



Ministry of Higher Education and Scientific Research

Future university

College of Science

Department of Medical Physics

the first lecturer

Blood pressure measurement experiment

Stage Four - Practical Side

Medical Physics Laboratory

For morning and evening study

BY

M.Maryam Latif Shandel

Blood pressure :

or blood pressure does not start now about the force exerted on the walls, when blood is pumped to the entire body, when the heart muscle contracts, blood is pumped through the aorta (which is the largest artery in the human body responsible for distributing blood to oxygen to everyone) throughout the body).

The blood presses on the vinyl to exit completely when it passes, and there is no blood pressure in this case, the systolic blood tank ((in English: systolic blood pressure) is the highest number when measuring pressure, and after exceeding the pumping of blood, the heart muscle relaxes, and the heart valves close on one side that does not block the aorta to prevent blood from returning to the heart, and the blood pressure in this case is called the diastolic blood structure (in English: diastolic blood pressure), which is the number when measuring pressure.

High blood pressure:

also called hypertension, is a common condition that affects the arteries in the body. When you have high blood pressure, the force of blood pushing against your artery walls is constantly too high. This makes your heart work harder to pump blood.

Blood pressure is measured in millimeters of mercury (mm Hg). High blood pressure is generally considered to be a reading of 130/80 mm Hg or higher.

The American College of Cardiology and the American Heart Association divide blood pressure into four general categories. Ideal blood pressure is considered normal blood pressure.

- **Normal blood pressure.** If your blood pressure reading is less than 120/80 mm Hg.

- **Mild hypertension.** The top number is between 120 and 129 mm Hg and the bottom number is less than 80 mm Hg, but not higher.
- **Stage 1 hypertension.** The top number is between 130 and 139 mm Hg or the bottom number is between 80 and 89 mm Hg.
- **Stage 2 hypertension.** The top number is 140 mm Hg or higher or the bottom number is 90 mm Hg or higher.

Blood pressure higher than 120/180 mm Hg is called a hypertensive emergency. Anyone with a blood pressure reading this high should seek emergency medical care.

If left untreated, high blood pressure increases your risk of heart attack, stroke and other serious health problems. It's important to have your blood pressure checked at least every two years starting at age 18. Some people may need to have their blood pressure checked more often.

Following healthy lifestyle habits, such as not smoking, exercising and eating a healthy diet, can help prevent and treat high blood pressure. But some people need to use medications to treat high blood pressure.

high blood pressure:

High blood pressure occurs when the pressure in your blood vessels is too high (140/90 mm Hg or higher). It's common but can be dangerous if left untreated.

People with high blood pressure may not have any symptoms. A blood pressure test is the only way to know if you have high blood pressure.

Factors that increase your risk of high blood pressure include:

Getting older

Genetics

Being overweight or obese

Not being physically active

A diet high in salt

Excessive alcohol use

Lifestyle changes, such as eating a healthy diet, quitting tobacco and being more physically active, can help lower your blood pressure. However, some people may still need to take medication.

Blood pressure is measured using two numbers. The first number (systolic) represents the pressure inside your blood vessels when your heart contracts or

beats. The second number (diastolic) represents the pressure inside your blood vessels when your heart rests between beats.

High blood pressure is diagnosed if the systolic blood pressure on both days is equal to or greater than 140 mm Hg and/or the diastolic blood pressure on both days is equal to or greater than 90 mm Hg.

Risk factors:

Modifiable risk factors include unhealthy diets (excessive salt intake, a diet high in saturated fats and trans fats, and low intake of fruits and vegetables), inactivity, tobacco and alcohol consumption, and being overweight or obese. In addition, there are environmental risk factors that increase the likelihood of developing high blood pressure and its related diseases, the most prominent of which is environmental pollution.

Immutable risk factors include a family history of high blood pressure, being over 65 years of age, and having other diseases such as diabetes or kidney disease.

Treatment

Lifestyle changes can help lower high blood pressure. These include:

- Eating a healthy, low-salt diet
- Losing weight
- Being physically active
- Quitting tobacco use.

If you have high blood pressure, your doctor may recommend one or more medications. Whether you achieve your doctor's recommended blood pressure goal may depend on other health conditions you have.

A blood pressure goal of less than 130/80 mm Hg is recommended if you have:

- **Cardiovascular disease (heart disease or stroke)**
- **Diabetes (high blood sugar)**
- **Chronic kidney disease**
- **High risk of cardiovascular disease**

For most people, the goal is a blood pressure of less than 140/90 mm Hg.

There are several common blood pressure medications:

- **Angiotensin-converting enzyme (ACE) inhibitors:** These relax blood vessels and prevent kidney damage. Examples include enalapril and lisinopril.
- **Angiotensin II receptor blockers:** relax blood vessels and prevent kidney damage. Examples include losartan and telmisartan.
- **Calcium channel blockers:** relax blood vessels. Examples include amlodipine and felodipine.
- **Diuretics:** help get rid of excess water in the body and lower blood pressure. Examples include hydrochlorothiazide and chlorthalidone.

Preventing the disease Lifestyle changes can help lower high blood pressure, and can help anyone with high blood pressure. However, many people who make these lifestyle changes will still need to take medication.

These lifestyle changes can help prevent and lower high blood pressure.

Do the following:

Eat more fruits and vegetables.

Be less sedentary.

Be more physically active, which can include walking, jogging, swimming, dancing, or activities that strengthen muscles, such as weightlifting.

Do at least 150 minutes of moderate-intensity aerobic exercise or 75 minutes of vigorous-intensity aerobic exercise each week.

Do muscle-strengthening exercises on two or more days each week.

Lose weight if you are overweight or obese.

Take your medications as directed by your health care professional.

Keep your appointments with your health care professional.

Don't:

Eat too much salt (try to eat less than 5 grams a day).

Eat foods high in saturated or trans fats.

Smoke or use tobacco.

- **Excessive alcohol consumption (maximum one drink per day for women and two drinks per day for men).**
- **Missing medication or sharing medication with others.**

Reducing high blood pressure can help prevent heart attacks, strokes, kidney damage, and other health problems.

Reduce your risk of high blood pressure by:

Reducing and managing stress.

Checking your blood pressure regularly.

Treating high blood pressure.

Managing other health conditions.

Reducing exposure to polluted air.

Complications of uncontrolled high blood pressure

One of the complications of high blood pressure is that it can cause serious damage to the heart, as excessive pressure can lead to hardening of the arteries, which reduces the flow of blood and oxygen to the heart. High blood pressure and reduced blood flow can cause the following:

- Chest pain, also known as angina;**
- Heart attack, which occurs when the heart's blood supply is cut off and heart muscle cells die due to lack of oxygen. The longer the blood flow is cut off, the greater the damage to the heart;**
- Heart failure, which occurs when the heart is unable to pump enough blood and oxygen to other vital organs;**
- Irregular heartbeat, which can lead to sudden death.**

High blood pressure can also cause the arteries that supply blood and oxygen to the brain to burst or become blocked, causing a stroke.

In addition, high blood pressure can damage the kidneys, leading to kidney failure.

High blood pressure in low- and middle-income countries

Prevalence of high blood pressure varies across regions and country income groups. The highest prevalence of high blood pressure is found in the WHO African Region (27%), while the lowest is found in the WHO Region of the Americas (18%).

A review of current trends shows that the number of adults with high blood pressure has increased from 594 million in 1975 to 1.13 billion in 2015, with the increase largely observed in low- and middle-income countries. This increase is mainly due to increased risk factors for high blood pressure in these population groups.

Complications of uncontrolled high blood pressure

One of the complications of high blood pressure is that it can cause serious damage to the heart, as excessive pressure can lead to hardening of the arteries, which reduces the flow of blood and oxygen to the heart. High blood pressure and reduced blood flow can cause the following:

- Chest pain, also known as angina;
- Heart attack, which occurs when the heart's blood supply is cut off and heart muscle cells die due to lack of oxygen. The longer the blood flow is cut off, the greater the damage to the heart;
- Heart failure, which occurs when the heart is unable to pump enough blood and oxygen to other vital organs;
- Irregular heartbeat, which can lead to sudden death.

High blood pressure can also cause the arteries that supply blood and oxygen to the brain to burst or become blocked, causing a stroke.

In addition, high blood pressure can damage the kidneys, leading to kidney failure.

High blood pressure in low- and middle-income countries

Prevalence of high blood pressure varies across regions and country income groups. The highest prevalence of high blood pressure is found in the WHO African Region (27%), while the lowest is found in the WHO Region of the Americas (18%).

A review of current trends shows that the number of adults with high blood pressure has increased from 594 million in 1975 to 1.13 billion in 2015, with the increase largely observed in low- and middle-income countries. This increase is mainly due to increased risk factors for high blood pressure in these population groups.

