BLOOD PRESSURE PREVENTION AND MANAGEMENT

High blood pressure is called the “silent killer” because it usually has no symptoms and causes no discomfort. You can have it and not even know it. But, high blood pressure can kill or disable you. People with high blood pressure have a much greater risk of having heart attacks and strokes. Fortunately, high blood pressure is easily detected and treated.

**What Is Blood Pressure**

Blood circulates through a network of arteries, veins, and capillaries to deliver food and oxygen to all the cells of the body. The heart provides the force to push the blood through this network of vessels. The force or pressure of the blood against the walls of the arteries is known as blood pressure.

Your arteries are similar to a rubber garden hose with water running through it. As the water flow is increased at the faucet, the walls of the hose expand to allow more water to flow through without increasing the pressure on the hose very much. But, if something happens to cause the hose to become rigid or narrower, there is increased resistance to the flow of water through the hose. The pressure inside the hose increases. The hose could even burst.

The same thing can happen in your arteries. The pressure of the blood against the walls of your arteries can increase because of several factors, including:

- An increase in the amount of blood pumped through the blood vessels.
- An increase in the resistance to blood flow. Resistance may result from narrowing of the blood vessels or stiffness in the walls of the blood vessels. Stiffness decreases the walls’ ability to expand or widen.

**Causes of High Blood Pressure**

In over 90 percent of people with high blood pressure, the exact cause of their high blood pressure is unknown. The most important cause of high blood pressure is probably your genes. The tendency to develop high blood pressure seems to run in families. While you can’t change your genes, you can change or control many of the other risk factors for high blood pressure. By managing the risk factors you can control, you can help prevent your blood pressure from getting high in the first place, or control it if it is already high.
Complications of High Blood Pressure

The medical term for high blood pressure is hypertension. Over time, high blood pressure can damage your blood vessels and lead to serious health problems.

Atherosclerosis, angina, and heart attack - High blood pressure speeds up the development of atherosclerotic plaques that can clog arteries and cut off the blood flow to the heart muscle. Limited blood flow to the heart muscle can lead to angina (chest discomfort) or even a heart attack.

Stroke - Similar to a heart attack, a stroke is a “brain attack.” Atherosclerotic plaque that builds up in the arteries of the head and neck can limit blood flow to parts of the brain. This is the most common cause of stroke. A stroke can also occur when high blood pressure causes weakened blood vessels in the brain to burst. Stroke can cause permanent disability or death.

Peripheral vascular disease - Atherosclerotic plaque can also build up in the arteries of the legs. This may result in severe pain during physical activity, a condition called intermittent claudication. Some people with intermittent claudication are unable to walk even one block without having to stop because of severe leg pain.

Congestive heart failure - High blood pressure makes it harder for the heart to pump blood through the blood vessels. Like any muscle that is overworked, the heart walls may become thickened and enlarged. An enlarged heart can’t pump normally, so blood backs up in the lungs and other organs. Congestive heart failure is the result, and it is an extremely serious condition.

Kidney damage - High blood pressure can damage the blood vessels in the kidneys. Damaged kidneys can’t filter the blood adequately and waste builds up in the blood. If the kidneys fail, dialysis is needed to filter the blood.

Eye damage - High blood pressure can damage the blood vessels of the eyes. Blindness can result.

Understand Your Numbers

It is easy to know if you have high blood pressure. Blood pressure is measured with an instrument called a sphygmomanometer. A rubber cuff is wrapped around the upper part of your arm. The cuff is slowly inflated, then the air is slowly released. Two blood pressure numbers are taken using a stethoscope. Both are important.

Systolic blood pressure (top or high number) is the pressure inside your arteries when the heart contracts and pumps blood into your arteries.
**Diastolic blood pressure** (bottom or low number) is the pressure inside your arteries when the heart is relaxing and filling with blood.

**Classification and Management of Blood Pressure for Adults (18 Years and Older)**

<table>
<thead>
<tr>
<th>Category</th>
<th>Systolic (mmHg)</th>
<th>Diastolic (mmHg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>Less than 120</td>
<td>Less than 80</td>
</tr>
<tr>
<td>Pre-Hypertension</td>
<td>120 – 139</td>
<td>80 – 89</td>
</tr>
<tr>
<td>High Blood Pressure</td>
<td>140 – 159</td>
<td>90 – 99</td>
</tr>
<tr>
<td>If you are a Diabetic</td>
<td>130 or above</td>
<td>85 or above is considered HBP</td>
</tr>
</tbody>
</table>

**Diagnosing High Blood Pressure**

A single blood pressure reading that is high doesn’t necessarily mean you have high blood pressure. Because your blood pressure can change from time to time, several readings may need to be taken to get an accurate reading. If your blood pressure reading is high, you will need to have at least two readings taken on two or more separate occasions to confirm if you have high blood pressure.

To ensure your blood pressure readings are accurate, ideally you shouldn’t have your blood pressure taken if you have:

- Smoked within 30 minutes of the reading
- Drank caffeine or alcohol within 30 minutes
- Engaged in moderate or vigorous physical activity within the hour
- Eaten a meal within an hour
- Taken an antihistamine or cold medicine within the past 6 hours

Stress can also cause blood pressure to increase temporarily. In fact, some people get nervous during a visit to their doctor’s office and this causes their blood pressure to increase. They are said to have “white coat” or “office” hypertension.

Some medical conditions, such as kidney disease and hormone abnormalities, are the cause of high blood pressure in a small percentage of individuals. In such cases, blood pressure may be controlled by treating the disease. Your doctor may run a series of tests to exclude such diseases if you are diagnosed with high blood pressure.
The goal of prevention and management of high blood pressure is to reduce the risk for the complications of high blood pressure in the safest way possible.

*If your blood pressure is normal* – You may be able to prevent it from getting high by following the recommended healthy lifestyle habits.

*If you have pre-hypertension* – You may be able to bring your blood pressure down into the normal range by changing some of your lifestyle habits. This will prevent you from developing high blood pressure in the future.

*If you have high blood pressure* – You may be able to bring your blood pressure down into the normal range by changing some of your lifestyle habits. This could mean you wouldn’t have to take medications.

*If you must take medications to control your blood pressure* - You should still practice a healthy lifestyle. Your medications will work better for you when combined with healthy practices. You may be able to take less medicine or give up medicines over time.

**Healthy Lifestyle Habits:**

- Achieve and Maintain a Healthy Weight—If you are overweight your heart has to work harder to pump blood through your body. Losing weight and keeping it off will bring your blood pressure down. Follow the eating and exercise plans recommended for you.
- Exercise Regularly—People who are physically active are less likely to develop high blood pressure. And, those with high blood pressure have been able to reduce their blood pressure by participating in regular exercise. Some who were on medications were even able to give up their blood pressure medicine altogether.

**Special Exercise Tips for People With High Blood Pressure**

- Do not exercise if your resting systolic blood pressure is above 200 mmHg and/or diastolic blood pressure is above 115 mmHg.
- Be aware that certain blood pressure-lowering drugs can lower your heart rate during exercise.
- Be especially careful to warm-up and cool-down if you are taking medications to lower your blood pressure.
• When performing strength training exercises use lighter weights or less resistance and perform more repetitions. Ten to 15 repetitions of each exercise are recommended.

**Eat Healthy**

What you eat can affect your blood pressure. A recent project, called D-A-S-H – “Dietary Approaches to Stop Hypertension” – demonstrated that a food plan rich in fruits, vegetables and low-fat dairy products with a reduced content of saturated fat and total fat – results in blood pressure reductions similar to those seen with medications.

**Reduce the Sodium in Your Diet**

For some people who have high blood pressure, reducing the amount of sodium they eat or drink helps bring down their blood pressure. While this doesn’t work for everyone, most people could benefit from eating less sodium – less than 2,300 mg per day.

**Limit Your Alcohol**

High blood pressure is one complication of drinking too much alcohol. If you drink, do so in moderation - no more than two drinks a day for men and no more than one drink a day for women and lighter weight persons.

When faced with choices for beverages in a social setting, choose wine or beer over hard liquor. Mix wine with soda water or fruit juices to dilute the alcohol. Also remember, alcohol is a major source of calories. If you are trying to manage your weight, limiting your alcohol is a good idea.

**Understand the Role of Drug Therapy**

When making the decision to start you on drug therapy for high blood pressure, your doctor will consider three important factors:

1. How high your blood pressure is
2. Your other risk factors for heart disease
3. Other diseases and complications of high blood pressure you may have

Generally, drugs are not the first step in controlling your blood pressure unless it is so severe that immediate action is necessary. If you have high blood pressure, your doctor
will likely use a stepwise approach with lifestyle as the first step – weight loss, healthy eating, and regular exercise.

If you have not been able to bring your blood pressure under control by making lifestyle changes, a medication may also be prescribed. While it might be possible to step down your drug therapy or discontinue it over time, when you start the medication, you should expect to take it for the rest of your life.

Your doctor will work with you to find the best drug or combination of drugs and the right dosage for you. This may require “trial and error” because no one drug is perfect for everyone. All of the drugs can have side effects. Some do not interact well with other drugs you must take for other health conditions. Fortunately, there are many different blood pressure medications for your doctor to choose from.

Questions for Your Doctor

It is your right, and responsibility, to know about the medications you will take. Ask your doctor these 10 questions.

1. Why do you think I should take this medicine?
2. What’s the generic as well as the trade name of this drug?
3. Will it interact positively with other medications I’m taking? (Be prepared to list all medications you’re taking, including over-the-counter medications).
4. How do you recommend I take this drug? (For example, with meals or on an empty stomach?)
5. What side effects should I be watching for? Should I report them to you right away or wait until our next visit?
6. For how long should I expect to take this drug?
7. When should I have my blood pressure re-checked?
8. Are there any other tests, such as blood tests, that I will need while taking this medication?
9. If you are involved in an exercise plan: Will this drug affect my heart rate during exercise? If yes, how?

Medication Tips

- Check your prescription before you leave the pharmacy to be sure it is correct. Feel free to ask the pharmacist any questions you may have.
- Store you medicine in a room where the humidity is low and the temperature is fairly constant. The bathroom is not necessarily the best storage place.
- Store all medicines in their original containers. Do not remove labels. Do not mix several kinds of medicines in one container.
- Keep all medicines out of the reach of children.
• Take your medicine at the same time each day. Establish a regular, easy to remember routine. Ask someone to remind you or ask if you have taken your medicine.
• If you miss a day’s dosage, don’t double up the next day.
• Never stop taking your medicine without talking to your doctor. The medicine only controls your blood pressure while you are taking it. If you stop, your blood pressure goes back up. If this happens too quickly, it could be dangerous.
• Keep a record of all side effects of medications and report them to your doctor.
THE METABOLIC SYNDROME

The metabolic syndrome was first identified in the 1980s. It was previously known by other names, such as syndrome X, pre-diabetes, or the insulin resistance syndrome. It is characterized by the presence of several specific risk factors for coronary heart disease in one person. People with the metabolic syndrome have a much higher risk of developing coronary heart disease (the cause of heart attacks and the number one killer of adults), stroke, and type 2 diabetes. They are also more likely to develop other conditions, such as polycystic ovarian syndrome in women, certain types of liver disease, gallstones, asthma, sleep problems, and some cancers. Overall, the metabolic syndrome increases a person’s risk of early death to about the same degree as cigarette smoking.

The American Heart Association estimates that at least 47 million adults living in the US (about 24 percent) have the metabolic syndrome. About the same percentage of men as women have the metabolic syndrome. However, African American and Mexican American women are more likely to have the metabolic syndrome than their male counterparts. In adults 60 years of age and older, about 45 percent have the metabolic syndrome. Pediatricians report that children as young as seven years of age are developing the metabolic syndrome, a condition once seen only in adults.

Fortunately, the metabolic syndrome is usually preventable and treatable with lifestyle changes and, if necessary, medications. The greatest potential for prevention and treatment of the syndrome lies in reversing its root causes – overweight/obesity and physical inactivity.

Know If You Have the Metabolic Syndrome

Features of the Metabolic Syndrome

No single test can identify the metabolic syndrome. The U.S. National Cholesterol Education Program’s Adult Treatment Panel III (ATP III) established five features for the diagnosis of the metabolic syndrome. If you have any three or more of the features presented in the table below, you have the metabolic syndrome. Ask your mentor to help you determine if you have the metabolic syndrome.

<table>
<thead>
<tr>
<th><strong>ATP III Features</strong></th>
<th><strong>Defining Levels for the Metabolic Syndrome</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Abdominal obesity</td>
<td>Waist measurement</td>
</tr>
<tr>
<td></td>
<td>• Greater than 40 inches (102 cm) in men</td>
</tr>
<tr>
<td></td>
<td>• Greater than 35 inches (88 cm) in women</td>
</tr>
<tr>
<td>High triglycerides</td>
<td>150 mg/dl or higher</td>
</tr>
<tr>
<td>Low HDL (“good”) cholesterol</td>
<td>• Less than 40 mg/dl (1.0 mmol/L) in men</td>
</tr>
<tr>
<td></td>
<td>• Less than 50 mg/dl (1.3 mmol/L) in women</td>
</tr>
<tr>
<td>High blood pressure</td>
<td>130/85 mmHg or higher</td>
</tr>
</tbody>
</table>
High fasting blood glucose | 100 mg/dl or higher

**Do You Have Abdominal Obesity?**

It is easy to know if you have abdominal obesity by measuring your waist circumference.

**Tips for Measuring Your Waist**

- Measure your waist without clothing or in your underwear.
- Stand very straight with your abdomen relaxed.
- Use a cloth tape measure that does not stretch.
- Place the tape in a horizontal position at your natural waist (the narrowest part of your torso). Do not measure the waist at the level of the navel. The value may be too large.
- Take the measurement as you exhale a normal breath.
- Do not pull the tape too tightly around the waist or compress the skin with the tape.

Although abdominal obesity is a key feature of the metabolic syndrome, keep in mind that some individuals can have the metabolic syndrome with lesser degrees of or no abdominal obesity.

**Do You Have the Metabolic Syndrome?**

Fill in your current levels for each risk factor listed below. Compare your levels to the levels defining the metabolic syndrome in the table above. Determine your total number of features for the metabolic syndrome.

<table>
<thead>
<tr>
<th>Feature</th>
<th>Current Level</th>
<th>Do You Have This Feature?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abdominal obesity</td>
<td>___ inches</td>
<td>Yes No</td>
</tr>
<tr>
<td></td>
<td>(or ___ cm)</td>
<td></td>
</tr>
<tr>
<td>High triglycerides</td>
<td>___ mg/dl</td>
<td>Yes No</td>
</tr>
<tr>
<td>Low HDL (“good”) cholesterol</td>
<td>___ mg/dl</td>
<td>Yes No</td>
</tr>
<tr>
<td>High blood pressure</td>
<td>___ mmHg</td>
<td>Yes No</td>
</tr>
<tr>
<td>High fasting blood glucose</td>
<td>___ mg/dl</td>
<td>Yes No</td>
</tr>
</tbody>
</table>

*My total number of features for the metabolic syndrome: ________*

If you have three or more features, you have the metabolic syndrome. The more features of the metabolic syndrome you have, the greater your risk for the complications of the metabolic syndrome, especially heart attack, stroke, and type 2 diabetes.
The root causes of the metabolic syndrome are overweight/obesity and physical inactivity. Insulin resistance and a number of other factors, including genetics, are also believed to play an important role.

**Overweight/Obesity**

Overweight and obesity are associated with the metabolic syndrome. Many experts believe the “obesity epidemic” is mainly responsible for the increasing number of people with the metabolic syndrome in the United States. (Two out of three American adults are considered overweight or obese.) However, abdominal obesity, identified by an increased waist measurement, is a better predictor of the metabolic syndrome than body weight alone. Too much abdominal fat is believed to trigger the release of several harmful substances into the bloodstream.

**Physical Inactivity**

Not getting enough exercise is a potential underlying cause of all of the five features of the metabolic syndrome—abdominal obesity, high triglycerides, low HDL (“good”) cholesterol, high blood pressure, and high fasting blood glucose. Approximately 70 percent of U.S. adults can be classified as being sedentary.

**Insulin Resistance**

When you eat sugars and starches, your body changes them into a form of sugar called glucose. Glucose enters your blood and is carried to all of the cells of the body where it is ready to be used for energy. The hormone insulin, which is produced in your pancreas, is responsible for moving the glucose out of the blood and into your cells.

Insulin resistance is present in the majority of people with the metabolic syndrome. Insulin resistance occurs when your body does not respond to insulin as it should and resists taking glucose into the cells. If your cells can’t use the glucose in the blood, high blood glucose levels can develop. Too much glucose in the blood is harmful and can cause damage to organs in the body. Moreover, insulin resistance forces the pancreas to produce extra insulin in order to move glucose into cells. High levels of insulin in the blood also have harmful effects on the body, including the increased storage of fat in the abdomen. People with insulin resistance often go on to develop type 2 diabetes.

People with diabetes who also have the metabolic syndrome are at greater risk for complications than people with diabetes who don’t have the metabolic syndrome. People with diabetes and the metabolic syndrome should be especially sure to lead a healthy lifestyle and take the other necessary steps to manage their diabetes and various features of the metabolic syndrome.
The cornerstone of prevention and treatment of the metabolic syndrome is lifestyle management. The safest and most effective way to improve all of the risk factors for the metabolic syndrome is by eating healthy, losing weight and keeping it off, and increasing your physical activity.

If you have the metabolic syndrome, your doctor may ask you to take actions in addition to making lifestyle changes. If your blood glucose is high, you may need to monitor your blood glucose and keep records of your results. You may also need to see your healthcare provider for cholesterol, triglyceride, and blood glucose tests every three months or so until your values are at goal level. If you are not able to improve your risk factors through lifestyle changes alone, your doctor may prescribe medications to lower your blood pressure, control your cholesterol or triglycerides, and/or control your blood glucose level. Your doctor may also prescribe other medications, such as aspirin, to reduce your risk for a heart attack and stroke. If you have the metabolic syndrome and type 2 diabetes, you are at very high risk for cardiovascular disease.
PREVENTING AND REVERSING CORONARY HEART DISEASE

Coronary heart disease is the disease that causes heart attacks. Coronary heart disease occurs when blockages build up inside the coronary arteries. Blockages begin to build up inside our coronary arteries during childhood. As we age, the blockages progressively get worse and ultimately may trigger a heart attack or sudden death.

There is currently no cure for coronary heart disease – not medications, not angioplasty, not bypass surgery. If you have coronary heart disease, it is likely to get worse unless you do something to change or manage certain conditions or behaviors, called risk factors.

But there is good news! One of the most exciting discoveries in medicine in recent years is that it is possible to slow down the build-up of blockages inside coronary arteries. It is even possible to cause existing blockages to be partially removed. This process is called reversal of coronary heart disease and it results from risk factor modification.

Understanding Coronary Heart Disease

Cardiovascular disease is the number one killer of Americans. More than 58 million Americans have one or more types of cardiovascular disease. Of the various types, coronary heart disease, the disease causing heart attacks, causes the most deaths. Someone has a heart attack every 29 seconds and coronary heart disease claims one life every minute. And, it places a $50 billion annual burden on our country's economy. In the 20 minutes or so it takes you to read this, more than 40 Americans will have a heart attack.

Although common among seniors, coronary heart disease is not a disease that affects only the elderly. Many of the people with coronary heart disease are in their most productive, middle-aged years. Five percent of all heart attacks occur in people under the age of 40, and 45 percent occur in those younger than 65.

Learn How the Heart Works

Your heart is a muscular pump about the size of your fist. It is located behind your breastbone, a little to the left of the center of your chest. It is part of the body's cardiovascular system. Along with the lungs, arteries, veins, and capillaries, the heart delivers oxygen-rich blood to organs and tissues throughout the body including the heart muscle itself.
This diagram assumes you are facing the body (as if looking in a mirror).

The heart has four chambers. The upper two chambers are the right atrium and left atrium. The lower two chambers, right ventricle and left ventricle, have thick, muscular walls. The left ventricle has the thickest walls of all of the chambers.

As a general rule, veins carry blood to the heart and arteries carry blood away from the heart. Pulmonary veins and pulmonary arteries transport blood between the heart and lungs. The largest artery in the body is the aorta. It carries blood from the heart to the brain and other parts of the body.

Valves separate the four chambers of the heart and keep the blood moving in the right direction. Think of valves as swinging doors that are pushed open in one direction and then quickly slam shut.

Your Coronary Arteries

Just like all other tissues and organs in your body, your heart muscle (called the myocardium) needs blood and oxygen to survive. The heart muscle gets its blood and oxygen from the coronary arteries. The constant supply of fresh, oxygen-rich blood delivered by the coronary arteries ensures that your heart has the energy it needs to continue pumping.
Know How Coronary Heart Disease Develops

Coronary heart disease, the disease causing heart attacks, occurs when blockages build up in the coronary arteries. These blockages are called atherosclerotic plaque and the process by which blockages build up is called atherosclerosis.

Atherosclerosis develops slowly over many years and gradually gets worse throughout life. By the time we are in our teens, blockages have already started building up.

Risk Factors for Coronary Heart Disease

• Cigarette smoking
• High cholesterol
• High blood pressure
• Physical inactivity
• Obesity
• Stress
• Diabetes
• Age
• Sex
• Genetics

There are three major ways heart attacks can occur:

1. Blockages can gradually get worse. When coronary heart disease risk factors are present, atherosclerotic plaque gradually builds up day-by-day inside the coronary arteries. Once more than about two-thirds of the inside channel of the coronary artery has become blocked by atherosclerotic plaque, the heart muscle can no longer get the blood and oxygen it needs. This condition is called myocardial ischemia. Ischemia means "deficiency in the oxygen supply." It is most evident when the heart muscle needs extra oxygen – when it is pumping vigorously during exercise or in certain stressful situations.

If myocardial ischemia is accompanied by chest pain or discomfort, it is called angina pectoris. Angina is pain or discomfort in the chest caused when the heart muscle is not receiving enough blood and oxygen through the coronary arteries. Myocardial ischemia also may be accompanied by other symptoms, such as pain or discomfort in the neck, jaw, arms, upper back, or abdomen, or by an unusual shortness of breath. If myocardial ischemia is not accompanied by any pain or symptoms it is called silent ischemia.

While angina can be quite painful and alarming, it is not a heart attack. However, when the blood supply to the heart muscle is cut off for more than about 30 minutes, then damage starts to occur. The heart muscle cells begin to die. This irreversible damage is called myocardial infarction or heart attack. Infarction means "death of cells." There are usually symptoms associated with a heart attack, but not always. Heart attacks can also occur without pain (silent heart attack). After a heart attack, healing occurs, forming a scar.
2. The atherosclerotic plaque can become unstable and suddenly crack. As many as 90 percent of all heart attacks are believed to result from the cracking or rupture of an unstable atherosclerotic plaque. A variety of factors can cause the plaque to become unstable and trigger this event. When the plaque cracks, the blood cells start to stick together as the blood flows over the irregular surface. A blood clot forms which can completely block the flow of blood through the coronary artery. If this blood clot is not eliminated quickly, a heart attack occurs.

3. The wall of the coronary artery can go into spasm. Coronary spasm is like a cramp in the muscular wall of a coronary artery. The spasm clamps off the coronary artery and interrupts the blood supply to the heart muscle. Coronary spasm typically occurs at sites in the coronary arteries where plaque is present. Coronary spasm can cause angina and, if it lasts for more than about 30 minutes, may result in a heart attack. When angina occurs while a person is at rest, it is often due to coronary spasm.

Symptoms of Angina

Angina is the most common warning symptom of coronary heart disease. People with angina commonly describe their discomfort as "heaviness," "tightness," "pressure," "squeezing," "vice-like," "constricting," or "crushing." Although angina can vary greatly, here are a few other typical features:

- Generalized discomfort felt across the center of the chest in the region of the breastbone, rather than confined to a small area.
- Discomfort spreading to other nearby parts of the body, such as the neck, jaw, shoulders, arms, abdomen, or upper back. In some people the discomfort is felt only in these areas and not in the chest at all.
- Pain or discomfort lasting more than one minute but less than 20 minutes.
• Pain or discomfort typically brought on by exercise or emotional stress. It builds up gradually in intensity over several minutes, and then slowly goes away when the activity that caused it is stopped. It is not brought on or worsened by sudden, brief movements such as taking a deep breath or reaching for an object.

Symptoms of a Heart Attack

The chest discomfort you experience during a heart attack may be very similar to angina, except it lasts much longer. During a heart attack the discomfort often turns into severe pain that may be accompanied by nausea, sweating, shortness of breath, and dizziness. People experiencing symptoms of a heart attack often look unusually pale.

If you ever experience chest discomfort or other symptoms you think may be related to your heart, be sure to discuss this with your doctor as soon as possible. If your doctor has already said you have angina, be on the look out for any signs that your condition is getting worse, for example, angina that is more severe, longer lasting, brought on by less exertion, or occurring more often. When angina gets worse, it is called "unstable angina," and could be a warning of a possible heart attack. Schedule an appointment to see your doctor as soon as possible.

Warning Signs of a Heart Attack

You may experience any or all of these symptoms. Sometimes the symptoms go away then come back again.

• Uncomfortable pressure, fullness, squeezing, or pain in the center of the chest lasting more than a few minutes
• Pain spreading to the shoulders, neck, or arms
• Chest discomfort, lightheadedness, fainting, sweating, nausea, or shortness of breath

If you experience any of the symptoms for more than 15 minutes, get help immediately.

• Don’t delay. In the U.S., call 911 for emergency medical service or have someone drive you to the hospital emergency room, which ever is faster.
• Don’t try to phone your doctor to make an appointment.
• Don’t try to drive yourself.

Most of the damage occurring from a heart attack occurs within the first six hours. The faster you can get help, the greater the chance of limited damage to your heart and a quick and complete recovery.

If you are with someone who is having symptoms of a heart attack, expect him or her to deny the problem or make excuses.

• Don’t take no for an answer.
• Take action. Get the person to the hospital emergency room immediately.
- Learn CPR so you can help others. Ask those around you to learn it, too.

*If you go to the emergency room*, be prepared to tell the medical staff the following information:

- Symptoms
- When the symptoms started
- How the symptoms have progressed
- Any medications or actions taken
- The emergency room staff will work quickly to stabilize your condition.

**Know how Coronary Heart Disease is diagnosed, treated and even reversed:**

A. Common Diagnostic Tests
   1. Electrocardiogram or ECG/Exercise Stress Test
   2. Echocardiography
   3. Coronary Angiogram or Angiography

B. Treatment for Heart Problems
   1. Heart Medications
   2. Surgical Interventions and Procedures
   3. Cardiac Rehabilitation

For decades, scientists and doctors have studied why some people get coronary heart disease and others don’t. They have identified conditions and behaviors that put a person at an increased risk of developing coronary heart disease. These conditions or behaviors are called *risk factors*.

**Risk Factors You Can Control**

1. Cigarette Smoking

Even a single cigarette is harmful. Smoking can:

- Raise the heart rate and blood pressure, making the heart work harder.
• Interfere with the blood’s ability to carry oxygen to the heart muscle and other vital organs.
• Trigger heart rhythm problems (which can be very dangerous).
• Damage the inside lining of your arteries and contribute to the build up of plaque.
• Lower the HDL (good) cholesterol in your blood.
• Increase the stickiness of blood cells causing blood clots inside the coronary arteries and other arteries.
• Cause spasms in the coronary arteries.

If you smoke, the single most important thing you can do to reduce your risk for coronary heart disease is to quit smoking cigarettes completely.

2. High Blood Pressure

3. High Blood Cholesterol

An estimated 97 million American adults (51 percent) have high blood cholesterol levels. Cholesterol is a fat-like substance that circulates in the blood attached to protein substances. The combination of cholesterol and a protein is called a lipoprotein (lipo means fat). There are a number of different types of lipoproteins, but the two most important are LDL (low density lipoprotein) and HDL (high density lipoprotein). LDL is called "bad" cholesterol because it carries cholesterol to your coronary arteries and other arteries and allows it to build up as plaque. HDL is called "good" cholesterol because it helps remove cholesterol from the coronary arteries and prevents plaque build up. Think of the "L" in LDL as meaning "lousy" or "lethal" and the "H" in HDL as meaning "healthy" or "helpful."

4. Triglycerides

Triglycerides are another type of fat in the blood that contributes to coronary heart disease. Triglycerides can be lowered by losing weight if you are overweight and keeping it off, limiting the amount of fat and sugar you eat, participating in regular aerobic exercise, and limiting alcohol or not drinking at all.

5. Physical Inactivity

Studies show you can reduce your risk of coronary heart disease by as much as 50 percent by participating in aerobic exercise at least three times a week for at least 20 – 30 minutes. Exercise helps control blood pressure and diabetes, manage your weight, and relieve stress – just to name a few of its benefits.

6. Obesity

One-third of adult Americans weigh too much.
7. Diabetes

People with either type of diabetes are about three to five times more likely to develop coronary heart disease than people without diabetes.

8. Stress

We don't know for sure, but several studies suggest that how people respond to stress may influence their risk for coronary heart disease. These characteristics or conditions seem to put people at increased risk:

- Anger, hostility, and aggressive behavior (some of the components of the so-called Type A personality)
- Feeling out of control
- Depression
- Social isolation (lacking close ties with friends and family)

Risk Factors You Can't Control

1. Age and Sex

The risk of coronary heart disease increases with age. Risk begins to rise sharply for men after age 45 and for women after age 55.

2. Family History of Heart Disease

Your genes play an important role in your risk for coronary heart disease. Keep in mind that if coronary heart disease runs in your family, the increased risk may not necessarily be genetic in origin. It may be a matter of passing unhealthy habits and lifestyles from generation to generation. Even if coronary heart disease seems to run in your family, you can dramatically reduce your chances of having a heart attack by changing or managing the risk factors under your control.

Along with cigarette smoking, high blood pressure, physical inactivity, and obesity, high blood cholesterol is one of the five major risk factors for coronary heart disease. High cholesterol also increases your risk for strokes. Approximately 97 million American adults have high blood cholesterol levels. Triglycerides, another type of fat in the blood, also contribute to heart disease.
Learn About Cholesterol and Triglycerides

Cholesterol is a soft, white, fat-like substance made in the liver and found in your body's cells. It plays an important role in the production of cell membranes and sex hormones, as well as in the digestion of certain foods.

Only about seven percent of the cholesterol in your body circulates in your blood. Cholesterol can't dissolve in your blood. To travel to your cells, cholesterol must attach to a protein. The combination of cholesterol and protein is known as a lipoprotein (lipo or lipid means fat). Two of them are the most important to remember: LDL (low density lipoprotein) and HDL (high density lipoprotein).

LDL is called “bad” cholesterol because it causes atherosclerotic plaque to build up inside your coronary arteries and block the flow of blood to your heart muscle. Having a high HDL cholesterol level reduces your risk for coronary heart disease. HDL is called “good” cholesterol because it acts as a kind of scouring pad to remove cholesterol from the walls of your coronary arteries.

Triglycerides are fatty substances found in the bloodstream. Most of the body’s fat is stored in the form of triglycerides for later use as energy.

Causes of High LDL Cholesterol

Cells throughout your body remove cholesterol from the blood for use in various important cellular activities. As blood flows through the liver, special receptors on the surface of the liver cells remove some of the LDL cholesterol. The more LDL receptors your liver has and the more active they are, the more LDL is removed from your blood and the lower your LDL cholesterol.

The number of LDL receptors a person has is largely due to genetics. Eating large amounts of saturated fat is one of the most important factors affecting the activity of the LDL receptors. The more saturated fat you eat, the less active your LDL receptors. And, to make matters worse, when your LDL receptors become less active, your liver cells start to make more cholesterol. The end result is an increase in your LDL blood cholesterol level.

Major Factors Determining Your LDL Cholesterol Level

Genetic Factors

- Number of LDL receptors you are born with
- Activity level of your LDL receptors
- Amount of cholesterol made by your liver
**Lifestyle Factors**

- Amount of cholesterol you eat
- Amount of saturated fat you eat

**Other Factors**

- Certain diseases, such as thyroid problems, liver disease, diabetes, and kidney disease
- Some medications

**Understand Your Numbers**

Blood cholesterol levels should be measured in all adults 20 years or older. To get an accurate reading of LDL cholesterol and triglycerides, you must fast for 8 to 12 hours before the blood sample is taken. Fasting means eating no food and drinking only water.

**Cholesterol and Triglyceride Goals**

A total blood cholesterol level under 150 mg/dl is generally recommended. LDL should be less than 70 mg/dl for those with known cardiovascular disease. HDL should be greater than 40 mg/dl, but higher than 60 mg/dl is most beneficial. Triglycerides should be less than 150 mg/dl.
You can manage or control your cholesterol and triglycerides.

**Lowering LDL Cholesterol Through Healthy Eating**

1. Eat Less Saturated Fat
2. Eat Less Cholesterol
3. Eat Foods Containing Soluble Fiber

### Sources of Soluble Fiber

<table>
<thead>
<tr>
<th>Fiber (grams)</th>
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<tbody>
<tr>
<td>Oat bran, 1/3 cup</td>
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<tr>
<td>Oatmeal, 3/4 cup, cooked</td>
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<tr>
<td>Whole-wheat bread, 2 slices</td>
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<tr>
<td>Black-eyed peas, 1/2 cup cooked</td>
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<tr>
<td>Lentils, 1/2 cup, cooked</td>
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<tr>
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<tr>
<td>Pear, 1</td>
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### Three Types of Fat

1. Saturated fat

Saturated fat raises LDL cholesterol more than anything else you eat. Saturated fat is usually solid at room temperature and is commonly found in animal products. Your body does not need any saturated fat and there are no known potential dangers to eating as little saturated fat as possible.

2. Monounsaturated fat

When substituted for saturated fat, monounsaturated fat helps to reduce LDL cholesterol and can help to increase your HDL cholesterol.

3. Polyunsaturated fat

- **Omega 6** – found in vegetable oils, such as safflower, sunflower, soybean, corn, and cottonseed oil.
- **Omega 3** – found in oils from cold-water fish, such as salmon, trout, and mackerel.
4. Trans-fatty acids

Trans-fatty acids are created when liquid, unsaturated fat is changed into a more solid, saturated fat by hydrogenation, a process that adds hydrogen to fat.

**Increasing HDL Cholesterol**

It is more difficult to increase your HDL cholesterol than it is to lower your LDL cholesterol.

1. Exercise Regularly
2. Lose Weight
3. Stop Smoking
4. Alcohol

Alcohol is associated with an increase in HDL cholesterol, but because of many other harmful effects of drinking alcohol, we do not suggest you start drinking (if you are a non-drinker) or increase your drinking to raise your HDL.

**Reducing Triglycerides**

High triglyceride levels can result from being overweight, drinking too much alcohol, eating too many simple sugars (candies, sweets, sodas), being inactive, taking certain medications, or having diabetes or other disorders. Triglyceride levels can be lowered, often a great deal, by losing weight, exercising, eating less fat and simple sugars, and drinking less alcohol.

**Ways to Lower Your Triglycerides**

- Lose weight and keep it off
- Exercise regularly
- Eat fewer simple sugars (candies, sweets, sodas)
- Eat less fat
- Drink alcohol only in moderation or not at all