

Chapter 14: Preventing Diabetes Problems (Complications)

Over time, diabetes-related risk factors such as high blood glucose, high blood fats and high blood pressure can damage your blood vessels. This damage can lead to long-term (chronic) problems (complications) that can affect your heart, kidneys and eyes. These problems can also affect body systems such as the nervous system.

To prevent or delay long-term problems of diabetes:

- Keep your blood glucose and blood pressure in your target range.
- Live a healthy, balanced lifestyle.
- Get regular checkups with your health care provider.

Large Blood Vessel Disease

Large blood vessels help move blood to your heart, brain and legs. These blood vessels can be damaged by:

- **high blood glucose and high blood pressure.**
These can reduce blood flow to the heart, brain and legs.
- **high blood fats (cholesterol and triglycerides).**
These can cause hardening of the arteries (atherosclerosis), which decreases blood flow.

People with diabetes are at an increased risk for heart attacks, strokes and decreased blood flow to the legs (called peripheral artery disease).

Signs of large blood vessel disease include:

- slow healing of sores on legs and feet
- cold feet
- loss of hair on feet
- red feet when they dangle
- leg pain that comes with activity and goes away with rest (called intermittent claudication)
- chest pain (called angina).

Small Blood Vessel Disease

Small blood vessel disease in the eyes and kidneys can happen more often in people with diabetes. Small blood vessel disease can also damage nerves.

Eyes (retinopathy)

High blood glucose and high blood pressure can change blood vessels in the back of your eye (retina). New weak blood vessels form which can leak or bleed heavily (hemorrhage). The bleeding can reduce eyesight or cause a total loss of vision.

Regular visits to an eye doctor (ophthalmologist) can help save your sight. Early signs of eye problems connected with diabetes can be detected at these visits. Laser treatments are used for retinopathy.

During your yearly eye checkups, your eye doctor will check for cataracts (clouding of the lens) and glaucoma (increased pressure in the eye). These problems happen more often in people with diabetes.

Signs of eye problems include:

- flashes of light
- floating black spots
- double or blurred vision
- pain or similar signs.

Call your eye doctor or health care provider right away if you have any of these signs. Many people with diabetes do not have any early signs of eye problems.

To prevent eye problems:

- Keep your blood glucose and blood pressure in your target range.
- Do not use tobacco.
- See an eye doctor yearly (more often if needed).
- Avoid weight lifting if you have proliferative retinopathy (a condition that causes bleeding, cloudy vision and damage of the retina).

allinahealth.org/diabetes

Kidneys (nephropathy)

High blood glucose and high blood pressure can damage a kidney's small blood vessels.

Your kidneys are your body's filters, removing dangerous toxins and wastes from your blood. In some people with diabetes, high blood glucose levels seem to cause the kidneys to work harder than needed to keep waste levels low.

This overwork appears to cause too much wear and tear on the kidneys. Over time, they can no longer do their job. Small kidney blood vessels called glomeruli get damaged and begin to leak. This damage can get worse until the kidneys fail.

High blood pressure, common in people with diabetes, also puts stress on kidneys. Your health care provider will keep a close watch on your blood pressure for this reason.

An early sign of kidney damage is having small amounts of protein in your urine (microalbuminuria). Routine urine and blood tests can alert your health care provider to developing kidney problems.

Controlling your blood pressure and keeping your blood glucose in your target range will help delay or slow the onset of diabetic kidney disease. If kidney failure occurs, dialysis or a kidney transplant is a treatment option.

Signs of kidney damage include:

- protein in the urine: may indicate infection or nephropathy.

There are no signs of kidney damage in the early stages.

Important

Call your health care provider if you have any of the signs of sensory, motor or autonomic neuropathy.

To prevent kidney damage:

- Keep your blood pressure and blood glucose in your target range.
- Do not use tobacco.
- Do not take medicines that could harm your kidneys. Talk with your health care provider about your medicines.
- Contact your health care provider right away if you have any signs of a kidney or bladder infection. Signs include: low back pain, fever, frequent urination, burning sensation while urinating or blood in the urine.

Nerves (neuropathy)

Small blood vessel disease and a buildup of sorbitol (a byproduct of high blood glucose) in the nerves can damage nerves in various parts of your body:

- **Peripheral neuropathy:** damage to nerves in your arms and legs. This could be in the form of sensory neuropathy or motor neuropathy.

Sensory neuropathy signs include:

- numbness
- tingling or burning feelings, or both
- pain in the arms or legs.

Motor neuropathy signs include:

- loss of balance
- loss of muscle mass
- foot deformities.

- **Autonomic neuropathy:** damage to nerves that control automatic body processes such as heartbeat, blood pressure, digestion, urination and sexual function.

Autonomic neuropathy signs include:

- sexual dysfunction (impotence in men, decreased vaginal lubrication and arousal disorder in women)
- silent heart attack (heart attack with no chest pain)
- excessive sweating or dry skin
- food digestion process that is slow and not predictable
- constipation alternating with diarrhea
- bladder problems
- lack of low blood glucose symptoms
- a sudden drop in blood pressure when you stand that makes you feel faint or dizzy.

To prevent nerve damage:

- Keep your blood glucose and blood pressure in your target range.
- Do not use tobacco.

Treatment for neuropathy depends on the type of neuropathy. There are many medicines available.

Long-term problems do not occur in all people with diabetes. You can prevent them from developing or catch them early while they are treatable. See your health care provider on a regular basis and follow your diabetes self-management plan.

Keeping Your Heart Healthy When You Have Diabetes

Glucose goals

As someone with diabetes, you know how important it is to reach your blood glucose goal. Good glucose control can help you avoid problems with your heart, blood vessels, eyes, kidneys and nerves. But blood glucose control alone is not enough to keep you safe from problems.

Blood pressure and cholesterol goals

Diabetes is a risk factor for cardiovascular disease (CVD), the leading cause of early death among people with diabetes. CVD refers to a diseased heart (cardio) and diseased blood vessels (vascular). CVD can cause heart disease, stroke, vision loss, kidney failure and nerve damage.

Two conditions that can lead to CVD are high blood pressure and high levels of low-density lipids (LDL or “bad” cholesterol).

Understanding blood pressure and cholesterol and reaching recommended goals can help prevent CVD and reward you with a healthier heart.

Blood pressure basics

Blood pressure is pressure on the walls of your blood vessels as your heart pumps blood through your body.

If your blood vessels become clogged and narrowed, your blood pressure will increase. It may also increase if you are overweight, have kidney problems or drink too much alcohol. High blood pressure can run in families.

High blood pressure can lead to heart attack or stroke, eye problems and more severe kidney problems.

Blood pressure is written as two numbers separated by a slash, such as 130/80. This is often called a blood pressure reading.

- The top number shows the maximum pressure on your arteries when your heart contracts and forces blood through your body.
- The bottom number shows the minimum pressure on your arteries when your heart relaxes and refills with blood.

Blood pressure goal

Allina Health recommends a blood pressure of 139/89 or less.

What can help control blood pressure?

If your blood pressure is high, your health care provider may ask you to take a medicine called an ACE inhibitor. This type of blood pressure medicine is best for people with diabetes. In addition to lowering your blood pressure, it may help keep your kidneys healthy. Your health care provider may also suggest you:

- lose weight
- eat more fruits and vegetables
- reduce the amount of salt you eat
- drink less alcohol
- get regular physical activity.

It is important that you get your blood pressure checked each time you visit your health care provider.

Cholesterol basics

Cholesterol is a fat-like substance in your blood. Your body makes some cholesterol to help it function properly. You may also get cholesterol from some of the foods you eat and you may inherit a tendency toward high cholesterol.

When your blood cholesterol level is too high, the cholesterol builds up on the walls of your arteries. Over time, this can:

- **block the flow of blood to your heart, depriving it of oxygen** (A partial blockage may result in chest pain. A total blockage will cause a heart attack.)
- **block the flow of blood to your brain, depriving it of oxygen.** (A total blockage will cause a stroke.)

Cholesterol goals

The American Heart Association and American College of Cardiology recommend taking a statin medicine to protect your arteries and reduce your risk of heart disease.

What can help control cholesterol?

You can help control your cholesterol level in the following ways:

- Eat foods low in saturated fat, trans fat and cholesterol. This includes:
 - vegetables and fruits
 - whole grains
 - fat-free or low-fat dairy foods and beverages
 - lean protein such as chicken breast, turkey breast, fish, legumes (beans, lentils, peas) and soy
 - healthful oils (olive oil, avocado oil) and nuts.

Limit sweets, sugar-sweetened beverages and red meats. Limit or avoid eating “tropical” oils such as coconut, palm kernel and palm oils.

- Lose weight if you are overweight. This can lower your LDL level and raise your HDL level.

- Be physically active 3 to 4 times each week for a total of at least 150 minutes. This can also lower your LDL level and raise your HDL level.
- Take any medicine to lower your cholesterol as prescribed. Eating more healthful foods and increasing your activity level are often not enough to reach your cholesterol goals.

You may have a high cholesterol level and not yet have any signs of disease. Your health care provider will recommend how often to have your cholesterol level checked.

Low dose of aspirin

Research shows that if you have diabetes and have heart disease or have had a stroke, taking a low dose of aspirin every day may reduce your risk of more problems.

Aspirin helps prevent blood clots that can block the flow of blood and lead to a heart attack or stroke. But taking aspirin is not safe for everyone, so it is important to talk with your health care provider before you start taking aspirin every day.

Important: Taking aspirin with blood thinners may increase your risk for bleeding.

Tobacco and Diabetes Problems (Complications)

Did You Know

Tobacco products include cigarettes, electronic nicotine delivery systems (ENDS, includes e-cigarettes), cigars, smokeless tobacco (dip or chew), hookahs, pipes, roll-your-own, and oral nicotine products.

Did You Know

Smokeless tobacco contains *a lot* of sugar. This can make it harder to control your glucose levels.

Using tobacco makes diabetes harder to control. People who do not use tobacco use less insulin and other medicine to keep diabetes under control.

How tobacco affects you

Tobacco:

- damages and narrows blood vessels
 - This can lead to infections and amputations.
- increases insulin resistance
 - This can raise your blood glucose.
- increases blood pressure
 - This can lead to stroke or heart disease.
- makes your blood vessels and arteries “sticky,” which can block blood flow
 - This raises your risks for heart disease, kidney disease, retinopathy (eye disease that causes blindness) and nerve damage (peripheral neuropathy).

E-cigarettes: what you need to know

- E-cigarettes are known by many names such as e-cigarettes, e-cigs, vapes and electronic nicotine delivery systems (ENDS).
- These products use an “e-liquid” found in pre-filled or refillable cartridges, disposables or pods.
- The liquid is heated to create an aerosol that the user breathes in. The heat can turn some of the chemicals into known cancer-causing chemicals.
- Private and federally-funded tests found many of the same chemicals in ENDS products that make cigarettes so dangerous.
 - benzene (found in car exhaust)
 - heavy metals (nickels, tin, lead)

- arsenic (found in rat poison)
- formaldehyde (used to preserve dead tissue)
- glycerin and glycol (used in antifreeze).

Testing has also found chemicals known to cause cancer in humans and scarring in the lungs.

- E-cigarettes are not safe. E-cigarettes are a tobacco product.
- The U.S. Food and Drug Administration (FDA) is starting to regulate ENDS products. This is a slow process.

The FDA has not approved e-cigarettes as a way to quit smoking.

Benefits of quitting

- Your body responds quickly to quitting:
 - **8 hours:** The carbon monoxide level in your blood drops to normal. The oxygen level in your blood increases to normal.
 - **24 hours:** Your chance of heart attack decreases.
 - **48 hours:** Nerve endings start to grow again.
 - **2 weeks:** Circulation to your hands and feet improve. Your ability to exercise improves.

(Source: World Health Organization)
- There are many health benefits to quitting. Quitting:
 - lowers your chances of stroke, heart disease, insulin-resistance and nerve damage
 - gives you better glucose control
 - lowers your risks of many types of cancers.

Not Ready to Quit? Consider Taking a Break!

If quitting tobacco seems like too much right now, consider taking a break or a vacation from tobacco use.

This can help you get your blood glucose under control by restoring balance*.

- Set a goal to stop using tobacco.
- Talk with your health care provider for resources or ways to cope with withdrawal symptoms.

If this goes well, maybe you will take more breaks during the year. This could lead to a tobacco-free life!

***Keep taking your medicine.**

Suggestions for quitting tobacco

Studies show that the most successful way to quit uses counseling, medicines and follow-up. Ask your health care provider for more information.

- Prepare to stop.
 - Get support from family and friends.
 - Avoid places where you know you will want to use tobacco.
 - Plan activities to replace using tobacco.
- Choose a day to stop.
 - Get rid of tobacco products, ashtrays and lighters.
- Stop.
 - Stop on the day you planned to stop.
 - Be careful with situations or activities in which you might be tempted to start using tobacco again.
 - Try to keep your focus on today, not the future. Tell yourself, “I am not smoking today.”
- Stay stopped.
 - Think positive thoughts. Remember why you decided to stop. Reward yourself.
 - Remember that your craving will pass whether you use tobacco or not.
 - Do not play games like telling yourself, “One cigarette won’t hurt,” “I deserve a dip,” “I just want to see how a cigarette tastes.” Your brain might tell you these things to persuade you to go back to tobacco..



Product-specific Resources

- financial aid Nicotrol® inhaler
— 1-844-989-PATH (7284)
— pfizerrxpathways.com
- Plant Extracts aromatherapy
— 1-877-999-4236
— plantextractsinc.com

Resources for quitting

Allina Health (for your hospital stay)

- Tobacco Intervention Program at Abbott Northwestern Hospital
— 612-863-1648
- Tobacco Intervention Program at Mercy Hospital
— 763-236-8008
- Tobacco Intervention Program at River Falls Area Hospital
— 715-307-6075
- Tobacco Intervention Services at Allina Health United Hospital – Hastings Regina Campus
— 715-307-6075
- *United Hospital Lung and Sleep Clinic Tobacco Cessation Program
— 651-726-6200
- *Penny George™ Institute for Health and Healing (LiveWell Center) tobacco intervention coaching
— 612-863-5178

Other

- Quit Partner
— 1-800-QUIT-NOW (1-800-784-8669) or quitpartnermn.com
— American Indian: 1-833-9AI-QUIT or aiquit.com
— Spanish: 1-855-DEJELO-YA (1-855-335-3569) or quitpartnermn.com/es
— asiansmokersquitline.org
- online tobacco cessation support
— smokefree.gov
- American Lung Association/Tobacco Quit Line
— 651-227-8014 or 1-800-586-4872
- *Mayo Clinic Nicotine Dependence Center's Residential Treatment Program
— 1-800-344-5984 or 1-507-266-1930

*There may be a cost to you. Check with your insurance provider.

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