

Blood Pressure Measurement

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Blood pressure (BP) is the measure of the force or pressure exerted by the circulating blood upon the blood vessel walls (Arteries). It is produced by the contraction of the heart muscle. It is recorded in two numbers. The **Systolic** (top) is the measurement after the heart contracts and pushes out the blood. It is at the **highest pressure**. The **Diastolic** (bottom) is the measurement when your heart is relaxed between beats and before the heart contracts again. It is at the **lowest pressure**. It is one of the principal vital signs. We use a blood pressure cuff to measure the pressure. Blood pressure is usually measured on a person's upper arm. It is measured in millimeters of mercury (mm Hg).

Normal resting blood pressure for an adult is approximately

120-129	Systolic Pressure – Highest- appearance of sound
----- mm Hg	
80 -84	Diastolic Pressure – Lowest – disappearance of sound

High Blood Pressure /Hypertension

High blood pressure is measured when the blood pressure in the arteries is elevated and the heart has to work harder than normal to pump the blood through the blood vessels. High blood pressure is the number one risk factor for **stroke** and a major risk factor for **heart disease**. It is very important to have your blood pressure checked at least once a year if you always have maintained normal blood pressure. If you have experienced high blood pressure your doctor will want you to check your blood pressure more often. Check with your doctor how often he or she would like you to have your blood pressure checked. If you have one high reading, you should have it checked at least two more times on different days to determine if it is continually high. It is best to keep a record of your blood pressure on a tracking card. It will help you and your doctor determine if your blood pressure is within a healthy range or consistently high.

High – normal blood pressure for an adult is approximately

130-139	Systolic Pressure – Highest- appearance of sound
----- mm Hg	
85-89	Diastolic Pressure – Lowest – disappearance of sound

High blood pressure (measured by a doctor or healthcare provider)

140	Systolic Pressure – Highest- appearance of sound
----- mm Hg	
90	Diastolic Pressure – Lowest – disappearance of sound

Factors That Can Cause High Blood Pressure

There are many factors that can cause high blood pressure. Some factors you can't control, such as gender, ethnicity and age. Many factors can be controlled, such as; diet, exercise, smoking and stress.

Controlling High Blood Pressure

1. Medications

- a) Medications may have to be prescribed for high blood pressure.
- b) Medications should always be taken as directed by a doctor.

2. Diet:

- a) Eat a healthy, balanced diet based on Canada's Food Guide. A diet lower in fat (saturated and trans fats) and include lots of healthy fruits and vegetables.
- b) Reduce the amount of sodium in your diet. There are high amounts of sodium in snack foods and foods that are smoked, salted, cured or canned. The Heart and Stroke Foundation recommends Canadians eat less than 2,300 mg of sodium a day (about 1 tsp./ 5 ml of salt).

3. Exercise:

- a) Do moderate to vigorous intensity aerobic physical activity for at least 150 minutes per week or approximately 20 minutes per day.

4. Body Weight

- a) Maintain a healthy body weight. Losing even 5% to 10% of your body weight can help reduce high blood pressure and decrease your chances of stroke or heart attacks.

5. Smoking

- a) Do not smoke.
- b) If you are smoking, see your doctor to find out ways to help you quit smoking.
- c) Minimize your exposure to second hand smoke.

6. Alcohol

- a) If you drink, limit yourself to 2 drinks a day with a weekly maximum of 10 for women, and 3 drinks a day with a weekly maximum of 15 for men.
- b) Do not drink if you are taking medications or other drugs.

7. Stress

- a) Minimize stress by avoiding; smoking, alcohol, and too much TV.
- b) Find ways to manage stress
 - i) Physical activity
 - ii) Socializing
 - iii) Laughter
 - iv) Healthy eating
 - v) Time for yourself

Taking Your Blood Pressure At Home

It can be beneficial to take blood pressure at home as well. Home monitoring can assist your doctor in being able to diagnose blood pressure correctly. Some people are more anxious when they visit the doctor's office and it is possible they may have higher blood pressure for appointments. Blood pressure can return to normal once you return to your daily activities.

Masked hypertension can also occur. You experience normal blood pressure during your doctor's appointments but have elevated blood pressure in other daily situations. If you have an increased risk of stroke or heart disease or have kidney disease or diabetes, your doctor may ask you to monitor your blood pressure at home to rule out the risk of masked hypertension.

Steps To Ensure Accurate Blood Pressure Readings

1. Do not smoke 30 minutes before testing.
2. Do not drink caffeine 30 minutes before testing (coffee, tea, pop, sports drinks)

3. Rest, sit quietly, both feet flat on the floor, and back resting on the chair for 5 minutes before measuring and during measuring.
4. Do not measure blood pressure when you are upset or in pain.
5. Empty your bladder and bowel before starting if needed
6. Always use the same arm and remove bulky or tight clothes.
7. Wrap the cuff snugly around your bare, upper arm, 1 – 2 cm above your elbow. Have your doctor or pharmacist help you to choose a cuff size.
8. Place your arm on a firm surface or table. The cuff must be at the level of your heart.
9. Do not talk or watch TV.
10. Take one reading and record it.
11. Always bring your readings with you to your doctor's appointments.

***The Heart and Stroke Foundation recommends using a home-automated unit instead of a manual one for more accurate readings.

Manual Blood Pressure Steps

- 1. Choose the right equipment:**
 - a) A quality stethoscope
 - b) An appropriately sized blood pressure cuff
- 2. A blood pressure measurement instrument such as an aneroid or mercury column sphygmomanometer or an automated device with a manual inflate mode.**
- 3. Prepare the patient**
 - a) Make sure the patient is relaxed by allowing 5 minutes to relax before the first reading.
 - b) The patient should sit upright with their upper arm positioned so it is level with their heart and feet flat on the floor.
 - c) Remove excess clothing that might interfere with the BP cuff or constrict blood flow in the arm.
 - d) Be sure you and the patient refrain from talking during the reading.
- 4. Choose the proper BP cuff size**
 - a) Most measurement errors occur by not taking the time to choose the proper cuff size.
 - b) Wrap the cuff around the patient's arm and use the INDEX line to determine if the patient's arm circumference falls within the RANGE area. Otherwise, choose the appropriate smaller or larger cuff.
- 5. Place the BP cuff on the patient's arm**
 - c) Palpate/locate the brachial artery and position the BP cuff so that the ARTERY marker points to the brachial artery.
 - d) Wrap the BP cuff snugly around the arm.
- 6. Position the stethoscope**
 - e) On the same arm that you placed the BP cuff, palpate the arm at the ante cubital fossa (crease of the arm) to locate the strongest pulse sounds.
 - f) Place the bell of the stethoscope over the brachial artery at this location.
- 7. Inflate the BP cuff**
 - a) Begin pumping the cuff bulb as you listen to the pulse sounds.
 - b) When the BP cuff has inflated enough to stop blood flow you should hear no sounds through the stethoscope. The gauge should read 30 to 40 mmHg above the person's normal BP reading. If this value is unknown you can inflate the cuff to 160 - 180 mmHg. (If pulse sounds are heard right away, inflate to a higher pressure.)
- 8. Slowly Deflate the BP cuff**
 - a) Begin deflation.

- b) The pressure should fall at 2 - 3 mmHg per second, anything faster may likely result in an inaccurate measurement. *

9. Listen for the Systolic Reading

- a) The first occurrence of rhythmic sounds heard as blood begins to flow through the artery is the patient's systolic pressure. This may resemble a tapping noise at first.

10. Listen for the Diastolic Reading

- a) Continue to listen as the BP cuff pressure drops and the sounds fade. Note the gauge reading when the rhythmic sounds stop. This will be the diastolic reading.

11. Double Check for Accuracy

- a) Take a reading with both arms and averaging the readings.
- b) To check the pressure again for accuracy wait about five minutes between readings.
- c) Typically, blood pressure is higher in the mornings and lower in the evenings. If the blood pressure reading is a concern or masked hypertension is suspected, a 24-hour blood pressure study may be required to assess the patient's overall blood pressure profile.

Alerts

- 1) Do not put a blood pressure cuff on the arm of a client who has had a mastectomy on that side. The veins cannot support the additional pressure experienced by the cuff.
- 2) In the case of a double mastectomy, a leg cuff should be used to obtain an accurate blood pressure reading.

Resource Websites

[http://www.heartandstroke.sk.ca/site/c.inKMILNIEmG/b.3657319/k.F889/Heart Disease Stroke and Healthy Living.htm](http://www.heartandstroke.sk.ca/site/c.inKMILNIEmG/b.3657319/k.F889/Heart_Disease_Stroke_and_Healthy_Living.htm)

<http://blog.suntechmed.com/blog/32-bp-measurement/220-10-steps-to-accurate-manual-blood-pressure-measurement>