# ARTERIAL HYPERTENSION

In order to understand Hypertension someone has to understand, firstly, the meaning of Blood Pressure and the problems that it can cause. Arterial Blood Pressure (or Blood Pressure) is defined as the pressure that blood exerts on the arterial walls as it circulates within them, and depends both on the amount of blood that is pushed from the heart with each contraction and on the resistance that is forced by the vessel itself.

When measuring and recording blood pressure with a classic blood pressure monitor and stethoscope, attention should be paid to two sounds: the first Korotkoff sound corresponds to the contraction of the heart and the pushing of blood in the arteries (systolic or high pressure) and the last Korotkoff sound (frankly the time that the sound stops) which corresponds to the pressure forced in the artery walls during heart dilation (diastolic or low pressure). Blood Pressure reported in units (e.g. 12 to 8) is not correct. It should be reported in millimeters of mercury (e.g. 120mmHg with 80mmHg).

Blood Pressure should be measured when the person is calm and seated with the left hand usually leaning to stable area (table, chair) and in a straight line with the heart. The monitor's cuff should be at least one third of the upper arm (brachium) and able to make a full turn around the upper arm. If the cuff is too narrow or too small, it will not be able to inflate properly and Blood Pressure recording will be incorrect.

Blood Pressure measurement is performed with the sleeve of the blouse/shirt up in a way that it is not so tight. It is best to take off the blouse/shirt in order to have a more accurate measurement. Finally, it should be ensured that the two rubber tubes connecting the cuff with the blood pressure monitor are placed in

the inner surface of the elbow where the brachial artery passes and where the stethoscope should be placed.

When measuring, and after making sure that the valve of the blood pressure monitor is closed, the cuff is inflated approximately 30mmHg above the level that the pulse has stopped being heard. Then, by turning the valve slowly the other way, the air is deflated and mercury (in mercury monitors) or the needle of the manometer (in mechanical monitors) is lowered. The point where the first sound is heard corresponds to the Systolic Blood Pressure and the point where the sounds stop is the Diastolic Blood Pressure. If no sounds, representing Blood Pressure, could be heard then a new attempt should be made after 3 minutes.

***Is there a way to know if I have high blood pressure?***

Hypertension (high Blood Pressure) is, usually, without specific symptoms and is detected either by accident or due to the complications caused by it. Symptoms that may occur include headache (in cases of hypertensive peak), tinnitus, blurred vision and abnormalities in heartbeats (arrhythmia).

***When a person is characterized as hypertensive?***

Blood Pressure is not the same throughout the day. For this reason, it is proposed to record Blood Pressure in the morning and afternoon, at rest, for one week and then have a doctor evaluate the measurements. It should be stressed, that someone is not characterized as hypertensive with only one high blood pressure measurement. If there is difficulty in recording or there are great variations of Blood Pressure from day to day, it is suggested to have a 24-hour monitoring of Blood Pressure (Ambulatory Blood Pressure Monitoring) with a portable monitor and recorder.

The results will show if hypertension or not is evident. There is, however, controversy over the higher and lower limits of Blood Pressure between European and American scientists (Table 1 and 2). High levels of Blood Pressure should be recorded in at least two different visits to the doctor or at least two high measurements at rest in a seated position in one doctor's appointment. Furthermore, it is not uncommon the individual to have the white blouse syndrome, that is, his/her pressure rises whenever he/she visits the doctor or the primary health care service (primary healthcare facility, regional or private medical office).

| Blood Pressure Category | Systolic Blood Pressure (mmHg) | Diastolic Blood Pressure (mmHg) |
|---|---|---|
| Ideal | Less than 120 | Less than 80 |
| Normal | 120-129 | 80-84 |
| High Normal | 130-139 | 85-89 |
| Stage 1 Hypertension | 140-159 | 90-99 |
| Stage 2 Hypertension | 160-179 | 100-109 |
| Stage 3 Hypertension | ≥180 | ≥110 |

**Table 1**. Ranges of Blood Pressure according to European Society of Hypertension and European Society of Cardiology (2013).

| Blood Pressure Category | Systolic Blood Pressure (mmHg) | Diastolic Blood Pressure (mmHg) |
|---|---|---|
| Normal | Less than 120 | Less than 80 |
| Elevated | 120-129 | Less than 80 |
| Stage 1 Hypertension | 130-139 | 80-89 |
| Stage 2 Hypertension | At least 140 | At least 90 |
| Hypertensive crisis | Over 180 | Over 120 |

**Table 2**. Ranges of Blood Pressure according to American College of Cardiology/American Heart Association (2017).

***What are the causes of Hypertension?***

In a lot of incidents the exact causes of hypertension cannot be defined. Unfortunately, some modern life habits affect the onset of hypertension. Smoking, obesity, the use of large amounts of salt in the diet, as well as the absence of fruit and vegetables from the diet, consumption of more than 2 alcoholic drinks a day, stress, lack of physical exercise and sedentary life are some of aggravating factors of hypertension.

Furthermore, kidney or thyroid diseases can cause high blood pressure. The use of contraceptive pills, especially those containing estrogen, pregnancy and advanced age may increase blood pressure, also. Finally, family history of hypertension is a prognostic factor for hypertension in the younger family members.

***What problems can Hypertension cause?***

Hypertension can cause a number of problems in the human body. The heart is forced to work more vigorously in order to send blood, and oxygen, in the various parts of the body. This very intense work causes thickening (hypertrophy) of the heart, limiting its elasticity, and gradually exacerbating it from too much effort. This condition is called heart failure.

High blood pressure is associated with arteriosclerosis, that is, the formation of atherosclerotic plaques in the arteries that carry the blood to and from the heart. It is gradually reducing the width and elasticity of the vessel, leading to a reduction in blood and oxygen circulation. Due to the above process, angina pectoris (chest pain) and coronary heart disease can occur. The non-elastic walls of the arteries are likely to promote blood clots formation, causing a stroke or heart attack. Hypertensive persons are 4-6 times more at risk to develop the above mentioned health problems (coronary artery disease, myocardial infarction and/or stroke).

Another health condition caused by hypertension is kidney disease and kidney failure. As the kidney is made up of many tiny vessels and hypertension, as has been reported, causes damage to the vessels, it is very likely that a hypertensive person demonstrates a disturbance in the ability of the kidney to remove waste products. Due to renal malfunction, hypertension is aggravated and the person does not respond easily to medication administered. Oedema (swelling) may also occur in the legs and urine production will be reduced. If kidney is irreversibly damaged, the individual may need to start renal replacement therapy with Heamodialysis or Peritoneal Dialysis for the rest of his life or undergo a kidney transplant.

Hypertension is likely to cause problems in the eye vessels, in particular the retina. The most common manifestation of the problem is blurred vision with scattered dots. The ophthalmologist will identify ocular vessel stenosis and possible bleeding.

Increased blood pressure is particularly dangerous during pregnancy, as it causes a phenomenon called pre-eclampsia, a condition that is threatening for both the mother to be and the fetus. It usually occurs after the 20th week of pregnancy and prevents the proper supply of oxygen and nutrients from the placenta to the fetus, resulting in low birth weight. The woman will experience oedema (swelling), severe anaemia, impaired liver function, and a decrease in platelet count, resulting in an increased chance of bleeding. If the condition is not detected early, seizures with severe effects on the oxygenation of the woman and the fetus may occur.

***Can I prevent or manage Hypertension?***

Hypertension can be prevented and treated. The main thing, is, first of all, to change everyday habits and if necessary to get the necessary medication.

Maintaining ideal body weight, depending on height and age, is essential. Regular exercise, not necessarily in a gym, helps both to reduce body weight and to lower blood pressure. Everyday walking or light exercises for 20-30 minutes is enough. Discontinuance of salt usage in the diet with increase in fruit and vegetables consumption, and limited use of alcohol also contribute to blood pressure control. An important factor in blood pressure management is smoking. All healthcare professionals and scientific associations involved in hypertension management, report that smoking cessation is very important

Finally, medication administration is required in people over 65 years of age or people with multiple risk factors, such as diabetes mellitus and high cholesterol. There is a wide variety of anti-hypertensive regimes, which should be given after a specialist's assessment and not taken without prescription and supervision. Medication adherence is necessary in order to effectively manage hypertension and protect the person from complications and side effects.

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