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Blood Pressure Testing Is Mostly Inaccurate

By Dr. Mercola | August 9th, 2017

About 29 percent of American adults suffer from high blood pressure, according to the U.S. Centers for Disease Control and Prevention (CDC), and it ranks as the second greatest public health threat. Of the one-third of adults who have high blood pressure, only half have the condition under control, even with medication.

Your blood pressure is the force needed to push blood through your arteries coming from your heart to deliver oxygen rich blood around your body. When your blood pressure is measured, you get a high value (systolic) and a low value (diastolic). The high number measures the highest pressure that occurs in your blood vessels while your heart is contracting. The low value measures the pressure in your arteries between heartbeats when your heart is relaxed.

Usually the systolic pressure, or top number, offers the most information about how stiff your arteries are and how much pressure is needed to push blood around your body. This is a major risk factor for cardiovascular disease. But individually, an elevated systolic or diastolic blood pressure may be enough to make a diagnosis of high blood pressure.

Recent studies have demonstrated the risk of death from heart disease and stroke doubles with every 20 mmHg elevation in your systolic blood pressure or 10 mmHg elevation in your diastolic pressure in people ages 40 to 89.

High blood pressure, or hypertension, is diagnosed when your pressure measures greater than or equal to 140 mmHg systolic pressure and greater than or equal to 90 mmHg of diastolic pressure. However, to reach the conclusion about treatment for hypertension, your physician must first have an accurate measurement of your blood pressure.

Common Method of Measuring Blood Pressure May Be Inaccurate

The method of taking blood pressure was invented in 1881 and refined in 1905 when Russian surgeon Dr. Nikolai Korotkoff discovered the difference between systolic and diastolic blood pressure measurements. Today, sphygmomanometers, the machine that measures blood pressure, continue to measure the appearance and disappearance of sounds in the arteries, known as Korotkoff sounds, as the standard blood pressure measurement.

The blood pressure cuff usually measures the pressure in the brachial artery in your upper arm, but can also be measured using the femoral artery in your thigh. However, central aortic blood pressure (CBP) measurements are often considered a better prognostic marker

of cardiovascular disease and are a better indicator of the pressure experienced by your organs, such as your brain and kidneys. The downside to measuring CBP is that it requires an invasive procedure to determine the measurement.

Since the possibility of large differences between central aortic and peripheral (arm or leg) measurements could affect the decision to treat hypertension or direct the prescription of medication, researchers undertook a study to compare the differences between the two measurements. The researchers used data from over 2,500 people between 1950 and 2016 and compared their blood pressure cuff measurements against an invasive central aortic blood pressure measurement.

They found that peripheral cuff measurements were reasonably accurate when compared to the reference standard — or invasive CBP — in people who had blood pressure lower than 120/80 or those who had pressure higher than 160/100. At these extreme ends of the risk spectrum the accuracy was up to 80 percent.

However, the remaining population with blood pressure in the mid-range of systolic measurements between 120 and 159 mmHg and with diastolic measurements between 80 and 99 mmHg, the accuracy of the measure dropped dramatically to between 50 percent and 57 percent.

Inaccuracies May Be Related to Several Factors

As this study was performed retrospectively, it is impossible to determine why those blood pressure readings may have been inaccurate. However, there are several factors that play into the accuracy of your blood pressure reading that you should be aware of in order to ensure your pressure measurement is as accurate as possible.

✓ Cuff size The size of the cuff may change the blood pressure reading significantly. The blood pressure cuff will have an arm circumference range printed on the cuff. Using a cuff that is too small may artificially increase the systolic measurement between 10 mmHg and 40 mmHg.
✓ Placement of the cuff The cuff must be placed on a bare arm, not over clothing, with the edges of the cuff aligned and positioned at heart level, approximately 1 inch above the bend in your elbow. The sleeve of your shirt should be off and not rolled up.

✓ Hearing ability when using a stethoscope Many of the machines used today in hospitals and some clinics to take blood pressure are automated and don't require someone to manually listen for Korotkoff sounds in your brachial artery. However, there remain a large number of blood pressure measurements taken by an individual listening for the change in sounds in the brachial artery. Individuals who have some hearing loss may record an abnormal reading when they don't hear the change in sounds correctly.
✓ Machine calibration Home machines and automated machines must be accurately calibrated to ensure a proper reading. One study demonstrated some home pressure machines were off in up to 15 percent of patients. Readings from these machines may impact treatment recommendations.
✓ Body position Your body position has a great deal to do with how accurate a peripheral blood pressure measurement will be. The proper position is to have your feet flat on the floor, back supported in a chair, legs uncrossed for at least five minutes and your arm supported while sitting.
✓ Activity Talking to the person taking your blood pressure during the reading may increase your systolic pressure by 10 mmHg and a full bladder may increase your systolic reading by 10 mmHg. Prior to taking your blood pressure, it is important that you sit quietly for three to five minutes and do not exercise for at least 30 minutes prior to the reading.
✓ White coat hypertension In this instance your blood pressure consistently measures greater than 140/90 mmHg or above but measures less at home. For some people, seeing the doctor is an inherently stressful experience that may temporarily raise your blood pressure. An estimated 15 percent to 30 percent of people with documented high blood pressure have white coat hypertension.
✓ Nicotine, caffeine or alcohol All should be eliminated in the 30 minutes prior to having your pressure measured.

Both High and Low Measurements Linked to Health Risks

Accurate measurement of your blood pressure is necessary to prevent damage to your health and appropriately monitor your blood pressure. Both abnormally high and low pressure may be linked to health risks. Physicians will be concerned with low blood pressure when it triggers symptoms, such as:

✓ Dizziness	✓ Nausea	✓ Fainting
✓ Unusual thirst	✓ Lack of concentration	✓ Blurred vision

✓ Cold, clammy skin	✓ Rapid, shallow breathing	✓ Fatigue

Low blood pressure may be the result of prolonged bed rest, pregnancy, blood loss, endocrine problems or nutritional deficiencies. High blood pressure increases your potential risk for cardiovascular disease, kidney disease, loss of vision, stroke and sexual dysfunction. While you may experience symptoms of low blood pressure, you often won't experience any immediate symptoms of high blood pressure. This is why the condition is called the silent killer, as the initial symptoms may be a stroke or heart attack.

Assess Your Risk of Hypertension Without Measuring Blood Pressure

Another noninvasive method of measuring your risk of hypertension without visiting the physician's office is to use your waist-to-hip ratio. Research suggests your waist size may be an effective measure for assessing obesity-related hypertension risk. If you have a high waist-to-hip ratio, i.e., you carry more fat around your waist than on your hips, you may be at an increased risk for obesity-related hypertension.

To calculate your waist-to-hip ratio, measure the circumference of your hips at the widest part, across your buttocks, and your waist at the smallest circumference of your natural waist, just above your belly button. Then divide your waist measurement by your hip measurement to get the ratio. The Mayo Clinic uses the following waist-to-hip ratio designations to evaluate your health risk:

Waist-to-Hip Ratio Norms

Gender	Excellent	Good	Average	At Risk
Gender: Male	Excellent: <0.85	Good: 0.85 - 0.89	Average: 0.9 - 0.95	At Risk: ≥0.95
Gender: Female	Excellent: <0.75	Good: 0.75 - 0.79	Average: 0.8 - 0.86	At Risk: ≥0.86

Hypertension Typically a Symptom of Insulin and Leptin Resistance

Typically, high blood pressure is a symptom of insulin and leptin resistance. This means the vast majority of people may be able to normalize their blood pressure using dietary and lifestyle changes that avoid side effects from antihypertension drugs. However, if you are currently on medication, it is important you remain on the medication while making changes to your diet in order to reduce the potential for a stroke or heart attack while naturally bringing your blood pressure to within normal limits.

One of the primary responses to a high-carbohydrate and processed food diet is an over production of insulin and leptin. As these rise, they also cause your blood pressure to rise. Elevated uric acid levels are also associated with hypertension. This means the program you choose should also address normalizing your insulin sensitivity and your uric acid levels. Interestingly, by eliminating excess sugar and fructose in your diet you'll address these issues all at once.

Standard Medical Treatment for Hypertension Not Risk Free

In my interview with Dr. Andrew Saul, we discuss beta-blocker drugs commonly used in the treatment of high blood pressure. Yet, despite having over 100 antihypertension drugs approved and available on the market, the number of people whose blood pressure is not under control continues to rise.

Beta-blockers are commonly used anti-hypertension medications that come with a laundry list of side effects, including cardiac failure or infarction (heart attack), impaired kidney function, depression and ischemic colitis. Diuretics may be used to help your body reduce a fluid overload. Side effects may include Stevens-Johnson syndrome, impaired hearing, abdominal pain and arthritic pain.

Calcium channel blockers are a type of antihypertensive medication for which side effects include edema, dizziness, nose bleeds, rash and tinnitus. In fact, none of the medications your physician may prescribe to control blood pressure are free of side effects.

Nitric Oxide Dump May Be Exactly What You're Looking For

Exercise is an important lifestyle strategy that can help normalize your blood pressure. In this video I demonstrate the nitric oxide dump exercise I do daily. The exercise takes just three minutes, and should ideally be done two to three times a day, with at least two hours between each session.

I am now convinced that this gentler strategy, which has not been evaluated or compared to the HIIT protocols discussed in previous articles, is a far healthier strategy to obtain the benefits of HIIT without the downside. I only wish I had known about this more effective approach earlier. This type of exercise stimulates the release of nitric oxide (NO) stored in your endothelial cells in your blood vessels. NO effectively:

- Causes your blood vessels to relax and dilate, lowering your blood pressure
- Stimulates and improves your immune function
- Decreases the viscosity of your blood, reducing platelet aggregation and the potential for stroke or heart attack
- Provides powerful anabolic stimulus, or increases lean body mass

Start With Lifestyle Choices to Regulate Your Blood Pressure

The most effective way to normalize your blood pressure is through healthy lifestyle choices. High blood pressure is typically associated with insulin resistance. Insulin helps your body to store magnesium, which helps relax your muscles. If your cells have grown resistant to insulin, you won't be able to store magnesium, which leads to blood vessel constriction and rising blood pressure.

Trans fat is now known to trigger atherosclerosis (hardening of your arteries). This is another trigger for hypertension, so avoiding all trans fats or hydrogenated fats may help prevent

atherosclerosis. This includes margarines, vegetable oils, butter-like spreads and baked goods.

If your blood pressure is running high, you need to restore your insulin and leptin sensitivity, and the following five strategies are among the most effective for doing so:

• Avoiding processed foods (as most are high in sugar/fructose, grains, harmful fats and artificial ingredients)

• Making real food, ideally organic and locally grown, the focus of your diet

• Swapping net carbs for healthy fat. Sources of healthy fats to add to your diet include:

✓ Avocados	✓ Butter made from raw, grass-fed organic milk	✓ Raw grass fed dairy	✓ Organic pastured egg yolks
✓ Coconuts and coconut oil	✓ Unheated organic nut oils	✓ Raw nuts, such as pecans and macadamia, which are low in protein and high in healthy fats	✓ Grass fed meats or pasture raised poultry

• Intermittent fasting is one of the most effective ways I've found to normalize your insulin/leptin sensitivity. It's not a diet in conventional terms, but rather a way of scheduling your eating to promote efficient energy use. Essentially, intermittent fasting means eating all your calories during a specific window of time each day, and fasting during the rest. When you eat, your body reacts by elevating insulin and leptin.

Starchy carbohydrates cause a far greater insulin elevation than protein, while fat requires no insulin for digestion. If you're constantly snacking (or drinking) on sugary fare, your insulin/leptin levels will remain chronically elevated, which tends to promote high blood pressure.

The more sensitive your body is to insulin/leptin, the more likely you'll be to use the food you consume efficiently, which will help improve insulin resistance, and promote weight loss and the creation of muscle. Your body is most sensitive to insulin/leptin following a period of fasting. (Fasting also boosts growth hormone secretion — another important key to weight loss and muscle growth.)

• Exercising regularly. On a side note, I recommend training yourself to breathe through your nose when exercising, as mouth breathing during exercise can raise your heart rate and blood pressure, sometimes resulting in fatigue and dizziness.