

Arterial Blood Pressure

Good blood circulation is obtained once the peripheral resistance (resistance encountered by the blood) has been overridden.

This happens through the pressure, which is used to pump the blood through the left ventricle and into the aorta.

When using the term 'blood pressure', we refer to 'the pressure prevailing in the vessels of the arterial vascular system'. The values of this pressure can vary.

We distinguish two types of blood pressure: the first type is the systolic pressure. It occurs when the left ventricle (systole) is contracting. The systolic pressure is defined by the cardiac output (volume of blood pumped per minute), by the elasticity of the vessels, by the peripheral resistance and by the volume of blood circulating. The systolic pressure will drop in case of decompensation of the heart, shock and haemorrhage and will rise in case of strain and hyperthyroid.

The second type of blood pressure is the diastolic pressure. It is measured when the left ventricle is refilling with blood and the aortal valves are closed (diastole). The diastolic pressure will drop in case of shock and haemorrhage and will rise in case of arterial stenosis, e.g. arteriosclerosis and renal disease.

You can measure both the systolic and the diastolic pressure with a sphygmomanometer. You attach an inflatable cuff around the upper arm and connect it with the sphygmomanometer. After having inflated the cuff, slowly release the air. Once you hear a 'tune' through the stethoscope – which is placed in the elbow – you look at the sphygmomanometer. The indicated value represents the systolic blood pressure. When you continue to slowly release the air from the cuff, you stop hearing the 'tune'. At that moment, the indicated value on the sphygmomanometer is representing the diastolic blood pressure.

Measuring Your Blood Pressure

About blood pressure

Blood pressure is the pressure exerted by circulating blood on the walls of blood vessels. It decreases between each heartbeat as the blood moves away from the heart.

- **Systolic pressure** (peak pressure) is caused by the left ventricle contracting and pumping blood through the blood vessels.
- **Diastolic pressure** (minimum pressure) is caused by the left ventricle refilling with blood when the valves of the aorta are closed.

Factors affecting blood pressure

Blood pressure can be affected by the elasticity of the vessels, the amount of peripheral resistance, the volume of blood pumped per minute, and the total volume of blood circulating.

The table below describes some conditions that result in a change of blood pressure.

If there is ...	Then possible conditions include...
a decrease in systolic pressure	<ul style="list-style-type: none"> • decompensation of the heart • shock • haemorrhage
an increase in systolic pressure	<ul style="list-style-type: none"> • strain • hyperthyroidism
a decrease in diastolic pressure	<ul style="list-style-type: none"> • shock • haemorrhage
an increase in diastolic pressure	<ul style="list-style-type: none"> • arteriosclerosis • renal disease

Equipment needed for measurement

Blood pressure is usually measured in the *brachial artery*, the major blood vessel in the upper arm. To do this, you need:

- a stethoscope, and
- a *sphygmomanometer*, which consists of an inflatable cuff attached to a pressure measurement device.

How to measure your blood pressure

Follow the steps below to measure the blood pressure in your brachial artery.

Step	Action
1	Fasten the cuff of the sphygmomanometer around your upper arm.
2	Place the chest piece of the stethoscope on the inside of your elbow and listen to your pulse.
3	Inflate the cuff until you can no longer hear your pulse and then slowly release the air.
4	As the cuff deflates, you will hear a whooshing or pounding sound (the 'tune') through the stethoscope. The reading on the sphygmomanometer when you first hear this sound is your systolic blood pressure .
5	As the cuff continues to deflate, the 'tune' will stop. The value on the sphygmomanometer when you stop hearing the sound is your diastolic blood pressure .