defibrillators (ICDs). A pacemaker can help regulate an abnormal heart rate, and an ICD may correct life-threatening irregular heartbeats.

**Catheter Procedures**

Catheterization techniques allow doctors to repair certain congenital heart defects without surgically opening the chest and heart. During these procedures, the doctor will insert a thin tube into a vein in the leg and guide it up to the heart. Once the catheter is in the correct position, the doctor will use small tools threaded through the catheter to correct the defect.[3]

**Open-Heart Surgery**

This type of surgery may be needed if catheter procedures aren't enough to repair a congenital heart defect. A surgeon may perform open-heart surgery to close holes in the heart, repair heart valves, or widen blood vessels.

**Prevention of Congenital Heart Disease**

- If you're planning on becoming pregnant, talk to your doctor about any prescription or over-the-counter medications you're taking.
- If you have diabetes, make sure your blood sugar levels are under control before becoming pregnant. It's also important to work with your doctor to manage the disease while pregnant.
- If you weren't vaccinated against rubella, or German measles, avoid exposure to the disease and speak with your doctor about prevention options.

**Heart Failure**

Heart failure, sometimes known as congestive heart failure, occurs when your heart muscle doesn't pump blood as well as it should. Certain conditions, such as narrowed arteries in your heart (coronary artery disease) or high blood pressure, gradually leave your heart too weak or stiff to fill and pump efficiently.

Not all conditions that lead to heart failure can be reversed, but treatments can improve the signs and symptoms of heart failure and help you live longer. Lifestyle changes — such as exercising, reducing sodium in your diet, managing stress and losing weight — can improve your quality of life.

One way to prevent heart failure is to prevent and control conditions that cause heart failure, such as coronary artery disease, high blood pressure, diabetes or obesity.

**Symptoms**

Heart failure can be ongoing (chronic), or your condition may start suddenly (acute) heart failure signs and symptoms may include:

- Shortness of breath (dyspnea) when you exert yourself or when you lie down
- Fatigue and weakness
- Swelling (edema) in your legs, ankles and feet
- Rapid or irregular heartbeat
- Reduced ability to exercise
- Persistent cough or wheezing with white or pink blood-tinged phlegm
- Increased need to urinate at night
- Swelling of your abdomen (ascites)
- Very rapid weight gain from fluid retention
- Lack of appetite and nausea
- Difficulty concentrating or decreased alertness

**Causes**

heart failure often develops after other conditions have damaged or weakened your heart. However, the heart doesn't need to be weakened to cause heart failure. It can also occur if the heart becomes too stiff. Over time, the heart can no longer keep up with the normal demands placed on it to pump blood to the rest of your body. An ejection fraction is an important measurement of how well your heart is pumping and is used to help classify heart

failure and guide treatment. In a healthy heart, the ejection fraction is 50 percent or higher — meaning that more than half of the blood that fills the ventricle is pumped out with each beat. But heart failure can occur even with a normal ejection fraction. This happens if the heart muscle becomes stiff from conditions such as high blood pressure. Heart failure can involve the left side (left ventricle), right side (right ventricle) or both sides of your heart. Generally, heart failure begins with the left side, specifically the left ventricle — your heart's main pumping chambe

| Type of heart failure | Description |
|---|---|
| Left-sided heart failure | Fluid may back up in your lungs, causing shortness of breath. |
| Right-sided heart failure | Fluid may back up into your abdomen, legs and feet, causing swelling. |
| Systolic heart failure | The left ventricle can't contract vigorously, indicating a pumping problem. |
| Diastolic heart failure (also called heart failure with preserved ejection fraction) | The left ventricle can't relax or fill fully, indicating a filling problem. |

Any of the following conditions can damage or weaken your heart and can cause heart failure. Some of these can be present without your knowing it:

**Coronary artery disease and heart attack**

Coronary artery disease is the most common form of heart disease and the most common cause of heart failure. The disease results from the buildup of fatty deposits (plaque) in your arteries, which reduce blood flow and can lead to heart attack.

**High blood pressure (hypertension)**

If your blood pressure is high, your heart has to work harder than it should to circulate blood throughout your body. Over time, this extra exertion can make your heart muscle too stiff or too weak to effectively pump blood.[4]

**Faulty heart valves.**

The valves of your heart keep blood flowing in the proper direction through the heart. A damaged valve — due to a heart defect, coronary artery disease or heart infection — forces your heart to work harder, which can weaken it over time.

**Damage to the heart muscle (cardiomyopathy).**

Heart muscle damage (cardiomyopathy) can have many causes, including several diseases, infections, alcohol abuse and the toxic effect of drugs, such as cocaine or some drugs used for chemotherapy. Genetic factors also can play a role.

**Myocarditis.** Myocarditis is an inflammation of the heart muscle. It's most commonly caused by a virus, including COVID-19, and can lead to left-sided heart failure.

**Heart defects you're born with (congenital heart defects).**

If your heart and its chambers or valves haven't formed correctly, the healthy parts of your heart have to work harder to pump blood through your heart, which, in turn, may lead to heart failure.

**Abnormal heart rhythms (heart arrhythmias).**

Abnormal heart rhythms may cause your heart to beat too fast, creating extra work for your heart. A slow heartbeat also may lead to heart failure.

**Other diseases.** Chronic diseases — such as diabetes, HIV, hyperthyroidism, hypothyroidism, or a buildup of iron (hemochromatosis) or protein (amyloidosis) — also may contribute to heart failure.

Causes of acute heart failure include viruses that attack the heart muscle, severe infections, allergic reactions, blood clots in the lungs, the use of certain medications or any illness that affects the whole body.

**Risk factors**

A single risk factor may be enough to cause heart failure.

**High blood pressure.** Your heart works harder than it has to if your blood pressure is high.

**Coronary artery disease.** Narrowed arteries may limit your heart's supply of oxygen-rich blood, resulting in weakened heart muscle.

**Heart attack.** A heart attack is a form of coronary disease that occurs suddenly. Damage to your heart muscle from a heart attack may mean your heart can no longer pump as well as it should.

**Diabetes.** Having diabetes increases your risk of high blood pressure and coronary artery disease..

**Valvular heart disease.** People with valvular heart disease have a higher risk of heart failure.

**Viruses.** A viral infection may have damaged your heart muscle.

**Alcohol use.** Drinking too much alcohol can weaken heart muscle and lead to heart failure.

**Tobacco use.** Using tobacco can increase your risk of heart failure.

**Obesity.** People who are obese have a higher risk of developing heart failure.

**Prevention**

The key to preventing heart failure is to reduce your risk factors. You can control or eliminate many of the risk factors for heart disease — high blood pressure and coronary artery disease, for example — by making lifestyle changes along with the help of any needed medications.

Lifestyle changes you can make to help prevent heart failure include:

- Not smoking
- Controlling certain conditions, such as high blood pressure and diabetes
- Staying physically active
- Eating healthy foods
- Maintaining a healthy weight
- Reducing and managing stress

**Inflammatory Heart Diseases (myocarditis)**

Myocarditis is a disease marked by the inflammation of the heart muscle known as the myocardium — the muscular layer of the heart wall. This muscle is responsible for contracting and relaxing to pump blood in and out of the heart and to the rest of the body. When this muscle becomes inflamed, its ability to pump blood becomes less effective. This causes problems like an abnormal heartbeat, chest pain, or trouble breathing. In extreme cases, it can cause blood clots leading to a heart attack or stroke, damage to the heart with heart failure, or death.[5]

Normally, inflammation is a bodily response to any sort of wound or infection. Imagine when you cut your finger: within a short time, the tissue around the cut swells up and turns red, which are classic signs of inflammation. The immune system in your body is producing special cells to rush to the site of the wound and implement repairs.

**Causes**

In a lot of cases, the exact cause of myocarditis is not found. When the cause of myocarditis is found, it's usually an infection that has made its way to the heart muscle, such as a viral infection (the most common) or a bacterial, parasitic, or fungal infection. As the infection tries to take hold, the immune system fights back, trying to get rid of the disease. This results in an inflammatory response that may weaken heart muscle tissue.

**Viruses** :- According to the Myocarditis Foundation, viruses are one of the most common causes of infectious myocarditis. The most common viruses to cause myocarditis include Coxsackievirus group B

**Bacteria** :-Myocarditis can also result from *infection with Staphylococcus aureus* or *Corynebacterium diptheriae*. *Staphylococcus aureus* is the bacterium that can cause impetigo and be a methicillin resistant strain (MRSA). *Corynebacterium diptheriae is the bacterium that* causes diphtheria, an acute infection that destroys tonsils and throat cells.

**Parasites** :- Parasites are microorganisms that live off of other organisms to survive. They can also cause myocarditis.

**Symptoms**

- ✓ fatigue
- ✓ shortness of breath

- ✓ fever
- ✓ joint pain
- ✓ lower extremity swelling
- ✓ achy feeling in the chest

Many times, myocarditis may subside on its own without treatment, much like a cut on your finger eventually heals. Even some cases that go on for a long time may never create sudden symptoms of heart failure.

**Diagnosis**

blood testing: to check for signs of infection or inflammation sources

**chest X-ray**: to show chest anatomy and potential signs of heart failure

**electrocardiogram (ECG)**: to detect abnormal heart rates and rhythms that may indicate a damaged heart muscle

**echocardiogram (**ultrasound imaging of the heart**)**: to help detect structural or functional issues in the heart and adjacent vessels

**Prevention:-**

- practicing safe sex
- staying up to date with vaccinations

**Pulmonary Heart Diseases: -**

Pulmonary hypertension is a type of high blood pressure that affects the arteries in your lungs and the right side of your heart.[6] In one form of pulmonary hypertension, called pulmonary arterial hypertension (PAH), blood vessels in your lungs are narrowed, blocked or destroyed. The damage slows blood flow through your lungs, and blood pressure in the lung arteries rises. Your heart must work harder to pump blood through your lungs. The extra effort eventually causes your heart muscle to become weak and fail. In some people, pulmonary hypertension slowly gets worse and can be life-threatening. Although there's no cure for some types of pulmonary hypertension, treatment can help reduce symptoms and improve your quality of life.

**Symptoms**

The signs and symptoms of pulmonary hypertension develop slowly. You may not notice them for months or even years. Symptoms get worse as the disease progresses.

Pulmonary hypertension symptoms include:

- ❖ Shortness of breath (dyspnea), initially while exercising and eventually while at rest
- ❖ Fatigue
- ❖ Dizziness or fainting spells (syncope)
- ❖ Chest pressure or pain
- ❖ Swelling (edema) in your ankles, legs and eventually in your abdomen (ascites)
- ❖ Bluish color to your lips and skin (cyanosis)
- ❖ Racing pulse or heart palpitations

**Causes**

Your heart has two upper chambers (atria) and two lower chambers (ventricles). Each time blood passes through your heart, the lower right chamber (right ventricle) pumps blood to your lungs through a large blood vessel (pulmonary artery).

In your lungs, the blood releases carbon dioxide and picks up oxygen. The blood normally flows easily through blood vessels in your lungs (pulmonary arteries, capillaries and veins) to the left side of your heart. However, changes in the cells that line your pulmonary arteries can cause the walls of the arteries to become stiff, swollen and thick. These changes may slow down or block blood flow through the lungs, causing pulmonary hypertension.

Pulmonary hypertension is classified into five groups, depending on the cause

**Group 1: Pulmonary arterial hypertension (PAH)**

- ✓ Unknown cause (idiopathic pulmonary arterial hypertension)
- ✓ A genetic mutation passed down through families (heritable pulmonary arterial hypertension)
- ✓ Use of some prescription diet drugs or illegal drugs such as methamphetamines — and other drugs

- ✓ Heart problems present at birth (congenital heart disease)
- ✓ Other conditions, such as connective tissue disorders (scleroderma, lupus, others), HIV infection or chronic liver disease (cirrhosis)

**Group 2: Pulmonary hypertension caused by left-sided heart disease**

- ✓ Left-sided heart valve disease, such as mitral valve or aortic valve disease
- ✓ Failure of the lower left heart chamber (left ventricle)

**Group 3: Pulmonary hypertension caused by lung disease**

- ✓ Chronic obstructive pulmonary disease (COPD)
- ✓ Pulmonary fibrosis, a condition that causes scarring in the tissue between the lungs' air sacs (interstitium)
- ✓ Obstructive sleep apnea
- ✓ Long-term exposure to high altitudes in people who may be at higher risk of pulmonary hypertension

**Group 4: Pulmonary hypertension caused by chronic blood clots**

Chronic blood clots in the lungs (pulmonary emboli)

**Risk factors**

Growing older can increase your risk of developing pulmonary hypertension. The condition is more often diagnosed in people ages 30 to 60. However, idiopathic PAH is more common in younger adults.

**Treatment**

The treatment for cor pulmonale can include the following: antibiotics, expectorants, oxygen therapy, diuretics, digitalis, vasodilators, and anticoagulants. Some studies have indicated that Shenmai injection with conventional treatment is safe and effective for cor pulmonale (chronic) .

Anticoagulants are used when venous thromboembolism is present. Venesection is used in severe secondary polycythemia, which improves symptoms though survival rate has not been proven to increase. Finally, transplantation of single/double lung in extreme cases of cor pulmonale is also an option.

**Heart Valve Diseases**

In heart valve disease, one or more of the valves in your heart doesn't work properly.

Your heart has four valves that keep blood flowing in the correct direction. In some cases, one or more of the valves don't open or close properly. This can cause the blood flow through your heart to your body to be disrupted.

Your heart valve disease treatment depends on the heart valve affected and the type and severity of the valve disease. Sometimes heart valve disease requires surgery to repair or replace the heart valve.[7]

**Symptoms**

Some people with heart valve disease might not experience symptoms for many years. Signs and symptoms of heart valve disease may include:

- Abnormal sound (heart murmur) when a doctor is listening to the heart beating with a stethoscope
- Chest pain
- Abdominal swelling (more common with advanced tricuspid regurgitation)
- Fatigue
- Shortness of breath, particularly when you have been very active or when you lie down
- Swelling of your ankles and feet
- Dizziness
- Fainting
- Irregular heartbeat

**Causes**

your heart has four valves that keep blood flowing in the correct direction. These valves include the mitral valve, tricuspid valve, pulmonary valve and aortic valve. Each valve has flaps (leaflets or cusps) that open and close once during each heartbeat. Sometimes, the valves don't open or

close properly, disrupting the blood flow through your heart to your body.

Heart valve disease may be present at birth (congenital). It can also occur in adults due to many causes and conditions, such as infections and other heart conditions

heart valve problems may include:

**Regurgitation**

In this condition, the valve flaps don't close properly, causing blood to leak backward in your heart. This commonly occurs due to valve flaps bulging back, a condition called prolapse.

**Stenosis.** In valve stenosis, the valve flaps become thick or stiff, and they may fuse together. This results in a narrowed valve opening and reduced blood flow through the valve.

**Atresia.** In this condition, the valve isn't formed, and a solid sheet of tissue blocks the blood flow between the heart chambers.

**Risk factors:-**

Several factors can increase your risk of heart valve disease, including:

- Older age
- History of certain infections that can affect the heart
- History of certain forms of heart disease or heart attack
- High blood pressure, high cholesterol, diabetes and other heart disease risk factors
- Heart conditions present at birth (congenital heart disease)

**Coronary Artery Diseases**

Coronary artery disease (CAD) causes impaired blood flow in the arteries that supply blood to the heart. Also called coronary heart disease (CHD), CAD is the most common form of heart disease and affects approximately 16.5 million Americans over the age of 20.

It's also the leading cause of death for both men and women in the United States. It's estimated that every 40 seconds, someone in the United States has a heart attack.A heart attack can come from uncontrolled CAD.

**Causes of coronary artery disease**

- The most common cause of CAD is vascular injury with cholesterol plaque buildup in the arteries, known as atherosclerosis. Reduced blood flow occurs when one or more of these arteries becomes partially or completely blocked.
- The four primary coronary arteries are located on the surface of the heart:
- Right main coronary artery
- Left main coronary artery
- Left circumflex artery
- Left anterior descending artery
- These arteries bring oxygen and nutrient-rich blood to your heart. Your heart is a muscle that's responsible for pumping blood throughout your body. According to the Cleveland Clinic, a healthy heart moves approximately 3,000 gallons of blood through your body every day.

Like any other organ or muscle, your heart must receive an adequate, dependable supply of blood in

**Symptoms of CAD**

When your heart doesn't get enough arterial blood, you may experience a variety of symptoms. Angina (chest discomfort) is the most common symptom of CAD. Some people describe this discomfort as:

- Chest pain
- Heaviness
- Tightness
- Burning
- Squeezing
- These symptoms can also be mistaken for heartburn or indigestion.
- Other symptoms of CAD include:
- Pain in the arms or shoulders
- Shortness of breath
- Sweating

- Dizziness

You may experience more symptoms when your blood flow is more restricted. If a blockage cuts off blood flow completely or almost completely, your heart muscle will start to die if not restored. This is a heart attack.Don't ignore any of these symptoms, especially if they are excruciating or last longer than five minutes. Immediate medical treatment is necessary.

**Heart Diseases**

Ischemic heart disease is a condition of recurring chest pain or discomfort that occurs when a part of the heart does not receive enough blood. This condition occurs most often during exertion or excitement, when the heart requires greater blood flow. Ischemic heart disease, also called coronary heart disease, is common in the United States and is a leading cause of death worldwide. Ischemic heart disease develops when cholesterol particles in the blood begin to accumulate on the walls of the arteries that supply blood to the heart. Eventually, deposits called plaques may form. These deposits narrow the arteries and eventually block the flow of blood. This decrease in blood flow reduces the amount of oxygen supplied to the heart muscle. The signs and symptoms of ischemic heart disease may develop slowly as arteries gradually become blocked, or they may occur quickly if an artery suddenly becomes blocked. Some people with ischemic heart disease have no symptoms at all, while others may have severe chest pain (angina) and shortness of breath that can pose a risk of heart attack.

**Common symptoms of ischemic heart disease:-**

- ❖ May feel as if pain starting in the chest spreads to the arms, back, or other areas
- ❖ May feel like gas or indigestion (more common in women)
- ❖ Occurs repeatedly; episodes tend to be alike
- ❖ Occurs when the heart must work harder, usually during physical exertion
- ❖ Usually lasts a short time (five minutes or less)

**Factors for ischemic heart disease**

- ❖ A number of factors increase the risk of developing ischemic heart disease. Not all people with risk factors will get ischemic heart disease. Risk factors for ischemic heart disease include:
- ❖ Diabetes
- ❖ Family history of heart disease
- ❖ High blood cholesterol
- ❖ High blood pressure
- ❖ High blood triglycerides
- ❖ Obesity

**Treatment**

- ❖ Medication used to treat ischemic heart disease :-
- ❖ Drug therapy Is commonly used for treatment of ischemic heart disease and includes:
- ❖ Angiotensin-converting enzyme (ACE) inhibitors, which relax the blood vessels and lower blood pressure
- ❖ Angiotensin receptor blockers (ARBs), which lower blood pressure
- ❖ Anti-ischemic agents such as ranolazine (Ranexa)

**Hypertensive Heart Diseases**

Hypertensive Heart Disease is the name given to a collection of diseases caused due to hypertension. As stated it is not a single disease condition, but a collection of various disorders related to a single medical condition which in this case is hypertension. Some of the medical conditions which come under Hypertensive Heart Disease are heart failure and coronary artery disease. Hypertensive Heart Disease if ignored can be potentially life

**The classification of blood pressure**

- ✓ Systolic pressure (SBP): It is the maximum pressure recorded durin entncular systole.
- ✓ Diastolic blood pressure (DBP): It is the minimum pressure recorded duHng ventricular diastole.

- ✓ Pulse pressure (PP): It is the difference between systolic and diastolic blood pressure (PP = SBP DBP)
- ✓ Mean arterial pressure: DBP + 1/3 PP.

**Drugs Used in Cardiovascular Diseases**

- ✓ There are many drugs prescribed for heart disease. It's important for people with heart disease and those who care for them to understand the meds, follow the labels, and recognize possible side effects.
- ✓ The ones most people with heart disease are given by their doctor include:
- ✓ ACE inhibitors: These widen arteries to lower your blood pressure and make it easier for your heart to pump blood.
- ✓ Aldosterone inhibitors: Eplerenone (Inspra) and spironolactone (Aldactone) are part of a class of medicine called potassium-sparing diuretics. They can ease the swelling and water buildup heart disease can cause. They help the kidneys send unneeded water and salt from your tissues and blood into your urine to be released.
- ✓ These drugs may help some symptoms, even while you take other treatments. They protect your heart by blocking a chemical in your body called aldosterone that causes salt and fluid buildup.This medicine is for folks with some types of severe heart failure.
- ✓ Angiotensin II receptor blockers (ARBs): These are used to lower blood pressure for people with heart failure. They help keep your blood vessels as wide as possible so blood can flow through your body more easily. They also lessen salt and fluid buildup in your body.
- ✓ Beta-blockers: They block the effects of adrenaline (epinephrine). This helps your heart work better. These meds also drop production of harmful substances your body makes in response to heart failure. And they cause your heart to beat slower and with less force. Those both lower your blood pressure.
- ✓ calcium channel blockers: These treat chest pain (your doctor may say “angina”) and high blood pressure. They relax blood vessels and increase blood and oxygen to your heart. That eases its workload. They’re used only when other medicines to lower blood pressure don’t work. Ask your doctor if one is right for you.
- ✓ Cholesterol-lowering drugs: Cholesterol helps your body build new cells, insulate nerves, and make hormones. But inflammation may force cholesterol to build up in the walls of your arteries. That buildup increases your chance of having a heart attack or stroke.
- ✓ Digoxin (cardiotonic) :- it helps an injured or weakened heart to send blood through the body and work more efficiently. It strengthens the force of the heart muscle's contractions. It may improve blood circulation.
- ✓ You may be prescribed this if you have an irregular heartbeat (your doctor may call this atrial fibrillation, or AFib). It may help slow down your heart rate.
- ✓ □ Diuretics: You may know these as water pills. They help your kidneys get rid of unneeded water and salt from your tissues and bloodstream. That makes it easier for your heart to pump. They treat high blood pressure and ease swelling and water buildup caused by some medical problems, including heart failure. They also help make breathing easier.
- ✓ Inotropic therapy: This helps make an injured or weakened heart pump harder to send blood through the body. Administered through IV, it helps strengthen the heart muscle's contractions. It also relaxes constricted blood vessels so blood can flow more smoothly. Inotropic therapy may also speed up your heart's rhythm.
- ✓ potassium or magnesium: You can lose these electrolytes when you pee more while you take diuretics. That loss can cause abnormal heart

rhythms. Ask your doctor if you should take supplements to make up the difference.

- ✓ Proprotein convertase subtilisin kexin type 9 (PCSK9) inhibitors: You mayget this new class of cholesterol-lowering drugs if diet and statin treatments aren't helping. They block a liver protein called PCSK9. That protein hinders your liver's ability to get rid of LDL (bad) cholesterol.
- ✓ Vasodilators: These relax your blood vessels so blood can flow more easily through your body. You'll get these if you can't take ACE inhibitors.

Warfarin: This helps prevent clots from forming in your blood. You'll get it if your body is making blood clots, or if you have a condition that helps causethem.This medicine won't dissolve a blood clot. Over time, the clot may dissolve on its own. Warfarin may also prevent others froming .

## CONCLUSIONS

Member States are urged to initiate national programmes aiming at the prevention of CVD and reducing their enormous social and economic costs. Ministries of health should be asked to allocate appropriate resources for these programmes, establish a national committee if it does not already exist, and appoint a focal person (or point) responsible for the coordination of programme activities.

Both Member States and WHO should consider the development of community-based demonstration projects on the primary prevention of CVD and other major noncommunicable diseases such as diabetes and cancer to test intervention methods, to generate public awareness and to serve as models for nationwide replication.

Member States should assess the availability of minimum standards of health care for people with established CVD. Appropriate measures should be taken to ensure the availability of the essential elements of health care at the various levels of care and at affordable costs. The role of primary health care in the prevention and management of CVD should be strengthened.

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