

Measuring High Blood Pressure

What are Korotkoff Sounds?

The 'Korotkoff sounds' are the sounds that a doctor or nurse listens for when they are taking your blood pressure. They are named after Dr. Nikolai Korotkoff, a Russian physician who described them in 1905, when he was working at the Imperial Medical Academy in St. Petersburg.

Korotkoff sounds are detected by listening with a stethoscope placed over the brachial (arm) artery just below a blood pressure cuff, as it is gradually deflated from a pressure high enough to occlude the artery and stop the blood flowing. As the cuff pressure reaches systolic pressure, the blood starts to flow, and a whooshing sound is heard (the first phase of the Korotkoff sounds). As the cuff is deflated further, the artery opens and closes, and the flow of blood is turbulent, so sounds are still heard. When the cuff pressure is less than the diastolic pressure, the artery is open all the time, and the flow of blood is smooth, and the sounds disappear. Systolic pressure is registered as the pressure at which the sounds are first heard, and diastolic as the pressure at which they disappear (phase 5 of the Korotkoff sounds).

What is an Electrocardiogram?

This test is used routinely in the evaluation of people with high blood pressure and is the traditional way of seeing if the hypertension has had any affect on the heart.

When heart muscle contracts, it creates an electrical impulse, which can be detected on the surface of the body. The electrocardiogram (ECG or EKG) is performed by applying six electrodes to the skin on different parts of the chest. Another four are applied to each wrist and ankle. These pick up the electrical signal coming from the heart, which is amplified and written out on a paper strip. Each electrode looks at the heart from a different viewpoint, and the electrical waveform is slightly different in each one. The pattern of waveforms in the different leads provides a lot of information about the structure and function of the heart.

For the evaluation of high blood pressure, the two most important things are whether the heart is enlarged, and whether there's any sign of damage from a heart attack.

Do You Have 'White Coat Hypertension'?

Some patients have what is called 'white-coat hypertension;' their blood pressure is consistently elevated in the doctor's office or clinic but normal at other times. It is called this because the patient is reacting to the white coat that the doctor or other caregiver is wearing. If your blood pressure is high when measured at the doctor's office or clinic but is low when you measure it yourself, you should mention that to your doctor so that a more thorough evaluation may be done.

Sometimes in these cases ambulatory blood pressure (ABP) monitoring will be used to further measure blood pressure. These devices take readings every 15 to 30 minutes throughout the day and night while you go about your normal daily activities. An analysis of these readings will clarify the status of your blood pressure.

Source: The Sixth Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure. NHLBI, November 1997.