

Stroke Prevention

How to Limit Your Risk of a First or Recurrent Stroke

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Quick Facts

- Knowing your personal risk factors and the warning signs of a stroke can help prevent a first or recurrent stroke
- Although it's not possible to control all risk factors, there are multiple ways that individuals can modify their lifestyles to decrease the chance of a stroke

Stroke is the fifth leading cause of death and a leading cause of disability in the United States (Albright et al., 2018). Approximately 700,000 US adults have a stroke each year and approximately 1 in 4 stroke survivors have a second, or recurrent, stroke (Albright et al., 2018; American Stroke Association). Individuals are at the highest risk of a recurrent stroke during the first six months post-stroke (Albright et al., 2018). Because of these statistics, it is critical that both stroke survivors and the general population are aware of potential risk factors for stroke.

Stroke Knowledge

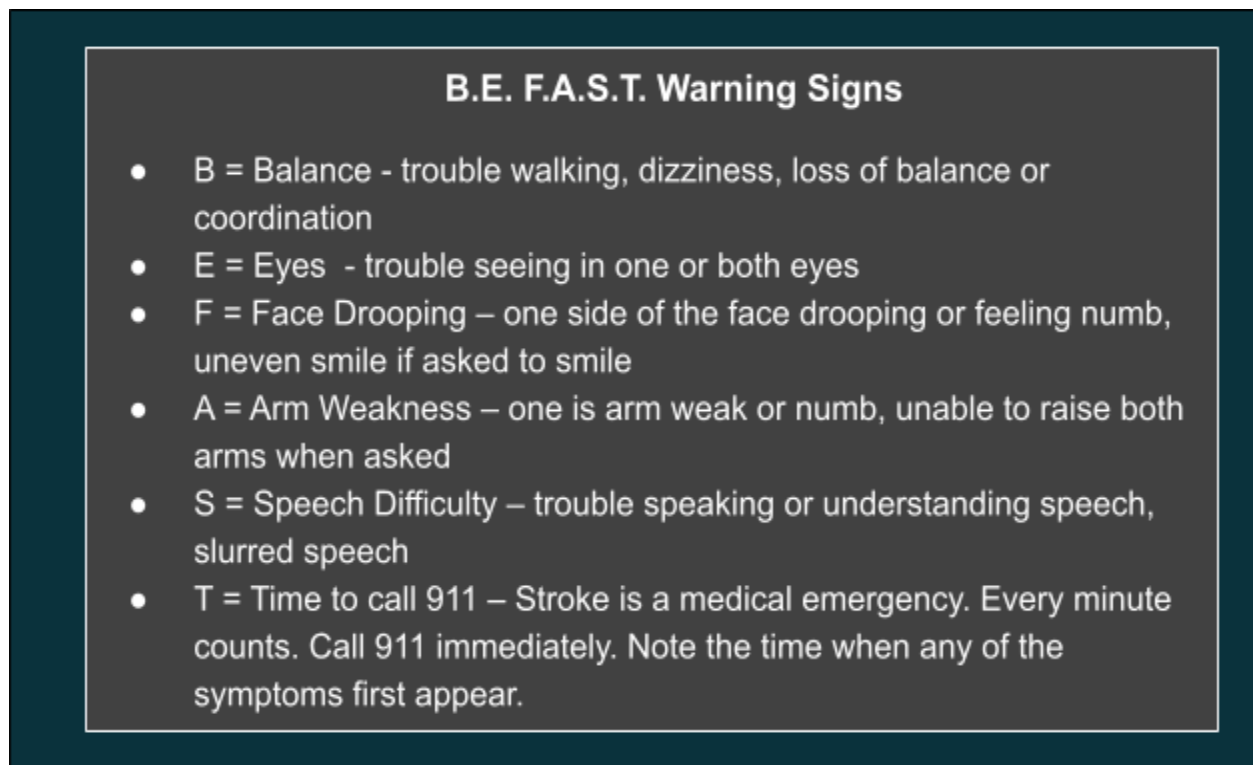
To understand stroke risk factors, it is helpful to first know the different types of stroke that can occur. Strokes can be either **hemorrhagic** or **ischemic**. An **ischemic stroke** is when blood vessels become blocked with plaque which cuts off blood flow to the brain (American Stroke Association). A **hemorrhagic stroke** is when a weakened blood vessel ruptures and bleeds into the surrounding brain tissue (American Stroke Association). The majority (around 80%) of

strokes are ischemic (Boehme et al., 2017). A **transient ischemic attack**, or **TIA**, is sometimes referred to as a ‘mini stroke’ and presents with the same symptoms of a regular stroke but usually only lasts a few minutes. TIAs are often considered “warning” strokes and since about 12% of all strokes occur after a TIA, they should also be treated as a medical emergency (American Stroke Association).

Although risk factors for these two types of strokes are similar, there are some differences. For example, **atrial fibrillation** is a common risk factor for an ischemic stroke. However, **hypertension** (e.g., **high blood pressure**) is an important risk factor for hemorrhagic and ischemic strokes (Boehme et al., 2017). There are also strokes with no clear cause called a **cryptogenic stroke**, and it’s estimated that about 1 in 3 ischemic strokes are cryptogenic (American Stroke Association).

Potential hidden causes of stroke include irregular heartbeat ([atrial fibrillation](#)), heart structure problems (e.g., [patent foramen ovale](#)), hardening of the arteries (aka [large artery atherosclerosis](#)), or a blood clotting disorder ([thrombophilia](#)) (American Stroke Association). Regardless of whether or not you know the specific cause of your stroke, it is important to follow your doctors’ instructions and ask questions regarding best ways to prevent a recurrent stroke.

Beyond being familiar with the types of stroke that exist, it is crucial to know the warning signs of a stroke.

A graphic with a dark teal background and a white border. Inside, on a dark grey background, is the title "B.E. F.A.S.T. Warning Signs" in white bold text. Below the title is a bulleted list of six items, each starting with a white dot. The text is white and easy to read against the dark background.

B.E. F.A.S.T. Warning Signs

- B = Balance - trouble walking, dizziness, loss of balance or coordination
- E = Eyes - trouble seeing in one or both eyes
- F = Face Drooping – one side of the face drooping or feeling numb, uneven smile if asked to smile
- A = Arm Weakness – one is arm weak or numb, unable to raise both arms when asked
- S = Speech Difficulty – trouble speaking or understanding speech, slurred speech
- T = Time to call 911 – Stroke is a medical emergency. Every minute counts. Call 911 immediately. Note the time when any of the symptoms first appear.

Other stroke symptoms may include:

- Numbness or weakness of face, arm, or leg, especially on one side of the body
- Severe headache with no known cause

The “T,” or Time element, of the above acronym is most crucial, as the more immediate the treatment, the better chance there is of reducing long-term effects or even preventing death. Treatment approaches will vary depending on the type of stroke. For example, there is a clot-busting drug used to treat ischemic strokes that must be provided within 3 to 4.5 hours of onset of stroke symptoms. The sooner this drug can be provided, the better (American Stroke Association).

Risk Factors for Stroke

Stroke risk factors can either be modifiable or non-modifiable. Modifiable risk factors are things that we can change such as managing a chronic condition or making lifestyle changes, whereas non-modifiable are things that we cannot change such as our age, sex, or race.

Modifiable Stroke Risk Factors	Non-modifiable Stroke Risk Factors
Hypertension (e.g., high blood pressure)	Age
Hyperlipidemia (e.g., high cholesterol)	Sex
Smoking or vaping	Race/ethnicity
Alcohol use	Personal history of stroke
Diet, body weight	Genetics: family history of stroke
Physical activity or exercise	
Management of other health conditions such as: diabetes, atrial fibrillation, sleep apnea, cardiovascular disease (coronary heart disease, peripheral vascular disease, and congestive heart failure), psychosocial stress and depression	

Non-Modifiable Stroke Risk Factors

Age

As we get older, the incidence of stroke increases. The incidence of stroke among younger individuals may be due to a variety of factors, including but not limited to, an increase in diabetes mellitus among the population, as well as diagnostic testing becoming more sensitive to minor symptoms of stroke (Boehme et al., 2017).

Sex

Overall, strokes are more common among women than men due to women's longer life spans. However, at younger ages women have comparable or higher risk of stroke than men potentially due to risks related to pregnancy and postpartum, as well as other hormonal factors (Boehme et al., 2017).

Race

Black Americans experience the highest death rate due to stroke compared to other racial/ethnic groups (CDC, 2024), and are approximately 60% more likely than White Americans to experience a recurrent stroke within 2 years due to having greater baseline risk factors, including hypertension, diabetes mellitus, smoking, and high BMI (Park & Ovbiagele, 2016). Young Black adults are particularly at a greater risk than age-matched White adults for hemorrhagic stroke (Boehme et al., 2017). Some studies have also shown that Hispanic/Latino Americans and Native Americans have an increased risk of stroke compared to non-Hispanic whites, but more research is needed (Boehme et al., 2017).

These racial disparities may be due to a variety of factors including limitations in access to preventative care, including smoking cessation interventions and provision of crucial discharge drugs, such as anticoagulants and antithrombotic drugs (Kernan et al., 2014), as well as factors such as socioeconomic status, education level, insurance coverage, and access to transportation (Levine et al., 2010). These disparities highlight the importance of additional research and stroke prevention interventions targeting minority groups.

Genetics

Genetic factors contribute to stroke risk, but assessing specific individual risk is still very challenging (Boehme et al., 2017). Genetic factors are considered non-modifiable at this time, however there may be environmental factors that predispose some individuals to conditions such as diabetes mellitus or hypertension, which can be addressed through lifestyle modifications (Boehme et al., 2017).

Modifiable Stroke Risk Factors

Regardless of one's stroke risk, we can all benefit from adopting healthy lifestyles that include a healthy diet, regular exercise, and avoidance of tobacco. If you are at risk of a stroke, or have already had a stroke, it is crucial to identify any risks and to modify your lifestyle, as appropriate, and as early as possible. By doing so, you can increase your chance of staving off a variety of conditions including stroke, coronary artery disease, heart failure, diabetes mellitus, and dementia (Boehme et al., 2017). Below are more details about how to limit your risks through lifestyle modifications.

NOTE: Please be sure to consult a healthcare provider before engaging in any significant changes to your lifestyle

Diet and Exercise

Diet influences both the risk of stroke and of other stroke risk factors including diabetes mellitus, hypertension, and dyslipidemia (abnormal levels of lipids, such as triglycerides or cholesterol, in the blood (Boehme et al., 2017)). A **Mediterranean diet** has been shown to reduce the risk of stroke (Boehme et al., 2017). This diet emphasizes consumption of vegetables, fruits, whole grains, low-fat dairy products, fish, legumes and nuts, and recommends limiting consumption of saturated fat, trans fat, sodium, sweetened drinks, red and processed meats, and excess calories. In general, obesity is related to hypertension and diabetes mellitus, which are stroke risk factors (Boehme et al., 2017). However, the specific connections between body weight, obesity and stroke risk are still being uncovered.

Physical inactivity is associated with stroke (Boehme et al., 2017). Those who exercise have a lower risk of stroke and stroke mortality compared to those who do not, which may be due to decreases in blood pressure, reduction in diabetes mellitus, and reduction in excess body weight (Boehme et al., 2017). Adults are recommended to get 2.5 hours of moderate or 75 minutes of vigorous physical activity per week (American Heart Association, 2024).

Takeaway

- Adopt a balanced diet full of vegetables, fruits, whole grains, low-fat dairy products, fish, legumes and nuts. When possible limit saturated fats, trans fat, sodium, sweets, red meats, and excess calories.
- Get physically active! This can look like a variety of different activities depending on your personal preferences.

Alcohol Use, Substance Use and Smoking

The connection between alcohol use and stroke risk depends on the stroke type. In general, excessive drinking - defined as more than one drink per day for women and more than two drinks per day for men - is associated with an increased risk of ischemic stroke (American Stroke Association). However, any amount of alcohol consumption has been linked to an increase in hemorrhagic stroke (Boehme et al., 2017). Abuse of substances such as cocaine, heroin, amphetamines, and ecstasy is associated with an increased risk of both ischemic and hemorrhagic strokes (Boehme et al., 2017). Use of nicotine, whether through traditional cigarettes, e-cigarettes or vaping, can cause damage to the blood vessels and is a major risk factor for stroke, with cessation of smoking reducing this risk (Boehme et al., 2017).

Takeaway

- Limit use of alcohol, substances and tobacco as much as possible. Talk to your healthcare provider for additional support.

High Blood Pressure

The higher one's blood pressure, the higher their risk of stroke (Boehme et al., 2017), with normal blood pressure being below 120/80. High blood pressure is a leading risk factor for an ischemic stroke (American Stroke Association). Blood pressure also increases with age, and thus increases the lifetime risk of developing high blood pressure, or hypertension. It is important to understand your blood pressure readings and have it assessed regularly. Medication and lifestyle changes, such as changes in diet and increasing physical activity, can reduce the impact of hypertension and thus reduce stroke risk (Boehme et al., 2017)

BLOOD PRESSURE CATEGORY	SYSTOLIC MM HG (UPPER #)		DIASTOLIC MM HG (LOWER #)
Normal	Lower than 120	<i>and</i>	Lower than 80
Elevated Blood Pressure	120 –129	<i>and</i>	80
High Blood Pressure (Hypertension) Stage 1	130 –139	<i>or</i>	80 –89
High Blood Pressure (Hypertension) Stage 2	140 or higher	<i>or</i>	90 or higher
Hypertensive Crisis (Consult your doctor immediately)	Higher than 180	<i>and/or</i>	Higher than 120

[Table Source](#)

Takeaway

- Talk to your doctor about your blood pressure and consider both medication and lifestyle changes as appropriate.

High Cholesterol

Cholesterol is a fat-like substance that comes from food as well as your body. High cholesterol, also often referred to as hyperlipidemia or dyslipidemia, is when you have too many fats in your blood. Having too much cholesterol, particularly low-density lipoprotein (LDL), is bad for you because it can block the arteries that help deliver blood throughout your body. This blockage can lead to a stroke or heart attack, among other complications (Cleveland Clinic, 2022).

The relationship between high cholesterol and stroke risk is complex with some conflicting evidence, and may depend on stroke type. Despite this, research has generally found that statins reduce the risk of ischemic stroke without increase in the risk of hemorrhagic stroke (Boehme et al., 2017). Overall, you can help manage your cholesterol by adopting healthy lifestyle behaviors that include a healthy diet, regular exercise, avoiding tobacco, replacing saturated fats with unsaturated fats, and taking your medications as directed (American Heart Association, 2024).

Takeaway

- Talk to your doctor about your cholesterol and consider both medication and lifestyle changes as appropriate

Management of Chronic Health Conditions

Understanding and managing any chronic health conditions you may have is another important way you can reduce your stroke risk. Below is a list of common chronic conditions that are associated with stroke risk.

Diabetes mellitus

Diabetes is a condition that causes blood sugar, or glucose, to rise. Excessive blood glucose can damage the body's blood vessels, which can lead to a narrowing or blockage of these blood vessels leading to a stroke (American Stroke Association). Diabetic individuals are two times as likely to have a stroke compared to individuals without diabetes (Boehme et al., 2017).

Individuals with prediabetes are also at an increased risk of stroke, as well as heart disease.

Applying a combination of lifestyle changes (e.g., adopting a heart-healthy diet, maintaining a healthy weight, exercising, avoiding cigarette smoking, limiting alcohol use, and managing stress) and medical management for diabetes has demonstrated a reduced risk of stroke (Boehme et al., 2017).

Atrial fibrillation

Atrial fibrillation, also known as **AFib**, is an irregular heartbeat, or arrhythmia. In a healthy individual, the heart contracts and relaxes to a regular beat. In contrast, with AFib, the upper chambers of the heart beat irregularly. When enough blood is not pumped out of these chambers, the pooled blood can lead to a clot, which can therefore lead to stroke, heart attack, or other heart-related issues (American Stroke Association). Atrial fibrillation is a major risk factor for stroke with Afib patients being 5 times more likely to have a stroke compared to those without Afib (Boehme et al., 2017; stroke site). Approximately 15% to 20% of people who have strokes have Afib. It is important to know the symptoms of Afib in order to get treatment as soon as possible to prevent any further complications.

Atrial fibrillation signs & symptoms ([Content source](#))

Note: some people with Afib may have no symptoms

- General fatigue
- A rapid and irregular heartbeat
- Fluttering or “thumping” in the chest
- Dizziness
- Shortness of breath and anxiety
- Weakness

- Faintness or confusion
- Fatigue when exercising
- Sweating
- [Chest pain](#) or pressure (This may be indicative of a heart attack and is a **medical emergency**. **Call 911 immediately** if you are experiencing these symptoms, even if they are temporary or seem to disappear)

Because having AFib can put you at an increased risk for heart attack, it is important to also know the signs and symptoms of a **heart attack** ([Content source](#))

- Chest discomfort: discomfort in the center of the chest that lasts more than a few minutes, or that goes away and comes back; can feel like uncomfortable pressure, squeezing, fullness or pain
- Discomfort in other areas of the upper body, such as pain or discomfort in one or both arms, the back, neck, jaw or stomach.
- Shortness of breath with or without chest discomfort.
- Breaking out in a cold sweat, nausea or lightheadedness.

Reduce your risk of Afib by maintaining a heart-healthy lifestyle which includes regular physical activity, eating a heart-healthy diet low in salt, maintaining a healthy weight, managing high blood pressure and cholesterol levels, avoiding tobacco, and avoiding excessive alcohol use (American Stroke Association). If you have already been diagnosed with AFib, be sure to follow your doctor's instructions regarding medication use and other ways to manage your condition.

Sleep apnea

Sleep apnea is a type of breathing disorder characterized by partial or complete cessation of breathing multiple times throughout the night. This can cause low oxygen levels during sleep and elevated blood pressure, both of which can increase the risk of a first-time or recurrent stroke. Although this condition can impact anyone, it can especially impact individuals who are male, overweight and over the age of 40. Sleep apnea is also a common condition *after* a stroke.

Sleep apnea signs & symptoms ([Content Source](#))

- Snoring (usually observed or reported by sleep partner)
- Disrupted sleep or waking up frequently during the night, gasping for air
- Daytime fatigue and feeling tired
- Morning headache
- Problems with concentration and memory

Heart disease

Coronary heart disease is when there is plaque buildup in the heart's arteries which can lead to a heart attack or an ischemic stroke (American Stroke Association). Coronary heart disease and **coronary artery disease** are often used interchangeably, but coronary heart disease can actually result in coronary artery disease. Common risk factors for coronary heart disease are high LDL cholesterol, low HDL cholesterol, high blood pressure, family history, diabetes, smoking and obesity (American Stroke Association). Reduce your risk of coronary artery disease through regular physical activity, eating a heart-healthy diet, and maintaining a healthy weight.

Heart failure is when the heart isn't pumping as well as it should be. **Congestive heart failure** is a type of heart failure. Individuals with heart failure are at a higher risk of stroke than those without (American Stroke Association). Although there is usually no cure, there are ways to manage the condition through medications and a healthy lifestyle.

Other conditions that may impact stroke risk

- **Carotid artery disease** (or carotid artery stenosis): when plaques clog blood vessels, which can impact blood flow and increase one's risk for stroke (American Stroke Association). Because there are typically no symptoms, be sure to schedule regular check-ups with your healthcare provider to assess your arteries (American Stroke Association)
- **Peripheral artery disease (PAD)**: when plaques clog blood vessels to the legs and arms; individuals with PAD have a higher risk of carotid artery disease, which increases the risk of stroke (American Stroke Association). The strongest risk factors for PAD are diabetes and smoking.
- Blood disorders, such as **sickle cell anemia**: genetic disorder which results in "sickled" red blood cells which are less able to carry oxygen throughout the body (American Stroke Association). The cells tend to stick to blood vessel walls which can block blood flow to the brain and cause a stroke. If you have sickle cell disease, reduce your risk of stroke by working with your healthcare providers to prevent and manage flare-ups.

Takeaway

- Talk to your doctor about obtaining proper diagnoses if you have or think you may have any of the above listed conditions. Having a proper diagnosis will allow for optimal management of these health conditions.

Resources

- [Stroke Risk Assessment](#)

- An assessment to better understand your specific stroke risk factors. If you score in the “higher risk” column, ask your health care professional about how you can reduce your risk
- [Secondary Stroke Prevention Checklist](#)
- *My Life Check* is an online tool to assess your heart health and better understand your risk for heart disease and stroke: <https://mlc.heart.org/>
- Get support to quit tobacco: 1-800-QuitNow
- [I-Rebound](#)
 - Australian website with multiple resources made in partnership with stroke survivors. Includes healthy recipes, exercise videos and hints and hacks

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