

# Atrial Fibrillation and High Blood Pressure

The normal heart rhythm is coordinated and regular. [Atrial fibrillation is an abnormal heart rhythm \(arrhythmia\) that causes a chaotic and irregular heartbeat.](#) High blood pressure is the most common cause of atrial fibrillation (AFib). High blood pressure has a major impact on the development, progression and outcomes of AFib.

High blood pressure can cause atrial fibrillation and if it is not adequately treated, it also becomes a risk factor for atrial fibrillation progression. When atrial fibrillation first develops it usually comes and goes and is called paroxysmal atrial fibrillation. Symptoms of paroxysmal atrial fibrillation can include heart flutters (palpitations), racing heart, chest pain, shortness of breath, fatigue and decreased ability to exercise. Atrial fibrillation tends to progress and can become continuous (persistent AFib) or permanent.

Adequately controlling AFib risk factors, like high hypertension, can help prevent progression. It can also help make atrial fibrillation treatments, like medications and catheter ablation, more effective.

## Can high blood pressure cause arrhythmia?

High blood pressure can cause arrhythmias, like atrial fibrillation and atrial flutter. In fact, data shows that one in six cases of AFib is caused by hypertension. Blood pressure is the comparison of the amount of pressure exerted on arterial walls when the heart contracts/beats (systole) vs when the heart muscle relaxes (diastole). Research has found that the risk of atrial fibrillation increases with either high systolic or diastolic blood pressure.

Hypertension contributes to atrial fibrillation by causing sympathetic nervous system (fight or flight) activation, systemic inflammation, oxidative stress, kidney damage, and structural changes in the heart. Structural changes to the heart muscle which can result from high hypertension include:

- **Left ventricular hypertrophy.** The heart's left lower chamber (ventricle) is the powerhouse of the heart and is responsible to pump blood out of the heart to the rest of the body. When a person has hypertension the left ventricle has to work harder than normal to overcome the high pressure in the arteries. Just like curling heavier dumbbells causes your biceps to get bigger, working against higher pressure causes the heart muscle of the left ventricle to get thicker. This is called left ventricular hypertrophy. Overtime, left ventricular hypertrophy can lead to cardiomyopathy and heart failure.
- **Diastolic dysfunction.** Systole occurs when the heart squeezes (contracts) to pump blood. Diastole is when the heart muscle relaxes so the heart can fill back up with blood. Diastolic dysfunction is when the heart does not relax normally. Hypertension can cause diastolic dysfunction and diastolic heart failure.
- **Atrial stretch and fibrosis.** As the heart is stressed by having to work harder than normal the upper chambers (atria) can begin to enlarge (stretch). Hypertension causes increased systemic inflammation, oxidative stress and sympathetic nervous system activation which can compound the problem of atrial stretch by causing fibrosis (stiffness) in the left atrium. Together atrial stretch and fibrosis create an environment in which atrial fibrillation can be initiated and maintained.

Even though we know that hypertension can cause atrial fibrillation, there has not been evidence that having hypotension is protective against the development of atrial fibrillation or other arrhythmias.

## Does AFib cause high blood pressure?

AFib does not cause hypertension but if you have AFib you may be put on medications to lower your blood pressure. This is not because AFib can cause high blood pressure but rather that previously undiagnosed high blood pressure may have caused AFib.

Hypertension has been called the silent killer because it usually does not have any symptoms until serious complications develop. Complications of high blood pressure can include:

- Stroke
- An arrhythmia like atrial fibrillation or atrial flutter
- Heart failure
- Heart attack
- Intracranial hemorrhage (bleeding in the brain)
- Heart disease related death

Having had a complication from hypertension is usually a sign of long-standing untreated, or inadequately treated high blood pressure. Controlling blood pressure will help minimize the risk of repeated complications.

Sometimes high blood pressure complications can become compounded. For example, high blood pressure can cause AFib. Both AFib and high blood pressure are known to independently increase the risk of stroke. People with high blood pressure are twice as likely to have a stroke compared to people without high blood pressure. People with AFib have 5 times the risk of stroke. Multiple studies have demonstrated that the presence of high blood pressure in patients with atrial fibrillation further increases the risk of stroke.

## How do AFib and high blood pressure increase the risk of stroke?

Blood travels through arteries to supply oxygen and nutrients to the brain. A stroke occurs when an artery to the brain is damaged or blocked which interfere with your heart's electrical signals and limits or stops blood flow and cells start to die.

High blood pressure and atrial fibrillation [significantly increase the risk of stroke](#) but they do so in different ways.

**High blood pressure and stroke.** When a person has hypertension, too much force is exerted on the artery walls each time the heart pumps. Over time this damages arteries, causing blockages or weakness in the arterial wall to develop. A stroke can occur if a weakened artery ruptures or blockages progress so that blood supply to the brain is interrupted or diminished.

**Atrial fibrillation and stroke.** The irregular heart rhythm of atrial fibrillation can cause blood to pool in the heart. When blood pools it can form clots. If blood clots leave the heart they can be carried to the brain where they can block blood flow and cause a stroke.

If you are diagnosed with atrial fibrillation or atrial flutter, your stroke risk will be assessed. This is done by assigning a CHA2DS2 VASc score.

**C** – Congestive heart failure (1 point)

**H** – Hypertension (1 point)

**A2** – Age greater than 75 years (2 points)

**D** – Diabetes mellitus (1 point)

**S2** – History of stroke, transient ischemic attack (i.e. mini-stroke), or thromboembolism (2 points)

**V** – Coronary artery disease, heart attack or peripheral arterial disease (1 point)

**A** – Age between 65 and 74 years (1 point)

**Sc** – Female Sex (1 point)

An elevated CHA2DS2 VASc score (men: >1 point, women: >2 points) means you are at an increased risk of having a stroke and stroke prevention needs to be addressed. The most common method to prevent blood clots in atrial fibrillation is anticoagulation (i.e. blood thinners).

Hypertension is a component of the CHA2DS2 VASc score and increases the risk of atrial fibrillation-related stroke. However, high hypertension is controllable with a healthy lifestyle and medications. Checking your blood pressure regularly is a simple thing you can do to decrease your risk of untreated hypertension and its potential complications.

## How does atrial fibrillation affect blood pressure?

It is more common that blood pressure affects atrial fibrillation than the vice versa. However, there are examples in which atrial fibrillation can cause hypotension. People with atrial fibrillation can develop a weakened heart muscle and heart failure.

When heart failure develops, the body is less able to compensate for atrial fibrillation which can result in hypotension. This is because the chaotic, irregular heartbeat of atrial fibrillation causes the heart to work less effectively. When the heart is in atrial fibrillation and is beating too fast it does not have enough time to fill with blood. This means the weak heart that is not squeezing well will have less blood to pump out to the body which will result in hypotension. Unfortunately, low blood pressure puts even more strain on the weak heart and can make an irregular heartbeat worse.

## Can you have AFib without high blood pressure?

While it is very common for people with atrial fibrillation to have high blood pressure, not everyone with AFib has hypertension. High blood pressure causes AFib because of the way it changes the heart's structure. Other things that can damage the heart structure and can cause AFib include:

- Heart attack
- Heart valve disease
- Heart failure
- Coronary artery disease (blockages in the arteries that feed the heart muscle)
- Sleep apnea
- Thyroid problems, specifically hyperthyroidism
- Lung disease
- Blood clots in the lungs (pulmonary embolism)
- Alcohol
- Problems with the heart's natural pacemaker (sick sinus syndrome)
- Heart defects you are born with (congenital heart disease)

- Viral infection, severe illness, or pneumonia
- Heart surgery
- Stimulants (tobacco and certain street drugs, prescription medications, and OTC cold medications)

Some people who develop AFib do not have any structural heart disease. Certain characteristics and other health conditions that can also increase the risk of developing atrial fibrillation are:

- Advancing age
- Gender
- Family history
- Obesity
- Diabetes
- Chronic kidney disease

## **How to reduce the risk of high blood pressure and atrial fibrillation?**

People with high blood pressure are at an [increased risk of developing atrial fibrillation](#). Luckily, there are a number of healthy lifestyle choices you can make to decrease your risk of developing AFib and other high blood pressure-related health conditions.

- Maintain a healthy weight
- Don't smoke
- Limit alcohol intake to no more than one drink per day for women and two drinks per day for men.
- Limit stress
- Get regular physical activity
- Eat a heart healthy diet that is rich in fruits, vegetables, and whole grains. Limit salt, saturated and trans fats, and cholesterol.
- Take your medications as prescribed.