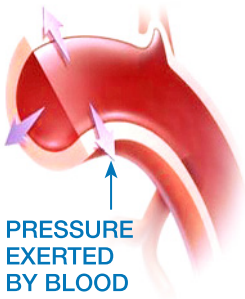


What is high blood pressure?



To understand **high** blood pressure, you must first understand what blood pressure is. Very simply, this refers to the force of blood against the walls of your arteries. Think of this as water rushing through a pipe. You may find it easier to understand more about blood pressure and blood flow if you understand more about **how your heart works**.

High blood pressure can cause damage to the walls of your arteries. This can create scarring, which in turn causes fatty plaque to build up, contributing to the narrowing and blocking of your arteries. Your heart will become strained and weakened. Blood vessels in your brain can burst—causing a stroke—if your blood pressure is very high. Your

blood pressure varies during the day, moving up and down, often linked to activity or the lack of it (for example, your blood pressure is usually lowest at night but rises quite quickly once you get out of bed in the morning). Everyone's blood pressure goes up occasionally if, for example, something has frightened you, or you are angry or feeling stressed. But when your blood pressure remains high for long periods of time it means you have high blood pressure. This is also referred to as **hypertension**, a term you may hear your doctor use.

Blood pressure is measured with two numbers—**systolic** and **diastolic**. The systolic is an indication of how much pressure there is in the arteries (the maximum amount) when the left ventricle of the heart contracts. The diastolic indicates what the pressure is in your arteries between heartbeats.

There are several categories of blood pressure levels, which are all measured as mmHg (millimetres of mercury). Let's look at some numbers:

Normal blood pressure	120 mmHg or less (systolic) and 80 mmHg or less (diastolic)
Prehypertension	120-139 mmHg (systolic) or 80-89 mmHg (diastolic)
High blood pressure	Stage 1 = 140-159 mmHg (systolic) or 90-99 (diastolic) Stage 2 = 160 mmHg or higher (systolic) or 100 mmHg (diastolic)

High blood pressure is referred to as a 'silent' disease, because it often has no symptoms. This is why regular check-ups with your doctor are a good idea.

How your heart works

You've probably heard the heart described as a pump, which is really the simplest description of this remarkable organ. It is not much bigger than your fist—and yet every single day it can pump about 7,500 litres of blood throughout your body, and beat about 100,000 times. Your blood carries oxygen and nutrients, which your body needs to survive.

Think of it like this. An electrical system controls your heart, putting out little signals that make the walls of your heart contract. Every contraction makes blood pump into your circulatory system. This system—which is made up of blood vessels called arteries, capillaries and veins—pumps blood into every part of your body. The valves in your heart—aortic, pulmonary, mitral and tricuspid – make sure that the blood flows the right way. If your heart is not pumping properly, blood won't circulate.

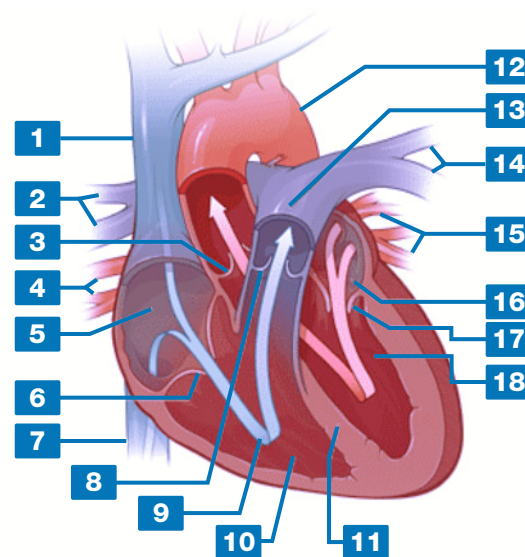
The right ventricle pumps blood from your heart to your lungs. Every time you take a breath, oxygen moves from your lungs to your blood vessels and gets added to your blood.

Blood flows through your heart like this: the inside of your heart is divided into four separate chambers. The top two are called atria, and their job is to collect blood. The two on the bottom are called ventricles, which pump the blood out. The left side of the heart pumps this oxygen-rich blood through your arteries, the oxygen gets used, and then your veins carry it back to the right side of your heart. It is a continuous and intricate system of pumping and circulation.

What is prehypertension?

We previously showed you the numbers (systolic and diastolic) which would indicate prehypertension: 120-139 mmHg (systolic) or 80-89 mmHg (diastolic). **This is sometimes also referred to “high-normal” blood pressure, and Canadian doctors believe that about 2.5 million Canadians have it.** In new guidelines that look at the management and treatment of high blood pressure it has been reported that **as many as one million people** with high-normal blood pressure will develop full-blown high blood pressure over the next four years, greatly increasing their risk of heart attack and stroke.

If you have high-normal blood pressure, you might be headed towards a situation where you will need medications for life. But by making lifestyle changes, you can get your blood pressure down to a safe range—and then by keeping it at this level, you can delay your chances of developing high blood pressure for many years.



1. Superior vena cava (from upper body)
2. Right pulmonary arteries (to right lung)
3. Aortic valve
4. Right pulmonary veins (from right lung)
5. Right atrium
6. Tricuspid valve
7. Inferior vena cava (from lower body)
8. Pulmonary valve
9. Direction of bloodflow
10. Right ventricle
11. Septum
12. Aorta (to body)
13. Pulmonary artery
14. Left pulmonary arteries (to left lung)
15. Left pulmonary veins (from left lung)
16. Left atrium
17. Mitral valve
18. Left ventricle



What's your number? Make sure you see your physician or go to your local pharmacy as soon as you can to have your blood pressure checked.

If you would like to discuss, don't hesitate. Local pharmacies are not appropriate for diagnosis of high BP, but can be useful and are quite accessible for screening.

Let's consider some other numbers that have led doctors to be more and more concerned about the management and treatment of high blood pressure in Canada:

- **44%** of us don't know the difference between normal blood pressure and high blood pressure
- **80%** of people don't know that there is a link between high blood pressure and heart disease
- **63%** of us don't think high blood pressure is a serious problem
And **38%** of us think we can treat it without the help of our doctors.

How many people have high blood pressure?

Over 5 million Canadians are known to have high blood pressure. But because there are often no symptoms, 42% of people don't even know they have it. Even among people who *do* know they have high blood pressure, less than one-third get proper treatment. These are alarming statistics and one of the reasons why it is important that you have your blood pressure checked on a regular basis. Early detection means early treatment and much less risk to your overall health.

Worldwide, high blood pressure is still the number one cause of death, and the second major cause of disability after malnutrition in children. In the year 2000, it was estimated that 927 million people around the world had high blood pressure, and this number is expected to rise to about 1.5 billion by the year 2025—an increase of about 60%. This points out how big a challenge this health condition

What are the risk factors for high blood pressure?

In more than 90% of people with high blood pressure, the exact cause isn't known. When doctors are unable to figure out what's causing your high blood pressure, they call it **essential high blood pressure** or **essential hypertension**. **Secondary hypertension** describes a condition which is caused by another condition (see box). But we do know some of the things that are risk factors for high blood pressure, and that contribute to the disease.

Think about blood pressure this way... When you turn on the tap at home, you can see how much water pressure there is. To keep your pipes unclogged, you need an adequate amount of pressure. But if the pressure is too high, it can put a strain on your plumbing system, causing leaks and other damage.

Too much blood pressure can put too much pressure on your arteries.

Secondary hypertension can be caused by...

- Kidney disease
- Overactive adrenal glands or other endocrine disorders
- Pregnancy, in some women
- Medications that increase the risk of high blood pressure like oral contraceptives or oral decongestants

For example:

- Age can be a factor. Men over 45 and women over 55 are at higher risk. Blood pressure does rise as we get older.
- People of certain races are more likely to have high blood pressure, like those of Hispanic or African descent. This last group gets high blood pressure at an earlier age, and it tends to be more severe. Despite the fact that they are more likely to know they are at risk, and will seek treatment sooner, they are less likely to reach the desired treatment goals, and more likely to die prematurely from diseases related to high blood pressure like coronary artery disease or stroke.
- Being obese or overweight is linked to many diseases and conditions. Although not everyone who is overweight will develop high blood pressure, the link is clear.
- Tobacco use—cigarettes, cigars, and chewing tobacco—all increase blood pressure, both while you're using them and long-term (causing arteries to narrow).
- Alcohol use. Although several studies in recent years have shown a benefit to heart health from the use of moderate amounts of alcohol, drinking 3 or more drinks a day is linked to high blood pressure and an increased risk of dying from heart disease.
- Lack of exercise. An inactive lifestyle leads to an increased risk of having high blood pressure.
- Genetics do play a role in the development of high blood pressure. If a family member has it, you may develop it too—but often it is due to common lifestyle traits—like obesity or use of alcohol. Still, if you have a family member with high blood pressure, be sure to tell your doctor.

Did you know...?

According to the Heart and Stroke Foundation, proper diagnosis and treatment of high blood pressure will reduce your risk of stroke by 40% and your risk of heart attack by as much as 25%.

High blood pressure hurts

We described earlier how your heart functions. This very finely-tuned 'instrument' works very hard. When you have high blood pressure, this workload—for both your heart and your arteries—becomes considerably increased. Over time, if your heart has to work at this extra hard level, it can become enlarged, and if it becomes too large, it might not be able to do all of the things your body needs it to do.

High blood pressure is the biggest risk factor for stroke. But it can also cause heart attacks, kidney failure, or hardening of the arteries (called atherosclerosis). Your risk factor for these other diseases is directly related to how high your blood pressure is. High blood pressure is also a significant risk factor for coronary artery disease, congestive heart failure, peripheral vascular disease—which describes a condition that obstructs the arteries, mostly in the legs—dementia, and atrial fibrillation (an abnormal heart rhythm that affects the two atria of the heart).

The American Heart Association provides some examples:

Supposing you were a 50-year old man of average weight—but your blood pressure was 146/86, a number we have already explained is high. In comparison to someone with normal blood pressure, your **risk of dying from a heart attack would be three times higher**, and your **risk of death from a stroke four times higher**. You would be doubling the risk of heart failure and tripling your risk of developing kidney disease.

In another example, a 40-year-old woman, Julie has severely elevated blood pressure, at 146/86. Like the 50-year-old man, Julie has **tripled her risk of dying from a heart attack**, and she is **four times more likely to die from a stroke**. Her risk of developing heart failure or kidney disease is three times higher.

Can high blood pressure be prevented?

Yes, if you can make changes to your lifestyle, you have a good chance of preventing or at least delaying the development of high blood pressure (see more in the **Living well** section). Increasing your level of exercise, adjusting your eating habits, using alcohol moderately, reducing your salt intake, and losing weight are all good prevention tools.

Weight loss is one very good example of a prevention strategy. One study looked at the positive effect that weight loss had on blood pressure levels. The study results showed that high blood pressure could be prevented even if the weight loss was moderate.

In this study, overweight men and women were divided into two groups, by age—with about the same number in the younger age group (30-49) and in an older age group (ages 50-65). The study showed that the people who lost 15 pounds or more over a period of four years reduced their long-term risk of developing high blood pressure—28% among the younger study participants, and 37% in the older group. **Even a smaller 4 to 8 pound weight loss made a difference** if it was kept off for 4 years, of about 20-22% reduction in the risk of high blood pressure among all those who participated.

How is high blood pressure diagnosed?

With high blood pressure, there are rarely any symptoms. You cannot feel high blood pressure, and you cannot look at another person and think they might have it, even if they seem very stressed or are overweight. This is why having your blood pressure regularly checked is so important. After the age of 18, this should be done at least once every 2 years, and more frequently as you get older and certainly if you have already been diagnosed with high blood pressure.

We've all seen the blood pressure machines in pharmacies or shopping malls. Since they may not be completely accurate, and may provide inconsistent results, you should not rely on them for a true reading of your blood pressure level. They are not a substitute for a consultation with your doctor, and provide only numbers—not any advice on how to interpret the results or what to do next. However, they can give you an idea of your blood pressure level, and you can consult with your pharmacist to make sure you are using these machines correctly. You can also monitor your blood pressure at home using a recommended self-monitoring unit. This is particularly important if you have already been diagnosed with high blood pressure or high-normal pressure.

One high blood pressure reading at your doctor's office doesn't always mean you have high blood pressure. Many things can affect the test results, and you should have it tested again a couple of times in the next few days to see if the measurement is about the same. Some of us suffer from what the medical profession refers to as "white coat hypertension". This syndrome means that our concern about a health problem may cause us to be anxious while visiting our doctor, which causes blood pressure to rise.

To prepare for having your blood pressure measured, it is best to:

- avoid caffeine, and try not to eat for about half an hour before you are tested
- dress in loose, comfortable clothing; make sure you can easily bare your arm for the test
- try not to drink alcohol for about 8 hours prior to the test

High blood pressure and diabetes

Most patients with diabetes have high blood pressure

35% to 75% of the complications of diabetes are linked to high blood pressure

Treating high blood pressure in people with diabetes reduces deaths, heart attacks, strokes, and progressive kidney failure

- tell your doctor or the nurse if you are feeling sick, or are stressed
- make sure you tell your doctor if you take medications of any kind
- relax before the test; take deep breaths or sit quietly for a few minutes

Your blood pressure will be tested using a sphygmomanometer, which features an inflatable cuff attached to your arm and a meter to measure the pressure. The test is painless and takes only a minute.

If you have high blood pressure, a visit to your physician will probably include the following:

Your blood pressure will be checked at each visit. By keeping a careful record of your blood pressure levels, your doctor will know if your blood pressure is being maintained at the proper level.

Your doctor may encourage you to use a device to monitor your blood pressure at home.

Your doctor will probably screen you for [diabetes](#). If you have diabetes, it is tremendously important that your blood pressure be controlled, and your physician will be aiming for a blood pressure goal of less than 130/80 mmHg. Keep in mind that you may need to take 3 or more drugs to achieve this blood pressure goal.

Your overall cardiovascular disease risk will be assessed. Your physician may look at your smoking habits (if applicable), your cholesterol levels, and your level of activity.



Monitoring your blood pressure at home: a do-it-yourself tool

You can buy a blood pressure monitor for home use at most pharmacies, and your pharmacist can help you select one. Make sure to buy one that is recommended by the Canadian Hypertension Society—it will have this symbol on the box.

You should look for a monitor that measures your blood pressure in your upper arm, rather than a unit designed for use on wrist or fingers, as these may not provide accurate results.

Not only will learning to measure your blood pressure give you some peace of mind—and a continuing record of how diet, exercise, medications and daily routine affects it—it will also be a useful tool for your doctor. You can keep track of your blood pressure levels by recording them in a little diary or a chart. Some monitors have a memory and this will allow your physician to see all of your readings.

How is high blood pressure treated?

Recommendations for lowering your blood pressure are often just common sense, but not always easy to do.

These include:

- eating a balanced diet, using Canada's Food Guide to help you plan meals and snacks
- getting regular exercise—150 minutes per week if possible; look for exercises that you enjoy and can easily incorporate into your daily routine without a lot of expense
- reducing your salt, fat and alcohol intake
- learning to manage stress
- if you smoke, stop; ask your doctor or pharmacist about a smoking cessation program

When lifestyle modifications like weight loss, dietary changes, and/or increased physical activity are not successful at treating high blood pressure, your doctor may recommend medication. There are different classes of these medications, which are called antihypertensive medications. Your physician will explain to you why he or she has selected a particular medication. The most commonly prescribed classes of drugs include:



Angiotensin II Receptor Blockers (ARBs) relax blood vessels by blocking a chemical that makes vessels tighten or become narrow, which allows blood to flow through your body more easily.

Angiotensin Converting Enzyme (ACE) Inhibitors reduce the production of an enzyme that produces something called angiotensin II, which narrows or tightens blood vessels. Their action lowers your blood pressure by allowing blood to flow more easily through your body.

Beta Blockers lower blood pressure by slowing down your heart rate, your heart's pumping action, and how much blood your heart pumps each minute.

Diuretics, sometimes called "water pills", help your kidneys get rid of more salt, which reduces blood volume and lowers your blood pressure.

Calcium Channel Blockers or **Calcium Channel Antagonists** block the entry of calcium into muscles that control blood vessel size. This opens up your blood vessels, allowing for blood to flow more easily and reducing your blood pressure.

The choice of drug depends on whether you have other risk factors or complications. If one drug or class of drugs doesn't work for you, your doctor may switch you to another class. It is also quite common to take combination therapy—that is, two or more drugs—in order to effectively control your blood pressure. Combination therapy is generally needed if you have diabetes or kidney disease as well as high blood pressure.

Your doctor will discuss these options with you, and will help you understand when and how to take these medications. As with any medication, take these as prescribed, and don't stop taking them without first discussing it with your healthcare professional. If you experience side effects, tell your doctor or pharmacist, but don't stop taking your medicine.

Tell your doctor or pharmacist if you are taking any over-the-counter medications or dietary supplements, since some of these may have an effect on your blood pressure medications.

What are the benefits of treatment?

Here are some real, measurable benefits from being treated successfully for high blood pressure:

- If you are younger than 60 years old, treatment leading to a reduction of your blood pressure by 10/5 or 6 mmHg will help reduce your risk of stroke by **42%**, and your risk of a coronary event (like a heart attack) by **14%**.
- If you are older than 60, your overall risk of dying from high blood pressure is reduced by **20%**, and your risk of death from cardiovascular disease is decreased by **33%**. Your chances of having a stroke are reduced by **40%**, and coronary artery disease is reduced by **15%** with a reduction of your blood pressure by 15/6 mmHg.

Did you know that if the average daily intake of sodium (salt) was reduced from 3500 mg to 1700 mg...

...there would be 1 million fewer people in Canada with high blood pressure, and 5 million fewer doctor visits for it

...there would be a 13% reduction in cardiovascular disease

...our healthcare system would save over \$13.3 billion dollars a year

Living well

Here are some easy ideas that will help you lower and maintain your blood pressure, help you feel better and may even save you money!

Eat well

- Try to eat more fresh foods, particularly fruits and vegetables. Select those that are high in potassium but low in sodium—like bananas, cantaloupe, and nectarines, asparagus, broccoli, and potatoes.
- Check the labels for fat content, sugar content, and sodium. Try to eat foods that have less than 200 mg of sodium or less than 10% of the daily value per serving.
- Don't eat foods that contain a lot of salt—like crackers, chips, processed lunch meats, or some pickled foods.
- Don't use sauces as often.
- Eat at home more often, and avoid fast food restaurants.
- To flavour your food, use other spices in place of salt. Lemon or lime juice, fresh garlic, a splash of wine—all make good substitutes.
- Don't add salt while you're cooking, or at the table.
- Choose grains and grain products.
- Eat lean meats, fish, and poultry.
- Emphasize low fat or non-fat dairy products.
- Add nuts and legumes to your diet.

Much of this advice forms the basis of the DASH (Dietary Approaches to Stop Hypertension) diet, which is outlined (complete with recipes) at the following website address: http://www.nhlbi.nih.gov/health/public/heart/hbp/dash/new_dash.pdf

Ask your physician or pharmacist for a referral to a dietitian, or find one through www.dietitians.ca.

Get physical

Exercise regularly. Talk to your doctor about an exercise program that is right for you, pick an exercise program that appeals to you, and ask a friend to join you.

Watch your weight. A healthy BMI (body mass index) is 18.5-24.9 kg/m². If you don't know what your BMI is, click here to calculate it <http://www.nhlbisupport.com/bmi/bmicalc.htm>. You should also keep an eye on your waistline. Ideal waist circumference measurements are as follows:

European, Sub-Saharan African, Middle Eastern

Men less than 94 cm

Women less than 80 cm

South Asian, Chinese Japanese

Men less than 90 cm

Women less than 80 cm

Losing weight should be done carefully—no more than half a pound to 2 pounds per week.

Real changes make real differences

- Cutting out 1800 mg of salt per day: systolic blood pressure will be reduced by 5.1 mmHg, diastolic by 2.7 mmHg
- Losing 1 kg of weight: systolic blood pressure will be reduced by 1.1 mmHg, diastolic by 0.9 mmHg

Walking will get you everywhere...

It will take you to the park and take you to the pool. And it will improve your blood pressure level.

But it will also help reduce your risk for coronary artery disease, lower your cholesterol level, help you maintain an ideal weight, help keep your bones healthy, and improve your mood.



- Incorporating 120-150 minutes of exercise per week: systolic blood pressure will be reduced by 4.9 mmHg, diastolic by 3.7 mmHg
- Eating according to the DASH diet: systolic blood pressure will be reduced by 11.4 mmHg, diastolic by 4.5 mmHg

Resources:

There are many good resources for people with high blood pressure, and their families. Several good books and magazines focused on high blood pressure and heart health are available through libraries or your local book stores, including ones on meal planning and recipes.

Websites of interest:

The Heart and Stroke Foundation

www.heartandstroke.ca

Blood Pressure Canada

www.hypertension.ca/bpc/

Canadian Hypertension Society

www.hypertension.ca

American Heart Association

www.americanheart.org

Dietitians of Canada

www.dietitians.ca

The DASH Diet

www.dashdiet.org

National Heart, Lung and Blood Institute

www.nhlbi.nih.gov/hbp/index.html

Canadian Diabetes Association

www.diabetes.ca