Lowering Blood Pressure

What is Hypertension?[1,2]

- Hypertension is also called high blood pressure. It is known as the “the silent killer.” This is because it may have no obvious symptoms.
- One in 3 adults (32%) have high blood pressure.
- High blood pressure increases your risk for heart disease and stroke. These are leading causes of death in the U.S.
- Risk factors for high blood pressure include family history of high blood pressure, age, African descent, high sodium diet, physical inactivity, obesity, high alcohol consumption, tobacco use, high cholesterol, sleep apnea, diabetes and stress.

How to Manage and Reduce High Blood Pressure: Dietary Considerations[1,3]

- The DASH Diet (Dietary Approaches to Stop Hypertension) is a heart healthy diet that focuses on lowering and preventing high blood pressure.
  - This eating plan is a low sodium diet. It includes fruits, vegetables, whole grains, and low-fat or non-fat dairy.
  - Foods that are high in fiber and rich in potassium, calcium, and magnesium are recommended.

The DASH Diet		
KEY POINTS • Reduce sodium (salt) intake. • Increase fruits, vegetables and whole grains. • Limit saturated fats and choose lean meats.		
Nutrient Type	Examples	Daily Servings and Sizes
Whole grains	Oatmeal, brown rice	6-8 servings per day
Vegetables	Broccoli, green beans	4-5 servings per day
Fruits	Strawberries, oranges	4-5 servings per day
Dairy	Low fat or fat free milk or cheese	2-3 servings per day
Lean meat, poultry & fish	Salmon, chicken breast	6 ounces or less per day
Nuts, seeds & legumes	Almonds, kidney beans	4-5 servings per week

- The American Heart Association recommends limiting sodium intake to less than 1,500 mg per day for people with high blood pressure.
- Read food labels to help you choose better options. Food options and recipes can be found online at dashdiet.org or heart.org.
- Keep a food diary to help to track your progress and improvements.
- Drink alcohol in moderation.
  - Men over 65 years of age and women of all ages should limit alcohol intake to 1 drink per day.
  - Men below 65 should limit to 2 drinks per day.
- Limit caffeine intake. Limit coffee to less than 2 cups per day. Switch to decaf, herbal tea, or teas containing hibiscus.
- Indulge in dark chocolate (about ½ oz per day). Make sure it contains at least 70% cocoa.
- Increase your intake of foods high in omega-3 fatty acids. These include salmon, tuna, and green leafy vegetables.
- Eat more highly colored fruits and vegetables, especially berries. These include blackberries, raspberries, blueberries, strawberries, and cranberries.

Lowering Blood Pressure

How to Manage and Reduce High Blood Pressure: Exercise and Physical Activity[1,4]

- Exercise and physical activity are excellent stress relievers. Exercising reduces physical and emotional tension.
- Women with a waist circumference greater than 35 inches and men with a waist circumference greater than 40 inches are at an increased risk for hypertension.
- If you are not currently exercising, start slowly with 10 minutes per day. Gradually increase the duration and intensity of your workouts. Aim for 30-60 minutes per day for most or all days of the week.
- To lose weight and lower blood pressure, 150 minutes per week of moderate activity or 75 minutes per week of strenuous activity is recommended.
- Consult with your doctor to determine what exercise regimen is safest and best for you.

How to Manage and Reduce High Blood Pressure: Additional Considerations[1,2]

- Avoid tobacco in any form and avoid second-hand cigarette smoke.
- Manage your stress. Chronic stress increases your risk for high blood pressure.
- Relaxing your mind and body for a few minutes each day could lower blood pressure by 10 or more points.
    - Try yoga, massage, meditation or deep breathing exercises.
- It is important to get enough sleep. Inadequate or poor-quality sleep can negatively affect your mood, mental alertness, energy level, and physical health.
- Blood pressure can change quickly and is influenced by many factors. One high reading does not mean that you have hypertension.
- Monitor your blood pressure at home. The best way to get an accurate picture of your blood pressure is to monitor it at home weekly and record your results.
- Take all blood pressure medications exactly as prescribed. Do not skip doses.
- Note any upward trends and factors impacting your blood pressure. Take your results to all health appointments.

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Lowering LDL

What is LDL?[1,2]

- LDL stands for low-density lipoprotein. It is frequently referred to as “bad cholesterol.”
- As LDL levels increase, this bad cholesterol can stick to the walls of your blood vessels. Lesions or “plaques” may form and eventually impede blood flow. Over time, this increases your risk for heart disease and stroke.
- High cholesterol has no symptoms. Many people do not know their cholesterol is too high. Millions of Americans have high cholesterol that is not managed appropriately.
- Risk factors for high LDL levels include age, gender, family history of high cholesterol, physical inactivity, tobacco use, obesity, a diet high in inflammatory fats, diabetes and stress.

How to Manage and Reduce LDL Cholesterol: Exercise and Physical Activity[1,5]

- Increase your physical activity and set a daily exercise goal. Exercising and losing weight can help reduce your bad cholesterol and increase your good cholesterol.
- Exercise and physical activity are stress relievers. Exercising reduces physical and emotional tension.
- If you are not currently exercising, start slowly with 10 minutes per day. Try walking, jogging or biking. Gradually increase the duration and intensity of your workouts. Aim for 30-60 minutes per day for most or all days of the week.
- Remember to discuss physical activity with your healthcare provider before starting a new exercise regimen.

How to Manage and Reduce LDL: Dietary Considerations[1,3,4,7]

- Increase your dietary fiber intake. Soluble fiber interferes with dietary cholesterol absorption and helps moderate blood sugar levels. Fiber also delays stomach emptying, which makes you feel full longer and helps with weight control.
- The American Heart Association recommends eating 25-30 grams total fiber every day from food, not supplements. All fruits and vegetables have both soluble and insoluble fiber, in varying quantities, so include a variety of them every day.

Soluble Fiber Food Sources Include:			
Apples	Celery	Lentils	Okra
Barley	Cucumbers	Nuts	Oranges
Beans	Dried peas	Oat bran	Pears
Blueberries	Eggplant	Oat cereal	Psyllium
Carrots	Flaxseeds	Oatmeal	Strawberries

- Eat foods containing omega-3 fatty acids and consider taking an omega-3 fatty acid supplement. Increasing dietary omega-3 fatty acids improves your cholesterol panel by increasing good cholesterol and reducing triglycerides.

Foods Containing Omega-3 Fatty Acids	
Food Sources	Examples
Fatty fish	Tuna, salmon, mackerel, trout, herring, sardines, halibut
Nuts and nut butters	Walnuts, almonds, hazelnuts, peanuts, pecans, pine nuts, pistachios
Oils	Olive oil, flaxseed oil, avocado oil, canola oil
Avocados	

How to Manage and Reduce LDL: Dietary Considerations, Continued[1,3,4,6,7]

- Lower your intake of dietary cholesterol and total fat.
- Total fat should be less than 25-35% of your daily calories. Choose healthy fats, like nuts, seeds, olive oil, fatty fish, and avocados.
- Limit animal fats like red meat, processed meats, full fat dairy, and other saturated fats. Saturated fats are those generally solid at room temperature. To reduce your risk of heart disease, keep saturated fats at less than 7% of total daily calories.
- Avoid trans fats whenever possible. Trans fats are found in hydrogenated and partially hydrogenated oils, shortening, stick margarine, commercially prepared baked goods, most fast food, and fried foods. They are also solid at room temperature. Trans fats lower HDL, increase inflammation in the blood vessels, and increase the tendency for blood clots to form in blood vessels.
- Increase your consumption of whole food-based plant sterols, like soy (in moderation), beans, fruits and vegetables, sunflower seeds, and wheat germ.
- Try red yeast rice. This supplement contains several natural ingredients that may help lower cholesterol.
- Keep a food diary to help to track your progress and improvements.

How to Manage and Reduce LDL: Additional Considerations[1,4]

- Remember, even if you are feeling fine, you should have your cholesterol checked routinely. Your healthcare provider will consider your cholesterol levels, family history and other risk factors that make heart disease or stroke more likely to occur.
- Avoid tobacco in any form and avoid second-hand cigarette smoke.
- Relaxing your mind and body for a few minutes each day can have a positive impact on your cholesterol. Try yoga, massage, meditation or deep breathing exercises.
- It is important to get enough sleep. Inadequate or poor-quality sleep can negatively affect your mood, mental alertness, energy level, and physical health.
- Take all cholesterol medications exactly as prescribed. Do not skip doses. Contact your physician or pharmacist before making changes to your medication regimen.

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Increasing HDL

What is HDL?[1,2,3,5]

- HDL stands for high-density lipoprotein. It is frequently referred to as “good cholesterol.”
- HDL “cleans” arteries by removing cholesterol from the blood and arterial walls. HDL transports cholesterol to the liver, which breaks it down for removal from the body.
- HDL can reduce inflammation in arteries damaged by plaques.
- Low HDL levels result in an increased risk of cardiovascular disease, even in people with normal LDL and total cholesterol levels.
- HDL levels above 60 mg/dL may protect against heart disease.
- Causes of low HDL cholesterol include family history, taking certain medications like beta-blockers or steroids, being overweight, smoking, stress, sedentary lifestyle, and consuming excess refined carbohydrates and trans fats.

How to Increase HDL: Exercise and Physical Activity[1,2,4]

- Aerobic exercise is an effective way to help increase HDL levels. Target at least 30 minutes of aerobic exercise per day, most or all days of the week. Try any activity that raises your heart rate, including walking, jogging, cycling, hiking, or swimming.
- Remember to discuss physical activity with your healthcare provider before starting a new exercise regimen.
- Achieve and maintain a healthy weight. If you are overweight, losing even a few pounds can increase your HDL. Focusing on diet and exercise suggestions for increasing HDL will help you target a healthy weight.

How to Increase HDL: Additional Lifestyle Modifications[1,2]

- Do not smoke. Smoking causes a decrease in HDL levels. Quitting smoking can result in a significant increase in HDL levels.
- Moderate alcohol consumption. Men should have no more than 2 drinks per day and women should have no more than 1 drink per day. While moderate alcohol consumption has been shown to raise HDL, it is not recommended that you consume alcohol to raise HDL levels.
- Reduce stress. High levels of stress can reduce HDL for some people.

How to Increase HDL: Dietary Considerations[5]

- Diet can have a positive effect on HDL levels and can improve HDL’s anti-inflammatory effects.
- Make an effort to increase your consumption of foods like olive oil, avocado, nuts and nut butters, fatty fish (ex: wild salmon, tuna, trout, halibut, sardines, mackerel, herring), brightly-colored fruits and vegetables, and whole grains.
- Avoid foods containing trans fats (ex: margarine, shortening, foods containing hydrogenated oils, fast food, commercially prepared baked goods, fried foods) and minimize refined (processed, white) carbohydrates (ex, white bread, crackers, pretzels, rice, sweets, snack foods, pasta, etc.).
- Limit saturated animal fats.
- Consider an omega-3 fatty acid supplement to help increase HDL levels.

How to Increase HDL: Additional Considerations

- When LDL, or “bad cholesterol,” is high, reducing LDL is priority over raising HDL, or “good cholesterol.”
- Take all medications exactly as prescribed. Typically, drug therapy is not recommended for low HDL cholesterol alone. Consult a healthcare provider before making medication changes.
- For those at risk for cardiovascular disease, consider regular exercise, quitting smoking, targeting an ideal body weight, and eating a healthy diet.

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Lowering Triglycerides

What are Triglycerides?[1,2,3]

- Triglycerides are fat-like substances in the blood. Everyone needs triglycerides, but it is possible to have triglyceride levels that are too high.
- High triglyceride levels are linked with an increased risk of heart attacks, strokes, and inflammation of the pancreas.
- A normal triglyceride level is < 150 mg/dL.
- Risk factors for elevated triglyceride levels include smoking, high blood pressure, being overweight, family history of heart disease, age, and diabetes.

How to Manage and Reduce Triglycerides: Lifestyle Modifications[1,2,3]

- Maintain a healthy weight. If you are overweight, losing 5%-10% of your total body weight will help reduce your triglycerides.
- Exercise regularly. Target at least 30 minutes of aerobic exercise per day, most or all days of the week. Try any activity that raises your heart rate, including walking, jogging, cycling, hiking, or swimming.
- Remember to discuss physical activity with your healthcare provider before starting a new exercise regimen.
- Limit alcohol consumption. Alcohol is broken down into sugar, which increases triglyceride levels. Men should have no more than 2 drinks per day and women should have no more than 1 drink per day. If your triglycerides are > 500 mg/dL, ask your primary care provider if it is safe to drink alcohol.

How to Manage and Reduce Triglycerides: Dietary Considerations[2,3]

- Limit your intake of sweets and sugar. Soda, candy, cookies, pies, pastries, cakes, sweet desserts, and concentrated fruit juices can increase triglycerides. Sugars should comprise only about 8% of your total daily calories. Be mindful of ingredients ending in "-ose" on food labels (ex: dextrose, fructose, maltose, sucrose) because these are sugars.
- Choose complex carbohydrates over simple carbohydrates. Foods made from or containing white flour, white rice, and/or added sugar can negatively impact triglyceride levels. These carbohydrates are quickly broken down into glucose, causing large spikes in blood sugar and causing your body to store the calories as fat. Instead, choose foods containing whole grains like 100% whole-grain bread, 100% whole-wheat pasta, whole oats and oatmeal (not instant), brown rice, quinoa, barley, and millet.
- Incorporate omega-3 fatty acids into your daily diet. Foods high in "healthy" fats include fatty or oily fish like salmon, tuna, herring, sardines, trout, and mackerel. Try to eat at least 2 servings of fatty fish per week. Additionally, include olive oil, ground flax seed, flaxseed oil, tofu or edamame, legumes, walnuts, and dark leafy green vegetables in your diet regularly. Also consider taking omega-3 supplements daily. Talk to your dietitian or pharmacist before beginning any new supplement regimen.
- Increase fiber intake to 25-30 grams per day. Foods high in fiber will help control your triglycerides and LDL, or "bad cholesterol." Increase dietary fiber slowly to avoid intestinal discomfort. Drink more water as your fiber intake increases. Examples of high fiber foods include whole grains, seeds and nuts, oat bran and bran cereals, beans, whole fruits, and vegetables. High fiber supplements containing psyllium, like Metamucil®, may also be helpful.

How to Manage and Reduce Triglycerides: Dietary Considerations, Continued[2,3]

- Eat a moderately low-fat diet. Choose fats wisely. Read food labels, limit saturated fats, and avoid trans fats. Foods high in saturated fats include fried foods, high-fat meats, skin-on poultry, many sauces and spreads, full-fat dairy (ex: milk, cheese, butter), many snack foods, and foods containing coconut and palm oils. Avoid trans fats by avoiding shortening, margarine, fast food, commercially prepared baked goods (biscuits, muffins, pastries, cookies, donuts, cakes, etc.) and foods with hydrogenated vegetable oil listed in the ingredients.

How to Reduce Triglycerides: Additional Considerations[2,3]

- Take all medications and supplements exactly as prescribed. Typically, drug therapy is not recommended for elevated triglycerides alone. Consult a healthcare provider before making medication changes.
- For those at risk for cardiovascular disease, consider regular exercise, quitting smoking, targeting an ideal body weight, and eating a healthy diet.

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Managing Blood Glucose Levels and Lowering Diabetes Risk

Why is Blood Glucose Important?

- Blood glucose is another name for blood sugar. It describes the concentration of glucose, or sugar, in the blood.
- The body uses glucose for energy production, and insulin is necessary for glucose to enter the body's cells.
- Type 2 diabetes is diagnosed when the pancreas fails to produce enough insulin or when the body's cells stop responding to insulin, resulting in excess glucose in the bloodstream. This is commonly referred to as "high blood sugar" or "insulin resistance."

Blood Glucose Levels

- A normal fasting blood glucose level is less than 100 mg/dL.
- Blood glucose levels between 100 mg/dL and 125 mg/dL, after fasting overnight, indicate the body is in a pre-diabetic state.
- Pre-diabetes, also called impaired fasting glucose (IFG), increases the risk of developing type 2 diabetes, heart disease, and stroke. People with IFG will likely develop type 2 diabetes within 10 years if lifestyle changes are not made.
- Fortunately, IFG can be reversed, preventing or delaying the onset of type 2 diabetes.

Type 2 Diabetes

- Type 2 diabetes is present when fasting blood glucose levels consistently exceed 126 mg/dL following an overnight fast.
- The incidence of type 2 diabetes is increasing in epidemic proportions, especially in the U.S., making it one of the leading causes of death and disability.
- Type 2 diabetes is a chronic, lifelong disease with long-term complications that can affect almost every part of the body. Blindness, heart and blood vessel disease, stroke, kidney damage and failure, nerve damage, and amputations are common complications of type 2 diabetes that can develop over time, especially when blood glucose levels are poorly managed.

Type 2 Diabetes Symptoms

- Many people with type 2 diabetes have no symptoms and are unaware they have the disease.
- If you experience any combination of the symptoms below, contact your healthcare provider without delay.

Possible Type 2 Diabetes Symptoms		
Blurred vision	Increased thirst	Recurrent skin or gum infections
Extreme fatigue	Increased urination	Slow healing
Extreme hunger	Irritability	Tingling/numb hands and/or feet
Frequent infections	Recurrent bladder infections	Unexplained weight loss

- Some people have a greater risk of developing IFG and type 2 diabetes than others. Non-modifiable risk factors include age over 45 years, male gender, family history, race (African descent, Asian descent, American Indian, and Hispanic descent), history of gestational diabetes, and polycystic ovary syndrome.
- Lifestyle modification can reverse IFG and prevent or delay the onset of type 2 diabetes. The following risk factors can be controlled: excess body weight (especially in the abdomen), BMI>30, high blood pressure, high triglycerides, inactivity, and low HDL cholesterol.

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Managing Blood Glucose Levels and Lowering Diabetes Risk

Tips for Managing Blood Glucose	
Lose Weight	Losing 5-7% of your body weight can lower your risk of developing diabetes. Fat produces hormones that affect appetite and insulin action. Excess body fat disrupts the normal balance of these hormones, which can contribute to insulin resistance. Following the suggestions listed below will likely result in weight loss.
Exercise	Exercise aids in weight loss, improves insulin sensitivity, and normalizes blood glucose. If you are currently sedentary, start slowly and build up to exercising 30 minutes per day, 5 days per week. An activity as simple as brisk walking provides health benefits. Discuss new exercise regimens with your doctor.
Dietary Modifications	• Learn about the glycemic index (GI). A food's GI indicates how long it takes the body to turn a food's carbohydrates (carbs) into glucose. The faster a food is converted to glucose, the quicker it raises your blood sugar and the higher its GI. Foods with a high GI raise blood sugar and cause your body to store calories as fat. Choose foods with a low GI or pair a high GI food with a low-index food. • Limit carbs to 50% or less of your total daily caloric intake. Choose complex carbs (whole grains, oats, brown rice, etc.) over "white" or simple, highly processed carbs (white flour, white rice, pasta made with white flour, crackers, sweets, sugary drinks, etc.) • Increase fiber consumption by eating legumes (like cooked dried beans), whole grains, fruits, and vegetables. Fiber takes longer to digest, which makes you feel full longer, and high-fiber foods have a lower glycemic index. • Limit your intake of red meats and animal fats. • 30% of your daily calories should come from fat. Choose healthy fats (olives & olive oil, avocados & avocado oil, nuts & nut butters etc.). Avoid saturated fats and trans fats. • Avoid processed foods. Many "convenience" foods are processed. They are high in simple carbohydrates, sodium, trans fats, sugar, and saturated fats. • Switch from regular soda or juice to water and unsweetened (not diet) beverages. • Eat smaller portions. Using smaller plates helps with portion control. • Learn to read food labels. • Rather than eating three large meals, try eating smaller meals throughout the day to keep your blood sugar on an even keel. Always include a high quality source of protein.
Quit Smoking	Smokers are 30-40% more likely to develop type 2 diabetes than nonsmokers.
Limit Alcohol	Limit alcoholic beverages to one drink per day for women and two per day for men.
Sleep Hygiene	Inadequate sleep can cause an imbalance in hormones that affect appetite and fat production. This can cause cravings for sugar and carbohydrates, leading to binges and snacking. Inadequate sleep also makes it harder for your body to use insulin effectively. People who sleep less than six hours per night are more likely to develop pre-diabetes.
Manage Stress	Stress triggers a "fight-or-flight" response, in which glucose is released for quick energy. High stress levels mean higher blood glucose.
Natural Remedies, Herbs, Minerals, and Supplements	Speak with a doctor or pharmacist before trying a natural remedy. • Apple cider vinegar: 1-2 tablespoons in water, with or before meals, 3 times per day. • Cinnamon: 1 gram daily • Alpha-lipoic acid (ALA) • Green tea • Other herbs, minerals, and supplements that may assist in lowering or regulating blood sugar include: selenium, vanadium, magnesium, zinc, clove, bay leaf, garlic, aloe vera, prickly pear cactus, ginseng, CoQ10, gymnema, gurmar, (gymnema and gurmar are the same thing; gurmar is the Hindi translation) and bitter melon.

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Metabolic Syndrome

What is Metabolic Syndrome?[1,2,3,4]

- Metabolic syndrome refers to the presence of risk factors for both diabetes and cardiovascular disease. It occurs when a combination of the following traits, or treated conditions, are present at one time:
    - Increased waist circumference
    - Elevated triglycerides
    - Low HDL cholesterol
    - Elevated blood pressure
    - Elevated blood glucose
- Metabolic syndrome is believed to be associated with insulin resistance. Insulin resistance is a condition in which the body is unable to use insulin properly, resulting in higher levels of blood glucose.
- Metabolic syndrome significantly increases your risk for developing heart disease, stroke, and diabetes.
- Genetics and older age are additional factors that may play a role in causing metabolic syndrome.
- Metabolic syndrome has also been associated with fatty liver disease, kidney disease, gout, and sleep disorders.
- Most of the traits that make up metabolic syndrome can be addressed through lifestyle modification.

Reducing Risks: Exercise and Physical Activity[1,4]

- Thirty minutes or more of aerobic exercise five or more days per week can result in weight loss, improved blood pressure, improved cholesterol levels, and a reduced risk of developing diabetes.
- Try any activity that raises your heart rate, including walking, jogging, cycling, hiking, or swimming.
- Exercise may reduce the risk for heart disease, even without any accompanying weight loss.
- Remember to discuss physical activity with your healthcare provider before starting a new exercise regimen.

Reducing Risks: Additional Lifestyle Modifications[1,4]

- Lose weight. Moderate weight loss (5-10% of body weight) can reduce the chance that metabolic syndrome will evolve into a more serious illness, like diabetes.
- Avoid tobacco in any form. If you are a smoker, quit. Also avoid secondhand smoke. Smoking cessation will improve your cholesterol levels and lower your blood pressure.

Reducing Risks: Dietary Considerations[4]

- Learn about the glycemic index. A food's glycemic index indicates how long it takes the body to turn a food's carbohydrates into glucose. The faster a food is converted to glucose, the quicker it raises your blood sugar and the higher its glycemic index. Foods with a high glycemic index cause large spikes in blood sugar and cause your body to store calories as fat. Choose foods with a with a low glycemic index.
- Limit carbohydrates (carbs) to no more than 50 percent of your total daily caloric intake. Choose complex carbs (whole grain bread, oats, brown rice, etc.) over "white" or simple carbs (white flour, white rice, pasta made with white flour, refined sugars, sugar-sweetened beverages, etc.). Simple carbs have a higher glycemic index.
- Increase fiber consumption by eating legumes (like cooked dried beans), whole grains, fruits, and vegetables. Fiber takes longer to digest, which makes you feel full longer, and high-fiber foods have a lower glycemic index.

Reducing Risks: Dietary Considerations, Continued[4]

- Limit your intake of red meats and animal fats.
- About 30% of your daily calories should come from healthy fats, including olives and olive oil, avocados, nuts and nut butters, seeds, and fatty fish like salmon and tuna.
- Avoid processed foods. Many “convenience” foods and fast foods fall into this category. They tend to be high in simple carbohydrates, sodium, trans fats, and saturated fats.
- Limit alcohol consumption. Men over 65 and women of all ages should limit their intake to no more than 1 drink per day. Men under 65 should limit their intake to 2 drinks per day.
- Limit or avoid soft drinks and sugar-sweetened beverages.

Take Home Points

- If a first-degree family member has a history of metabolic syndrome, your risk of developing metabolic syndrome is increased. Implementing lifestyle modifications is critical to reduce your risk of diabetes or cardiovascular disease.
- Patients with metabolic syndrome should immediately begin weight reduction and physical activity to reduce the risks of developing diabetes or cardiovascular disease.
- Therapy for metabolic syndrome includes treating underlying causes with diet modifications and physical activity. When dietary changes and increased physical activity are ineffective, medications should be initiated and taken exactly as prescribed.

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