High blood pressure is a serious health problem. High blood pressure increases your risk of heart attacks, strokes, and kidney failure. Because high blood pressure can progress silently and without symptoms many people do not know they have high blood pressure until they have a heart attack or stroke. If high blood pressure is not detected and controlled, it can do damage to the heart, brain, and kidneys. Fortunately, with detection and proper treatment high blood pressure can be controlled.

**What is Blood Pressure**

Blood pressure is the pressure on the blood vessel walls. A blood pressure reading consists of two numbers, for example 120/80 or 120 over 80. The first number is called systolic pressure. The systolic pressure is the pressure on the blood vessels when your heart contracts, or pumps blood out. The second number is called diastolic pressure. The diastolic pressure is the pressure on the blood vessels when your heart is resting between contractions. Recommended blood pressure is less than 120 over less than 80 (≤120/≤80). Borderline-high blood pressure is 129-139 over 80-89 (120-139/80-89). High blood pressure is greater than or equal to 140 over greater than or equal to 90 (≥140/≥90). You need to keep track of your blood pressure and have it checked regularly. Your blood pressure changes throughout the day. In addition, just going to the doctor may make your blood pressure rise. To properly diagnose high blood pressure, you need two high blood pressure readings, taken several weeks apart. If either your systolic or diastolic blood pressure or both are consistently above 140/90, you may have high blood pressure.

High blood pressure means you have higher than normal pressure on the blood vessel walls. High blood pressure can occur when there is an increase in blood volume, when blood vessels are narrowed by atherosclerosis, or when blood vessels become rigid and do not expand with an increase in blood volume. High blood pressure causes the heart to work harder, and over time may damage the blood vessels. Damage to blood vessels in the heart may cause a heart attack; damage to blood vessels in the brain may cause a stroke. High blood pressure is not the same as stress, although stress may raise blood pressure temporarily. If you have high blood pressure it usually can be controlled with a combination of diet, lifestyle changes, and medication.

**Risk Factors for High Blood Pressure**

High blood pressure is a very complex condition. For most cases of high blood pressure, the exact cause is unknown. Only a small number of high blood pressure cases can be related to a known cause, such as kidney disease. However, there are factors that may affect your high blood pressure. Some of these factors include a family history of high blood pressure, being overweight, increasing age, physical inactivity, smoking, diabetes, high sodium intake (for sodium sensitive individuals), high alcohol intake, and a high fat diet.

- **Family history.** High blood pressure tends to run in families. People may inherit a tendency for high blood pressure. People in the same family may also have similar lifestyle and dietary habits that increase their risk of developing high blood pressure.
• **Overweight.** Being overweight increases your risk of high blood pressure. Where your body stores excess weight also makes a difference. People who carry excess weight around their abdomen have a greater risk of high blood pressure than those who carry excess weight in their hips and thighs. For some people bringing their weight down may be all they need to do to keep their blood pressure in control.

• **Age.** Blood pressure tends to increase with age. Men typically begin having an increase in blood pressure by age 45 to 50. Women usually do not start having an increase in blood pressure until after menopause. The age at which menopause occurs varies, but the average age of onset is 50 years. However, just because you get older does not mean you will develop high blood pressure.

• **Physical activity.** Participation in regular physical activities can lower your resting blood pressure. Regular physical activity can help you lose weight and thus lower the risk of high blood pressure and diabetes. In addition, regular physical activity can lower total blood cholesterol, LDL-cholesterol, and triglycerides, and increase HDL-cholesterol, all of which can lower the risk of atherosclerosis. As a result, regular physical activity may lower your risk of many diseases including high blood pressure, obesity, heart disease, and diabetes.

• **Smoking.** Smoking increases your risk of high blood pressure. Smoking seems to raise blood pressure levels and heart rate. Smoking also lowers HDL-cholesterol. Smoking may increase the tendency of blood to clot and thus lead to a heart attack. In addition, smoking is a key factor in sudden death from cardiovascular disease.

• **Diabetes.** High blood pressure is two to three times more common in people with diabetes, especially uncontrolled diabetes. Insulin resistance, most commonly associated with obesity, signals the pancreas to produce more insulin. High blood insulin signals the kidneys to retain sodium and thus may increase the risk of developing high blood pressure. Lowering your risk of developing high blood pressure is another reason to keep diabetes in control.

• **Sodium intake.** Your kidneys regulate the sodium level in your body. Most people are not affected by excess dietary sodium because their bodies just get rid of excess sodium in the urine. However, some people are sodium-sensitive. For sodium-sensitive individuals, too much sodium in the diet can increase blood pressure. For someone who is sodium-sensitive, lowering sodium intake may help lower blood pressure. Unfortunately, there is no way to know who may be a sodium-sensitive individual. As a result, healthy normal adults are advised to follow the Dietary Guidelines for Americans, which recommends to consume less than 2,300 mg sodium (approximately 1 teaspoon of salt) per day. This advice of moderation is given to all healthy people because there is no way to know if someone is sodium-sensitive. In addition, people do not need extra sodium. There is no advantage to consuming excess sodium, even after physical activities. Although you lose sodium and some other minerals in perspiration, the amount lost is quite small. Regular meals and snacks eaten after physical activity will normally replace minerals lost in perspiration.

The Dietary Reference Intake (DRI) for sodium; is 1,500 mg/day for people 19-50 years of age; 1,300 mg/day for people 51-70 years of age; and 1,200 mg/day for people more than 70 years old. The Upper Level for sodium intake for adults is 2,300 mg/day. On average, most adults consume significantly more, 4,000 to 6,000 milligrams of sodium daily.

Processed foods have the most sodium, while unprocessed foods have the least. As much as 75% of the sodium in your diet comes from salt added to foods by manufacturers. About 15% comes from salt added during cooking and at the table, and only 10% comes from the natural content in foods.

• **Alcohol intake.** Heavy drinking may increase the risk for high blood pressure. Health experts advise not more than one alcoholic drink a day for women, and not more than two a day for men. Alcohol also contributes extra calories, which may increase body weight.

• **High fat and saturated fat intake.** A high fat, high saturated fat intake has been linked to high blood cholesterol, LDL-cholesterol, and triglycerides. High blood cholesterol, especially high LDL-cholesterol, and high triglycerides contribute to both atherosclerosis and high blood pressure. Atherosclerosis narrows the blood vessels and thus decreases blood flow to the kidneys. The kidneys try to increase blood pressure by expanding blood volume and constricting smaller blood vessels. However, the pressure increases not only in the kidneys, but also all over the body. The resulting increase in blood pressure can further damage blood vessel walls and intensify atherosclerosis.

A diet low in both total fat and saturated fat helps lower blood cholesterol and triglycerides, which may decrease your risk of developing atherosclerosis. Reducing fat intake can also help with weight loss, which may lower blood pressure. The 2005 Dietary Guidelines for American recommendations for fat intake are:

- Consume less than 10 percent of calories from saturated fatty acids and less than 300 mg/day of cholesterol, and keep trans fatty acid consumption as low as possible.
- Keep total fat intake between 20 to 35 percent of calories, with most fats coming from sources of polyunsaturated and monounsaturated fatty acids, such as fish, nuts, and vegetable oils.

• **Intake of other nutrients.** Too little of some other nutrients including potassium, calcium, and magnesium, may have an important link to high blood pressure. Adequate intakes of these minerals may actually have a protective effect against high blood pressure. Potassium is found in a wide variety of foods, but especially fruits and vegetables. Milk is a good source of all three nutrients, calcium, magnesium, and potassium. The best recommendation at this time is to consume the recommended amounts of food from the MyPyramid food groups. Recommended amounts from each MyPyramid food group each day for a reference 2,000 calorie diet are:

- 6 oz. of grains
- 2.5 cups of vegetables
- 2 cups of fruit
- 3 cups of milk
- 5.5 oz. of meat and beans
- 6 teaspoons of oil
• **Emotional stress.** For some people, stress may be a factor for high blood pressure. Although the evidence is not clear, learn how to relieve stress for the overall quality of your life.

**Lowering Your Risk of High Blood Pressure**

You can take some preventive measures to lower your risk of developing high blood pressure. Some things you can do to lower your risk are to maintain a healthy weight, be physically active, and if you are a smoker, quit. Some other recommendations are to use sodium and alcohol in moderation and to follow the number of servings recommended by the USDA MyPyramid to make sure you get enough calcium, potassium, and magnesium.

**References**


The Cooperative Extension Service is the largest, most successful informal educational organization in the world. It is a nationwide system funded and guided by a partnership of federal, state, and local governments that delivers information to help people help themselves through the land-grant university system.

Extension carries out programs in the broad categories of agriculture, natural resources and environment; family and consumer sciences; 4-H and other youth; and community resource development. Extension staff members live and work among the people they serve to help stimulate and educate Americans to plan ahead and cope with their problems.

Some characteristics of the Cooperative Extension system are:

- The federal, state, and local governments cooperatively share in its financial support and program direction.
- It is administered by the land-grant university as designated by the state legislature through an Extension director.
- Extension programs are nonpolitical, objective, and research-based information.
- It provides practical, problem-oriented education for people of all ages. It is designated to take the knowledge of the university to those persons who do not or cannot participate in the formal classroom instruction of the university.
- It utilizes research from university, government, and other sources to help people make their own decisions.
- More than a million volunteers help multiply the impact of the Extension professional staff.
- It dispenses no funds to the public.
- It is not a regulatory agency, but it does inform people of regulations and of their options in meeting them.
- Local programs are developed and carried out in full recognition of national problems and goals.
- The Extension staff educates people through personal contacts, meetings, demonstrations, and the mass media.
- Extension has the built-in flexibility to adjust its programs and subject matter to meet new needs. Activities shift from year to year as citizen groups and Extension workers close to the problems advise changes.