



## **A Guide to Understanding Hypertension**



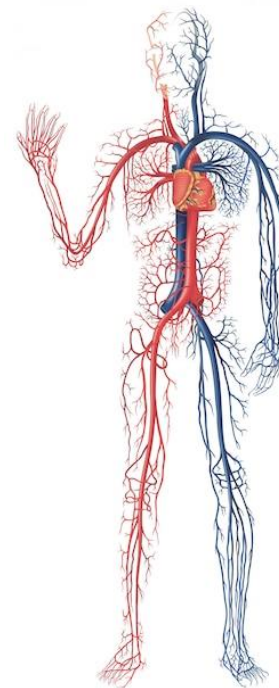
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## What is the Circulatory System?

Your heart and blood vessels make up the circulatory system. The main function of the circulatory system is to provide oxygen, nutrients and hormones to muscles, tissues and organs throughout your body. Another part of the circulatory system is to remove waste from cells and organs so your body can dispose of it.

Your heart pumps blood to the body through a network of arteries and veins (blood vessels). Your circulatory system can also be defined as your cardiovascular system. Cardio means heart, and vascular refers to blood vessels.



## What Is Hypertension?

Blood pressure is a measure of the force that your heart uses to pump blood around your body. High blood pressure is when the force of blood pushing against your artery walls is consistently too high. This damages your arteries over time and can lead to serious complications like heart attack and stroke.

“**Hypertension**” is another word for this common condition.



### Did You Know?

- φ An estimated **128 crores** adults aged 30–79 years worldwide have hypertension, most (two-thirds) living in low- and middle-income countries.
- φ An estimated **46%** of adults with hypertension are unaware that they have the condition.
- φ **Less than half** of adults (42%) with diagnosed hypertension are treated.
- φ Approximately **1 in 5 adults** (21%) with hypertension have it under control.
- φ Hypertension is a major cause of premature death worldwide.

## Risk Factors for Hypertension

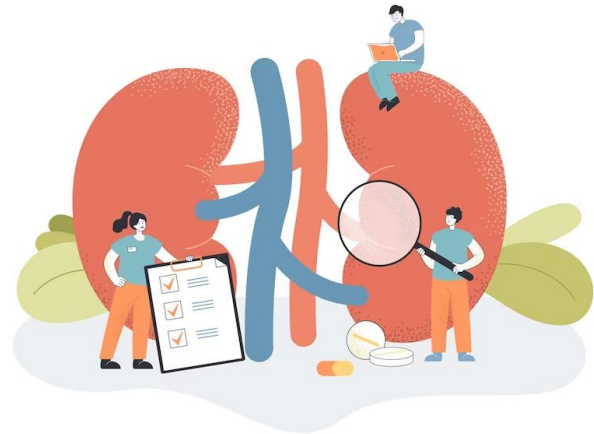
Primary hypertension is the most common type of hypertension. It is generally caused by aging and lifestyle factors such as:

- φ Older age (over age 55)
- φ Genetics
- φ Being overweight
- φ Being physically inactive
- φ Taking a high-salt diet
- φ Drinking too much alcohol
- φ Insufficient sleep (<7 hours per night)
- φ Tobacco use



Secondary hypertension is generally caused by medical conditions or a medication you're taking. Possible causes are:

- φ Adrenal gland tumors
- φ Blood vessel problems present at birth
- φ Kidney disease
- φ Obstructive sleep apnea
- φ Thyroid problems
- φ Metabolic syndrome
- φ Cough and cold medicines, some pain relievers, birth control pills, steroids, NSAIDS, decongestants, anti-depressants
- φ Illegal drugs, such as cocaine and amphetamines



## Symptoms of Hypertension

Most people with hypertension don't feel any symptoms. It is for this reason that high blood pressure is called a **'silent killer'**. So, you may not be aware that anything is wrong, but the damage is still occurring within your body. So, checking your blood pressure is the best way to know if you have high blood pressure.

People with very high blood pressure (180/120 mm Hg or higher) can experience symptoms including:

Severe headaches  
Dizziness  
Nausea  
Anxiety  
Buzzing in the ears  
Abnormal heart rhythm



Chest pain  
Difficulty breathing  
Vomiting  
Confusion  
Nosebleeds  
Blurred vision

## Complications of Hypertension

Managing your hypertension is very important. Over time, hypertension can damage the arteries and decrease blood flow to parts of the body, including the brain, heart, and kidneys. Having untreated or uncontrolled hypertension can lead to:

- φ **Heart attack** - caused from hardened and thickened arteries due to high blood pressure.
- φ **Stroke** - caused from hardened and thickened arteries due to high blood pressure.
- φ **Aneurysm** – caused from increased blood pressure rendering the blood vessel to weaken and bulge. If an aneurysm ruptures, it can be life-threatening.







- φ **Heart failure** - as 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.
- φ **Kidney damage** - high blood pressure can cause the blood vessels in the kidneys to become narrow or weak.
- φ **Eye damage** - an increased blood pressure can cause thickened, narrowed or torn blood vessels in the eyes. This can result in vision loss.
- φ **Vascular dementia** - narrowed or blocked arteries can limit blood flow to the brain. A stroke that interrupts blood flow to the brain also can cause vascular dementia leading to memory and concentration problems.

## What Are Different Values for Diagnosing Hypertension?

A blood pressure reading is written as two numbers, a higher number over a lower number.

- φ The first, or top, number is called the systolic pressure. It is a measure of the pressure in your arteries as your heart beats.
- φ The second, or bottom number, is called the diastolic pressure. It is a measure of the pressure in your arteries as the heart relaxes.
- φ Your personal target blood pressure may vary depending on your medical conditions, your age, and other factors.
- φ You may have also heard about high blood pressure that comes or goes in certain situations, like:
  - φ **White coat hypertension:** Your BP is normal at home but elevated in a healthcare setting.
  - φ **Masked hypertension:** Your BP is normal in a healthcare setting but elevated at home.
  - φ **Sustained hypertension:** Your BP is elevated in healthcare settings and at home.
  - φ **Nocturnal hypertension:** Your BP goes up when you sleep.





Based on your blood pressure reading, your doctor may use the following levels to determine what type of treatment is best for you.

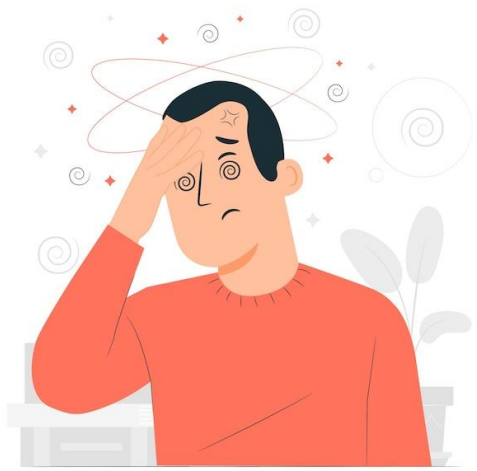
<b>BP level</b>	<b>Systolic pressure</b>		<b>Diastolic pressure</b>
Normal	< 120	And	<80
Elevated	120 - 129	And	<80
Hypertension stage 1	130 - 139	Or	80 - 89
Hypertension stage 2	140 or above	Or	90 or above
Hypertensive emergency	180 or above	Or	120 or above

To start medicines for hypertension, your blood pressure must be more than or equal to 140/90 mmHg on two separate occasions.

## What Is Hypertensive Emergency?

A hypertensive emergency is an acute, marked elevation in blood pressure that is associated with signs of target-organ damage. These can include pulmonary edema, cardiac ischemia, neurologic deficits, acute renal failure, aortic dissection, and eclampsia.

- ϕ When people have a high blood pressure emergency, their blood pressure is usually **'180/120 mmHg' or higher**.
- ϕ Without treatment right away, these problems can lead to death.
- ϕ Sometimes, a person's blood pressure is much higher than normal, but it hasn't damaged any organs. Doctors call this 'hypertensive urgency'. Hypertensive urgency is not usually treated the same as a high blood pressure emergency.



## What Are Symptoms of Hypertensive Emergency?

The symptoms depend on the organs affected. They can include:

- φ Weakness or numbness on 1 side of the body, or in 1 arm or leg
- φ Blurry vision or other vision changes
- φ Headache
- φ Nausea or vomiting
- φ Confusion
- φ Difficulty talking
- φ Trouble breathing
- φ Chest pain
- φ Pain in the upper back or between the shoulders
- φ Brown or bloody urine
- φ Pain in the lower back or on one side of the body
- φ Passing out or seizures



## Tests for Hypertensive Patients

Patients with hypertension should have regular check-ups of not only their blood pressure but also their vital organs to prevent any long-term damage.

**Lab tests** - Blood and urine tests are done to check for conditions that can cause or worsen high blood pressure.

- φ Complete blood count
- φ Lipid profile
- φ Serum creatinine
- φ Fasting glucose
- φ Electrolytes
- φ Thyroid-stimulating hormone
- φ Urinalysis
- φ Urinary albumin to creatinine ratio.





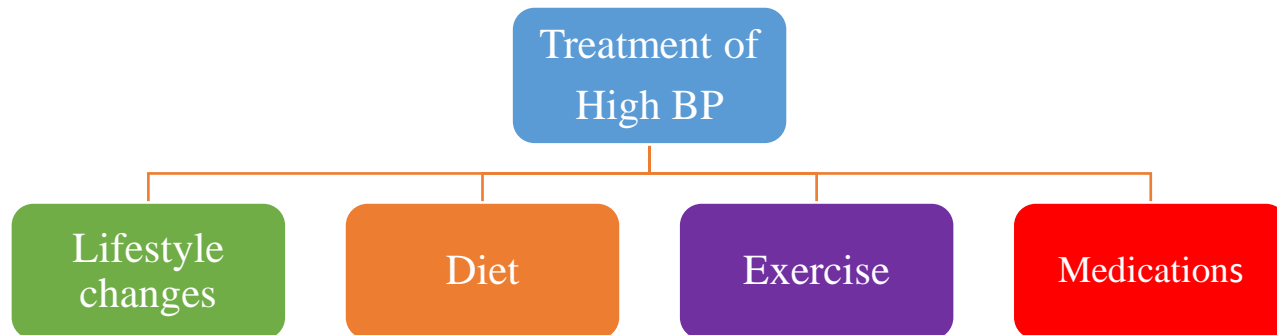
**Electrocardiogram (ECG)** - This quick and painless test measures the heart's electrical activity. It can tell how fast or how slow the heart is beating.

**Echocardiogram** - This non-invasive test uses sound waves to create detailed images of the beating heart. It shows how blood moves through the heart and heart valves.

**USG abdomen and renal doppler** – For young patients with very high blood pressure not responding to medicines. This will show if there are any structural abnormalities causing the hypertension.

## Treatment

Management of hypertension requires holistic approach which includes dietary and lifestyle changes along with taking medicines. Your doctor will help you make a plan to bring your blood pressure within a normal range. You may be referred for counseling on a healthy diet and physical activity.





## Lifestyle Changes

φ **Maintain a healthy weight** - If you're overweight, losing weight can help control blood pressure and lower the risk of complications. Ask your doctor what weight is best for you. In general, blood pressure drops by about 1 mmHg per kilogram of weight lost. In people with high blood pressure, the drop in blood pressure may be even more significant per kilogram.



- φ **Manage stress** - Identify your sources of stress and find ways to help reduce emotional stress. Getting more exercise, practicing mindfulness, deep breathing, meditation and connecting with others in support groups are some ways to reduce stress.
- φ **Try slow, deep breathing** - Practice taking deep, slow breaths to help relax. Some research shows that slow, paced breathing (5 to 7 deep breaths per minute) combined with mindfulness techniques can reduce blood pressure.

- φ **Avoid alcohol** - Even if you're healthy, alcohol can raise your blood pressure.
- φ **Don't smoke** - Tobacco injures blood vessel walls and speeds up the process of hardening of the arteries. If you smoke, we understand that quitting is not easy, ask your doctor for strategies to help you.
- φ **Practice good sleep habits** - Poor sleep may increase the risk of heart disease and other chronic conditions. Adults should aim to get 7 to 9 hours of sleep daily. Kids often need more. Go to bed and wake at the same time every day, including on weekends. If you have trouble sleeping, talk to your doctor about strategies that might help.
- φ **Medical conditions** - Control any chronic conditions you have, such as high cholesterol or diabetes.



## Diet

A commitment to a healthy lifestyle can help prevent and manage high blood pressure. Try these heart-healthy strategies:

### ☐ **Eat a healthy diet.**

Try the Dietary Approaches to Stop Hypertension (DASH) diet.

- Eat plenty of fresh fruits and vegetables. Try to fill one-half of your plate at each meal with fruits and vegetables.
- Eat whole grains, such as whole-wheat pasta, brown rice, or whole-grain bread. Fill about one-fourth of your plate with whole grains.
- Eat low-fat dairy products.
- Fill about one-fourth of your plate with lean proteins such as beans and tofu.
- Use less salt. Processed canned foods, commercial soups, frozen dinners and certain breads can be hidden sources of salt. Check food labels for the sodium content. Limit foods and beverages that are high in sodium. Salt intake of 5 gm a day or less (i.e 1 teaspoon) is considered ideal for most adults. But ask your doctor what's best for you.



## Exercise

- φ Work with your doctor to maintain a healthy body weight or to lose weight. Ask what an ideal weight is for you.
- φ Consistent moderate to high-intensity workouts can lower your top blood pressure reading by about 11 mm Hg and the bottom number by about 5 mm Hg.
- φ Get at least 30 minutes of exercise that causes your heart to beat faster (aerobic exercise) most days of the week. Activities may include fast walking, swimming, or cycling.
- φ Include exercise to strengthen your muscles (resistance exercise), such as weight lifting, as part of your weekly exercise routine. Try to do these types of exercises for 30 minutes at least 3 days a week.



## Medications

Your doctor may prescribe medicine if lifestyle changes are not enough to get your blood pressure under control. i.e if your systolic blood pressure is 140 or higher or diastolic blood pressure is 90 or higher

Starting blood pressure medicines becomes even more important if you have the following:

- φ Type 2 diabetes mellitus
- φ Chronic kidney disease
- φ Established clinical cardiovascular disease, heart failure, carotid disease, previous stroke, or peripheral arterial disease
- φ Age 65 years or older





Medications prescribed to you may be:

- φ **Angiotensin-converting enzyme (ACE) inhibitors** and **Angiotensin II receptor blockers (ARBs)** are medications that prevent blood vessel narrowing.
- φ **Beta blockers** slow your heart rate and reduce the heart's output, which lowers blood pressure.
- φ **Calcium channel blockers** decrease the amount of calcium in the blood vessels. This helps muscle tissue relax to relieve narrowing.
- φ **Diuretics** help the body eliminate excess water and sodium.
- φ **Vasodilators** help muscles in blood vessel walls relax, making it easier for blood to flow through them.

There are many more medications available that work by other such mechanisms to reduce your blood pressure. **Modern day medications have minimal or no side effects.** Take medicines only as told by your doctor. Follow the directions carefully. The medicine does not work when you skip doses. Skipping doses also puts you at risk for problems.

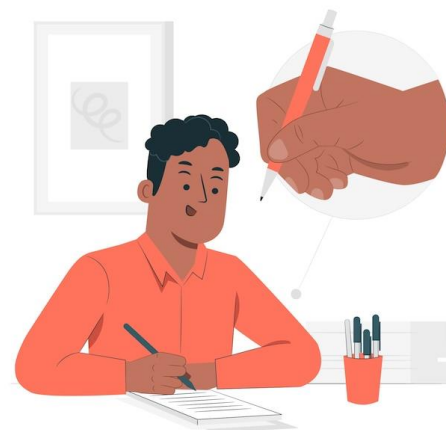
## Preparing for Your Appointment

- φ If you think you may have high blood pressure, make an appointment with your doctor for a blood pressure test.
- φ No special preparations are necessary for a blood pressure test. To get an accurate reading, avoid caffeine, exercise and tobacco for at least 30 minutes before the test.
- φ You can wear a short-sleeved shirt to your appointment so it's easier to place the blood pressure cuff around your arm.
- φ Because some medicines can raise blood pressure, bring a list of all medicines, vitamins and other supplements you take and their doses to your medical appointment. Don't stop taking any medicines without your doctor's advice.
- φ Appointments can be brief. Because there's often a lot to discuss, it's a good idea to be prepared for your appointment.



## What You Can Do

- φ **Write down any symptoms that you're having.** High blood pressure rarely has symptoms, but let your doctor know if you have symptoms such as chest pains or shortness of breath.
- φ **Write down family history** of high blood pressure, high cholesterol, heart disease, stroke, kidney disease or diabetes, and any major stresses or recent life changes.
- φ **Make a list of all medicines,** vitamins or ayurvedic supplements that you're taking. Include dosages and frequency so they can be reviewed by your doctor during the appointment.
- φ **Be prepared to discuss your diet and exercise habits.** If you don't already follow a diet or exercise routine, be ready to talk to your doctor about any challenges you might face in getting started.





- ϕ **Take a family member or friend along**, if possible. Sometimes it can be difficult to remember all the information provided to you during an appointment. Someone who accompanies you may remember something that you missed or forgot.

### **Write Down Questions to Ask Your Doctor.**

Preparing a list of questions can help you and your doctor make the most of your time together. List your questions from most important to least important in case time runs out. For high blood pressure, some basic questions to ask your doctor include:

- ϕ What kinds of tests will I need?
- ϕ What is my blood pressure goal?
- ϕ Do I need any medicines?
- ϕ What foods should I eat or avoid?
- ϕ What's an appropriate level of physical activity?





- φ How often do I need to schedule appointments to check my blood pressure?
- φ Should I monitor my blood pressure at home?
- φ I have other health conditions. How can I best manage them together?
- φ Are there brochures or other printed material that I can have? What websites do you recommend?

### **What to Expect From Your Doctor**

Your doctor is likely to ask you questions such as:

- φ Do you have a family history of high cholesterol, high blood pressure or heart disease?
- φ What are your diet and exercise habits like?
- φ Do you drink alcohol? How many drinks do you have in a week?
- φ Do you smoke?
- φ When did you last have your blood pressure checked? What was the result?

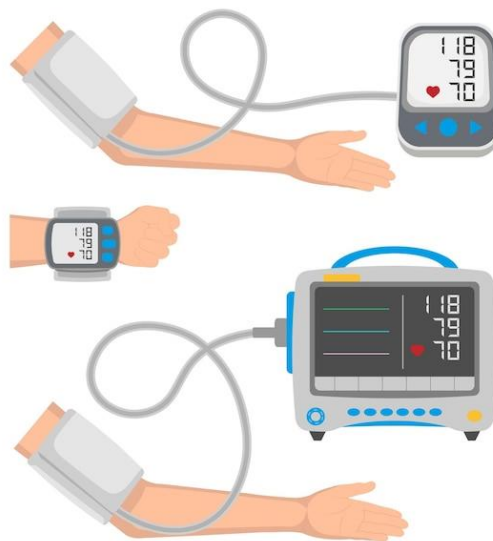
## BP Monitoring – How to Check BP at Home

Once you are diagnosed to have hypertension, you may require to check blood pressure at timely interval. Also sometimes, the blood pressure might become low – known as hypotension.

To distinguish whether your symptoms are because of high blood pressure or low blood pressure, it is best to have a blood pressure measuring instrument at home.

There are many options of BP monitoring instruments available for home use

- φ Digital arm blood pressure machine
- φ Wrist blood pressure machine
- φ Aneroid blood pressure machine
- φ Mercury blood pressure machine



## Before you monitor your blood pressure:

- ∅ Ensure the batteries in your BP instrument are not low.
- ∅ Do not smoke, drink caffeinated beverages, or exercise within 30 minutes before taking a measurement.



- ∅ Use the bathroom and empty your bladder.
- ∅ Sit quietly for at least 5 minutes before taking measurements.
- ∅ Sit with your back straight and supported.
- ∅ Place your feet flat on the floor. Do not cross your legs.
- ∅ Remove any clothing between your arm and the BP cuff.
- ∅ Wrap the cuff above the elbow. Ensure that two fingers can easily slide under the cuff, once you have tied it on.

- ∅ Ensure the wire attached to the cuff is face up and in the direction of your palm, not your shoulder.



- φ Support your arm on a flat surface, such as a table. Make sure your upper arm is at the level of your heart.
- φ Do not speak while your blood pressure is being measured.
- φ Let your arm be relaxed. Do not make a tight fist.
- φ Each time you measure, take three readings one minute apart and record the results.

Record your blood pressure in a chart which you can bring to your doctor each time. Also write down a list of the medications that you are currently taking. Include the dose and frequency in it. You may also need to have your blood pressure checked regularly by your doctor.

Also, for best results, ensure that you get your blood pressure machine calibrated every year.



Below is an example of how to record the blood pressure readings at home:

<b>Date</b>	<b>Time</b>	<b>Systolic (Upper)</b>	<b>Diastolic (Lower)</b>	<b>Remarks</b>	<b>Next FollowUp</b>
5/9/23	2pm	150	94	Forgot to take medicine, feeling uneasy	1/10/23

There are also blood pressure apps that you can use to log your blood pressure and remarks. These can then be shared with your doctor during your routine visits.

**You can try using apps like: Blood Pressure Stat or Bp Tracker**

## What to Do in an Emergency?

Blood pressure can vary even after starting the medicines for a few days. Close monitoring and follow up with the doctor is required at the onset of treatment. Thereafter, regular timely visits to the doctor are necessary.

### Visit a doctor when:

- φ You think you are having a reaction to medicines you have taken.
- φ You have repeated headaches.
- φ You feel dizzy.
- φ You have swelling in your ankles.
- φ You have trouble with your vision.





### **Immediately visit ER when:**

- φ You develop a severe headache or confusion.
- φ You have unusual weakness or numbness, or you feel faint.
- φ You have severe pain in your chest or abdomen.
- φ You vomit repeatedly.
- φ You have trouble breathing.

**These symptoms may be an emergency. Call 108 or AHCH emergency number 9924343344 and get help right away. Do not wait to see if the symptoms will go away. Do not drive yourself to the hospital.**



## Prevention

Lifestyle changes can help lower high blood pressure and help anyone with hypertension. Many who make these changes will still need to take medicine. But the blood pressure will remain under better control with these measures.

### Do:

- ϕ Eat more vegetables and fruits.
- ϕ Sit less. Be more physically active, which can include walking, running, swimming, dancing or activities that build strength, like lifting weights.
- ϕ Get at least 150 minutes per week of moderate-intensity aerobic activity or 75 minutes per week of vigorous aerobic activity.
- ϕ Do strength building exercises 2 or more days each week.



- φ Lose weight if you're overweight.
- φ Take medicines as prescribed by your doctor.
- φ Keep appointments with your doctor.
- φ Get a full body health check up every year.

### **Don't:**

- φ Eat too much salty food (try to stay under 2 grams per day)
- φ Eat foods high in saturated or trans fats
- φ Smoke or use tobacco
- φ Drink alcohol
- φ Miss medication.

### **Reduce the risks of hypertension by:**

- φ Reducing and managing stress
- φ Regularly checking blood pressure
- φ Treating high blood pressure
- φ Managing other medical conditions.



## FAQs Related to Hypertension

### ϕ Why should I get my blood pressure checked?

- As part of a routine check-up – Your doctor or nurse will record your blood pressure and see if it changes over time.
- To check if you have high blood pressure.
- To check how well your medicines are working (if you take blood pressure medicines).
- In some cases, your doctor might take a few different blood pressure measurements over a short period of time (for example, over 1 week) to see if there are any variations.



### ϕ Does blood pressure change?

- Blood pressure can be quite variable, even in the same person.
- Blood pressure goes up and down with different normal daily activities. For example, exercise, changes in posture and even talking changes blood pressure.

- Blood pressure tends to be higher during the day than at night and higher in the winter than in the summer.
- Blood pressure also rises when we grow older, particularly systolic blood pressure.
- Before adulthood, blood pressure rises in parallel with height.
- In adult years, weight and blood pressure are closely related. When weight goes up, blood pressure tends to go up and we can lower blood pressure by losing weight.

#### φ **How long does high blood pressure last?**

If you have primary high blood pressure, you'll need to manage it for the rest of your life. If you have secondary high blood pressure, your blood pressure will most likely come down after you receive treatment for the medical problem that caused it. If a medication caused your high blood pressure, switching to a different medicine may lower your blood pressure.



φ **What is the best medication to take for hypertension?**

There's not one best medication for the treatment of hypertension for everyone. Each person's conditions like age, comorbidities, general health are taken into consideration before deciding what is best for them.

φ **What could be causing my blood pressure to be quite erratic?**

Variations in blood pressure is referred to as labile blood pressure. For those who develop labile blood pressure, heart problems, hormonal problems, neurological problems, or even psychological conditions may be the cause. Finding and treating the underlying cause of labile blood pressure can significantly improve the condition.

φ **Will hypertension go away without treatment?**

It is rare for hypertension to disappear by itself. The general rule is that blood pressure gets higher with time and the risk of complications goes up also.





## φ **Will blood pressure medication have side effects on my body?**

These days drugs are safe and generally free of major side effects, but no drug is completely free of side effects in all patients.

As blood pressure drugs work by reducing blood pressure, sometimes too great a fall in blood pressure can cause dizziness on standing. This can be a problem in the summer months and especially when rising quickly from squatting. Dizziness on standing also can be worse in older patients.

There are a variety of other symptoms that can result from blood pressure medications and if these appear in the days or weeks after treatment has begun you should consult your doctor. However, do not stop medications yourself without medical advice, as sometimes the blood pressure will rebound to very high levels that can be dangerous.



Please use the space below to write down any further questions to ask the doctor when you come to the hospital for your appointment.

We hope this information will help you clear all your doubts about hypertension.

**Jai Sat Chit Anand**

