

Complications of hypertension

Complications of hypertension are the leading cause of cardiovascular diseases and death. The major causes of death from uncontrolled or poorly controlled hypertension are stroke, kidney failure, heart failure, and blood vessel disease (peripheral vascular disease and coronary heart disease).

What is uncontrolled hypertension?

Uncontrolled hypertension is a major cause of complications arising from high blood pressure. Hypertension is said to be uncontrolled if it remains persistently high with or without treatment. This may be either because of poor adherence to medications or poor lifestyle choices that make blood pressure difficult to control. Sometimes, it may be because the medications being used are unable to reduce blood pressure on their own. In this case, other blood pressure medications will be added or changed until blood pressure is reduced.

What happens when your BP is high for a long time?

Uncontrolled hypertension leads to complications and damage to the blood vessels of the body, such as the veins or arteries. When the blood vessels supplying blood to an organ are damaged, it reduces the amount of blood flowing to that organ, and this will lead to organ damage. These organ damages are called complications. They affect the brain, eyes, heart, kidneys, etc.

Complications of hypertension

1. Eye complications

High blood pressure affects different parts of the eyes including the retina and the optic nerves. Hypertension can cause disease in the retina which is the tissue at the back of your eyes that receives the picture of what you see and then sends it to your brain for interpretation through the optic nerve. The optic nerve connects your eyes to your brain. Every image you see has passed through the retina and optic nerve to your brain before you recognise it.

Hypertensive [retinopathy](#) may start with blurred vision as the first symptom. In hypertension, the vessels that supply blood to the retina bulge out (aneurysms) which increases the risk of rupture. They may become hard, thickened and less flexible, which eventually causes them to become occluded or burst.

New fragile blood vessels may form as a way to compensate for the reduced blood flow through retinal arteries and veins. Unfortunately, these new blood vessels can break easily and bleed into the eye which causes visual impairment.

As systolic BP increases, the risk of retinal blood vessel disease increases. Persistent high BP can make the blood vessels of the retina narrower and it may get blocked altogether

(retinal artery or vein occlusion) resulting in visual impairment. Uncontrolled hypertension may also contribute to an increase in the pressure within the eyes (intraocular pressure) and glaucoma. Hypertension also worsens retinal disease from diabetes mellitus.

2. Heart complications

Hypertension affects different parts of the heart such as; 1) the blood vessels that supply oxygen and blood to the heart muscles; 2) the large blood vessels that take blood from the heart to other parts of the body and; 3) the muscles of the heart.

Complications of hypertension that [affect the heart](#) include coronary heart disease, heart attack (myocardial infarction), aortic aneurysm, atrial fibrillation and heart failure.

- 1) Aortic aneurysm: Hypertension can cause the aorta, a large blood vessel that takes oxygenated blood away from the heart to other body parts, to bulge at the sides due to weakness of the walls (aortic aneurysm). The area that bulges out becomes the point through which the vessel ruptures if the aneurysm is not discovered and corrected promptly. Bleeding from such a large blood vessel causes chest pain and can lead to death in a matter of minutes from when it ruptures, particularly if it is a large rupture.
- 2) Coronary heart disease: The coronary arteries supply blood and oxygen to the heart muscles, and in hypertension, these vessels may become thickened and narrowed (coronary heart disease). An individual with coronary heart disease will have chest pain when they attempt to exercise or do strenuous activities. This chest pain stops when the person is at rest. This is because the heart pumps faster with exercise. When the heart pumps faster, the muscles need more oxygen, which cannot be delivered adequately through the narrow or partially occluded arteries. The chest pain is relieved by rest because rest reduces the high need for oxygen. When a coronary artery becomes completely blocked, a part of the heart muscle is deprived of oxygen long enough for it to die (myocardial infarction). A heart attack occurs commonly in those who have coronary heart disease. Also called a myocardial infarction (MI), a heart attack is a cause of sudden onset severe chest pain not relieved by rest and may lead to death.

3. Renal (Kidney) complications of hypertension

Hypertension can cause narrowing and scarring of kidney arteries, thereby reducing blood flow to the kidneys. This also affects the tiny blood vessels inside the kidney that filter out toxic substances from the body. When these blood vessels become narrowed, they do not perform the filtration function properly. Over time, the kidneys start to malfunction and then protein starts to leak into the urine (proteinuria). This is the onset of chronic kidney disease which is progressive. Initially, the individual may have no symptoms but as the disease progresses to end-stage renal disease which is the final stage, the individual will need

dialysis- a procedure that mimics the function of the kidneys. Dialysis is only a temporary solution while awaiting a kidney transplant. The progression to end-stage renal disease is even faster in older adults because age contributes to scarring of the renal arteries.

4. Brain/nerve complications of hypertension

- A stroke happens when a blood vessel in the brain suddenly becomes completely blocked (Ischaemic stroke) or ruptures (haemorrhagic stroke).
- Hypertensive encephalopathy is a condition characterised by markedly elevated blood pressure, generalised seizures (in some cases), confusion and an altered level of consciousness.
- Hypertension increases the risk of both Alzheimer's and vascular dementia. Dementia means impairment in cognitive function that interferes with a person's ability to carry out their normal daily activities without assistance. In dementia, memory is particularly affected but other cognitive domains such as language, orientation, attention, concentration and registration may also be impaired. Vascular dementia is a type of dementia characterised by recurrent ischaemic strokes which may or may not have been symptomatic. People who have vascular dementia have many silent strokes. Silent strokes are little blockages in small vessels of the brain that do not have the typical sudden symptoms of a stroke. They are most often discovered incidentally. As the likelihood of dementia increases with age, the vascular consequences of hypertension also progress with age, hence the higher chances of vascular dementia in older adults. [Research](#) has shown that active treatment of hypertension is associated with some reduction in the number of people newly diagnosed with cognitive impairment.

5. Peripheral arterial disease (PAD) or peripheral vascular disease

This may happen in prolonged hypertension as blood vessels that supply the limbs, pelvis and other parts of the body become narrow. Some of these vessels also supply the nerves with oxygen, therefore low blood flow through them will cause nervous system symptoms such as pain, reduced sensation or loss of sensation in the areas affected by peripheral vascular disease. Some people do not have any symptoms. PAD can be serious and may lead to further complications, such as wounds that take a longer time to heal (chronic ulcers), skin infections, erectile dysfunction (inability to sustain an erection of the penis long enough for penetration), and increased risk of limb amputation.