

Chapter Organization - Complications

1. Welcome

2. Summary of 2018 CPG on Foot Care and Weight Management

3. Teaching Tools

- a. Foot Examination Tool**
- b. Daily Foot Care Checklist**
- c. Weight Management Program Checklist**
- d. Nerve Damage Teaching Tool**
- e. Kidney Complications Teaching Tool**

4. Hand outs

- a. A Step Towards Good Health (Foot care)**
- b. SGLT2 Inhibitors**
- c. ABCDESSS of Staying Healthy with Diabetes**
- d. Your eyes and diabetes**
- e. High Blood Pressure and Diabetes**
- f. Cholesterol and Diabetes**
- g. Heart Disease and Stroke Prevention**
- h. Smoking and Diabetes**
- i. Risk of Dehydration and Diabetes**



**When obstacles arise, change your
direction to meet your goal!**





Foot Care

2018 Clinical Practice Guidelines

Summary

Key Messages for people with

Diabetes:

- Nerve damage and poor blood flow to the legs and feet can be caused by diabetes
- Diabetes can make small injuries more difficult to heal – for example a blister or small cut may take a long time to heal & may become infected
- It is important to look over your feet once a day when living with diabetes
 - Look over your legs & feet each day
 - Clip toenails regularly
 - If your feet are dry apply lotion, but not between the toes
 - Wear comfortable shoes that fit feet properly
 - When taking a bath touch the water with your hands first – your feet may not be sensitive to the heat & you wouldn't want to burn your skin
- If you have thick dry skin on your toes or on the bottoms of your feet have these checked by a doctor or foot care nurse
- See a health care provider right away if feet or legs are swelling, red, warm, or in pain

More information

People living with diabetes have an increased risk for developing foot ulcers – these could lead to infection & possible amputation if not treated

- People living with diabetes are 20 times more likely to need a lower limb amputation compared to other adults
- Prevention, foot care education, and early treatment of foot problems are important parts of caring for diabetes.

Risk Assessment

A common foot ulcer classification system used is called the Wagner system.

- Wagner grade 0 = foot skin intact
- Wagner grade 1 = superficial ulcer
- Wagner grade 2 = ulcer extending to tendon, capsule, or bone
- Wagner grade 3 = deep ulcer with abscess
- Wagner grade 4 = gangrene of toes or forefoot (gangrene is a serious bacterial infection)
- Wagner grade 5 = gangrene of midfoot or back of foot

Foot examination is an important part of preventing serious foot conditions and limiting the risk of needing to amputate. Footwear (shoes, sandals, boots, moccasins) should be checked for

proper fit to make sure no circulation is lost. Be sure to also check the temperature of your feet – increased temperature could be a sign that feet need to be taken to see a health care professional.

Prevention Care & Treatment

Prevention of serious foot ulcers and amputation means checking your feet regularly, getting them examined by a professional (doctor or foot care nurse) regularly, taking care of calluses, learning about the signs of poor foot health, finding ulcers early, and having properly fitting footwear. If possible, professionally fitted footwear is recommended to help reduce foot pressure.

Foot ulcer treatments should ideally be done by an interprofessional team. Improving blood sugar control, decreasing pressure, infection treatments, wound care, and checks for proper blood flow in legs and feet are all important parts of foot care & treatment.

Poor blood sugar control may increase risks of foot problems and need for amputation therefore good glycemic control is a good way to protect your feet.

Infections can get worse very quickly when living with diabetes. If a foot sore or ulcer becomes infected it is important to seek medical attention right away.

Recommendations

1. At least once every year people living with diabetes should have a health care provider perform a foot examination. This exam should be looking for changes in foot shape, bony abnormalities, abnormal range of motion in ankles and toes, skin changes (ulcers, infections, calluses), and increased foot temperature or pulse.
2. People living with diabetes should receive foot care education and counselling to avoid foot trauma and possible amputation.
3. People with diabetes who develop a foot ulcer or infection should seek medical attention right away – even if feeling no pain.

Nerve Damage (Diabetic Peripheral Neuropathy)

Teaching Tool

Diabetic peripheral neuropathy is a long-term complication of diabetes. Exposure to high blood glucose (sugar) levels over an extended period of time causes damage to the peripheral nerves – the nerves that go to the arms, hands, legs, and feet.

Symptoms of diabetic peripheral neuropathy

Although diabetic peripheral neuropathy can occur in many places in the body, the most common symptoms are abnormal sensations in the toes and feet, including:

- Sharp, shooting pains
- Burning
- Tingling
- A feeling of being pricked with pins
- Throbbing
- Numbness (not able to properly feel pain, heat, or cold)

Diabetic peripheral neuropathy increases the risk for foot ulcers and amputation. Due to nerve damage in their feet and toes, people with diabetes who have diabetic peripheral neuropathy often do not notice minor cuts, sores, or blisters in these areas. If left untreated, these small wounds can easily become infected, lead to gangrene, and may eventually require amputation of the affected area.

Risk factors for diabetic peripheral neuropathy

Risk factors for diabetic peripheral neuropathy include:

- High blood sugar levels
- Elevated triglycerides
- Excess body weight
- Smoking
- High blood pressure

Diagnosing diabetic peripheral neuropathy in the feet

Your doctor or foot-care specialist can test for diabetic peripheral neuropathy by lightly pressing a thin nylon rod (10-gram monofilament) to different areas of your foot (in particular, your big toe) or by using the 128-Hz tuning fork on the back of the big toe to determine if you can feel it. These are easy and pain-free tests.

When to screen for diabetic peripheral neuropathy

For type 1 diabetes

- Because diabetic peripheral neuropathy is uncommon within the first five years after onset of type 1 diabetes, annual screening for diabetic peripheral neuropathy should begin after five years of diabetes diagnosis.
- For children with type 1 diabetes, screening should be done once the child is past puberty and has had diabetes for at least five years.

For type 2 diabetes

- For people with type 2 diabetes, screening for diabetic peripheral neuropathy should begin right away, at diagnosis of diabetes, and every year after that.

How can I prevent complications of diabetic peripheral neuropathy?

Although there is no cure, there are many ways you can effectively manage diabetic peripheral neuropathy.

Proper foot care

- Examine your feet and legs daily.
- Care for you nails regularly.
- Apply lotion if your feet are dry (but not between the toes).
- Wear properly fitting footwear.
- Test your bath water before you step in to make sure it's not too hot.
- Do not soak your feet.

Excellent blood sugar control

- Managing your blood sugar levels effectively can help to prevent further nerve damage.

Medications

- Some medications that act on the nerves, can be helpful.
- Ask your doctor what would be best for you diabetes.

Hand out: A Step towards Good Health

Foot problems are very common in people with diabetes and can lead to serious complications.

This section provides basic information about how diabetes affects your feet and what you can do to keep your feet healthy.

Diabetes & your feet

Diabetes can cause nerve damage (also known as diabetes peripheral neuropathy) and poor blood flow or circulation to the legs and feet (also known as peripheral arterial disease). As a result, people with diabetes are less likely to feel a foot injury, such as a blister or cut. Diabetes can make these injuries more difficult to heal. Unnoticed and untreated, even small foot injuries can quickly become infected, potentially leading to serious complications.

Best advice

Do:

- Wear well-fitting shoes. They should be supportive, have low heels (less than five centimeters high) and should not rub or pinch. Shop at a reputable store with knowledgeable staff who can professionally fit your shoes.
- Buy shoes in the late afternoon (since your feet swell slightly by then).
- Wear socks at night if your feet get cold.
- Elevate your feet when you are sitting.
- Wiggle your toes and move your ankles around for a few minutes several times a day to improve blood flow in your feet and legs.
- Exercise regularly to improve circulation
- Inspect your feet daily and in particular, feel for skin temperature differences between your feet.

Don't:

- Use over-the-counter medications to treat corns and warts. They are dangerous for people with diabetes
- Wear anything tight around your legs, such as tight socks or knee-highs.
- Ever go barefoot, even indoors. Consider buying a pair of well-fitting shoes that are just for indoors
- Put hot water bottles or heating pads on your feet.
- Sit or cross your legs for long periods of time.

- **Smoke.** Smoking decreases circulation and healing, and significantly increases the risks of amputation.
- **Wear over-the-counter insoles** - they can cause blisters if they are not right for your feet.

Your health-care team

Make the most out of your visit with your health-care professional by asking these three questions:

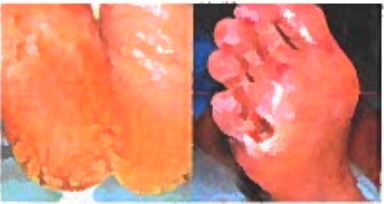
1. What is my main problem?
2. What do I need to do?
3. Why is it important for me to do this?

Members of your foot-care team can include:

- **Chiropodists or Podiatrists:** people who specialize in treating foot diseases, disorders and dysfunctions
- **Diabetes Educators:** people who can educate others on diabetes, including foot care
- **Doctors:** can assist in diabetes management, and some have specialized training in foot care
- **Nurses:** some have specialized training in foot care (specifically foot care nurses)
- **Orthotists/Prosthetists:** people who specialize in orthotic and prosthetic devices. An orthotic device is a special piece of equipment like a foot support or ankle brace that helps correct bone growth that has moved out of line, or to a position that is uncomfortable. The device would help support and straighten the limb or foot. A prosthetic is a device that is used to replace a part of the body for example a prosthetic leg for someone who needed a foot amputation.
- **Pedorthists:** specialize in orthotics (footwear supports), footwear and footwear modifications

Foot Examination Tool

Know the signs



Are your feet...

- Numb, painful or tingling?
- Do your feet feel like blocks of wood?
- Changing shape?
- Is one foot different than the other?
- Any change is important.
- Dry, callused or cracked?
- Do they have sores or blisters?

What can you do?

- Control your blood glucose (sugar) levels.
- Have a health-care professional trim your toenails and care for the skin on your feet.
- Have your shoes professionally fitted.
- Avoid too much walking.
- Visit your health-care professional as soon as possible.
- Have your shoes professionally fitted.
- Changes to your skin should be seen by a health-care professional.
- Wash a sore or blister with warm water; dry well, and cover with a bandage. See a health-care professional today.
- Avoid walking on your foot as it heals.



Daily foot care checklist

As always, prevention is the best medicine. A good daily foot-care routine and good blood sugar control will help keep your feet healthy.

Start by putting together a foot-care kit containing nail clippers, nail file, lotion, and a non-breakable hand mirror. Having everything you need in one place makes it easier to follow this foot-care routine every day:

1. Wash your feet in warm (not hot) water, using a mild soap. Don't soak your feet, as this can dry your skin.
2. Dry your feet carefully, especially between your toes.
3. Thoroughly check your feet and between your toes to make sure there are no cuts, cracks, ingrown toenails, blisters, etc. Use a hand mirror to see the bottom of your feet, or ask someone else to check them for you.
4. Clean cuts or scratches with mild soap and water, and cover with a dry dressing suitable for sensitive skin.
5. Trim your toenails straight across and file any sharp edges. Don't cut the nails too short.
6. Apply a good lotion to your heels and soles. Wipe off excess lotion that is not absorbed. Don't put lotion between your toes, as the excessive moisture can promote infection.
7. Wear fresh clean socks and well-fitting shoes every day. Whenever possible, wear white socks – if you have a cut or sore, the drainage will be easy to see.



Diabetes and foot care:

A patient's checklist



Many people with diabetes have problems with their feet. You can prevent serious problems by following these basic guidelines. Ask your doctor to explain your risk factors for foot problems.

DO...	DON'T...
<ul style="list-style-type: none"> check your feet every day for cuts, cracks, bruises, blisters, sores, infections or unusual markings 	<ul style="list-style-type: none"> cut your own corns or calluses
<ul style="list-style-type: none"> use a mirror to see the bottom of your feet if you can't lift them up 	<ul style="list-style-type: none"> treat your own in-growing toenails or slivers with a razor or scissors. See your doctor or foot care specialist
<ul style="list-style-type: none"> check the colour of your legs and feet; if there is swelling, warmth or redness, or if you have pain, see your doctor or foot care specialist right away 	<ul style="list-style-type: none"> use over-the-counter medications to treat corns or warts. They are dangerous for people with diabetes
<ul style="list-style-type: none"> clean a cut or scratch with a mild soap and water and cover with a dry dressing for sensitive skin 	<ul style="list-style-type: none"> apply heat to your feet with a hot water bottle or electric blanket. You could burn your feet without realizing it
<ul style="list-style-type: none"> trim your nails straight across 	<ul style="list-style-type: none"> soak your feet
<ul style="list-style-type: none"> wash and dry your feet every day, especially between the toes 	<ul style="list-style-type: none"> take very hot baths
<ul style="list-style-type: none"> apply a good skin lotion every day on your heels and soles. Wipe off any excess lotion 	<ul style="list-style-type: none"> use lotion between your toes
<ul style="list-style-type: none"> change your socks every day 	<ul style="list-style-type: none"> walk barefoot inside or outside
<ul style="list-style-type: none"> always wear a good supportive shoe 	<ul style="list-style-type: none"> wear tight socks, garters or elastics, or knee highs
<ul style="list-style-type: none"> always wear professionally fitted shoes from a reputable store. Professionally fitted orthotics may help 	<ul style="list-style-type: none"> wear over-the-counter insoles—they can cause blisters if they are not right for your feet
<ul style="list-style-type: none"> choose shoes with low heels (under 5 cm high) 	<ul style="list-style-type: none"> sit for long periods of time
<ul style="list-style-type: none"> buy shoes in the late afternoon (since your feet swell slightly by then) 	<ul style="list-style-type: none"> smoke
<ul style="list-style-type: none"> avoid extreme cold and heat (including the sun) 	
<ul style="list-style-type: none"> exercise regularly 	
<ul style="list-style-type: none"> see a foot care specialist if you need advice or treatment 	

Adapted with permission from: Casella A. Feeling well...diabetes and foot care, a patient's checklist. Knowing Diabetes. © Diabetes Hamilton, 2002.

Across the country, the Canadian Diabetes Association is leading the fight against diabetes by helping people with diabetes live healthy lives while we work to find a cure. Our community-based network of supporters help us provide education and services to people living with diabetes, advocate for our cause, break ground towards a cure and translate research into practical applications.



*This document reflects the 2013 Canadian Diabetes Association Clinical Practice Guidelines.
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Weight Management in Diabetes

**2018 Clinical Practice Guidelines
Summary**

**Key Messages for people with
Diabetes:**

- Having excess weight or obesity increases risks of complications when living with diabetes
- Regular physical activity and eating well can help balance blood sugar control and reduce risks of complications of living with diabetes
- Weight management is an important part of diabetes management, your health care team can help you with this.

More Information

About 80 – 90% of people living with type 2 diabetes also have extra weight or obesity. There are many negative health outcomes

associated with extra weight and obesity in both men and women which often gets worse over time and is difficult to treat. Treatment however with a reduction in weight, to a healthy place, helps blood sugar control and reduces negative health outcomes. The ultimate goal of weight loss in regards to diabetes is to help patients achieve optimal blood sugar control, optimal metabolic control, and to improve overall quality of life while reducing morbidity and mortality.

Healthy Behaviour interventions

Healthy behaviour interventions such as dietary modifications, increased regular physical activity, and behaviour therapy in combination are most effective for successful weight loss. Nutrition plans should be evidence based including a moderate reduction in carbohydrates, appropriate portion sizing, and high nutrient density

Weight Management Program Checklist

When searching for a weight management program to help you lose weight and adopt healthy lifestyle habits ask yourself the following questions:

- Does the program assess and treat comorbid conditions?
- Does the program recommend healthy behaviour modifications?
- Does the program provide individualized nutrition, physical activity, behaviour programs, and counselling?
- Are the weight loss goals claimed realistic? In the range of 1 – 2 kg per month
- Is cost affordable?
- The program does NOT require participants to buy products, supplements, vitamins, or injections?
- There are no unsubstantiated claims (claims that are not supported by evidence)
- Does the program include a weight maintenance program?

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Kidney Complications

Teaching Tool

Kidney disease – known as nephropathy – is a serious complication associated with long-term diabetes. Over the years, high blood glucose (sugar) levels and high blood pressure can damage the kidneys and prevent them from functioning properly or even cause them to fail completely.

Diseases of the kidney are common in people with diabetes. In fact, up to 50% of people with diabetes demonstrate signs of kidney damage in their lifetime, but good diabetes management and regular screening can prevent or delay the loss of kidney function.

What do the kidneys do?

The kidneys are two bean-shaped organs located just below the ribs, near the back. They filter the blood, removing waste through the urine. The kidneys also regulate the amount of fluid and salts in the body and are important in controlling blood pressure.

How does diabetes affect the kidneys?

Diabetes is the leading cause of kidney disease in Canada. Over the long term, high blood sugar levels damage tiny blood vessels in the kidneys, impairing their ability to filter the blood properly. As a result, a type of protein called "albumin" spills into the urine instead of being processed into the blood stream. Tiny amounts of protein in the urine is called microalbuminuria; as kidney disease progresses, more protein is found in the urine, a condition called proteinuria. Without treatment, the kidneys will eventually fail (this is known as "end-stage renal failure") and dialysis or a kidney transplant will be required.

Diabetes can also affect kidneys by damaging the nerves that tell you when your bladder is full. The pressure from a full bladder can damage the kidneys. As well, if urine remains in the bladder for a long time, it can increase your risk of developing a urinary tract infection, which can spread to the bladder.

Screening

Most people don't experience any symptoms in the early stages of kidney disease, so it is important to be screened regularly to detect kidney problems as early as possible.

If you have diabetes, you should have your kidneys checked by having your urine tested for protein. This test is called an ACR (albumin/creatinine ratio) which is a urine test usually done to see if your kidneys have any damage from your diabetes. The target number for most people with diabetes is less than 2.0.

Another test used to check your kidney function is the estimated Glomerular Filtration Rate (eGFR). The eGFR is a test used to see how well the kidneys are working. This test is done in a

lab. A result of less than 60 mL/minute may suggest that you have kidney disease. These tests for your kidneys are usually checked when you are first diagnosed with diabetes, and then once per year after that. If you have kidney disease, you may need to have this test more often.

Prevention & treatment of kidney disease

The development and progression of kidney disease are closely linked to high blood sugar, high blood pressure and smoking. The best way to prevent or delay kidney damage is to:

- Keep your blood sugar at target. Talk to your doctor about what your target range should be.
- Keep your blood pressure at target. For most people with diabetes, the goal is below 130/80. Again, talk to your doctor about your personal target.
- Don't smoke.
- Take your medications as prescribed. Your doctor may prescribe an ACE (angiotensin converting enzyme) inhibitor or an ARB (angiotensin receptor blocker) to help manage your blood pressure and slow the loss of kidney function.
- Have your blood cholesterol checked annually and keep it at target, which is an LDL-cholesterol level of less than 2.0 mmol/L for most individuals.
- Follow a healthy meal plan. If you have protein in your urine, a dietitian may recommend that you reduce the amount of salt and/or protein in your diet.
- Enjoy regular physical activity.

Kidney Health Resources

Kidney Foundation of Canada

- Website: <https://www.kidney.ca/>
- Resources:
 - o Kidneyconnect.ca, an online support group for people living with kidney disease
 - o Patient Handbook
 - o Brochures
 - o Fact sheets

Kidney Health Manitoba Renal Program

- Website:
<http://www.kidneyhealth.ca/wp/>
- Email: kidneyhealth@wrha.mb.ca
- Resources:
 - o Kidney Health Playbook
 - o Kidney quiz
 - o Patient stories

Can-SOLVE CKD Network

- Website: <https://cansolveckd.ca>
- Email: info@cansolveckd.ca
- Resources
 - o Patient Engagement Tools
 - o Patient Stories
 - o Indigenous specific resources



SGLT2 Inhibitors

Type of drug	SGLT2 Inhibitors
How does it work?	Reduces glucose (sugar) levels in your body by increasing the amount of sugar you pass in your urine
Typical names	Canagliflozin (Invokana [®]), Dapagliflozin (Forxiga [™]), Empagliflozin (Jardiance [™])
Usual doses	<ul style="list-style-type: none"> • Canagliflozin 100 mg may be increased to 300 mg (Your dose may depend on your kidney function) • Dapagliflozin 5 mg may be increased to 10 mg • Empagliflozin 10 mg may be increased to 25 mg
Dosing instructions	Take once a day as directed by your healthcare provider
What if I forget a dose?	<ul style="list-style-type: none"> • Take it as soon as you remember • If more than 12 hours has passed since your missed dose, then skip the missed dose and take the next dose at the regularly prescribed time • Do not double your dose
A1C lowering (↓ = least, ↓↓↓ = most)	↓↓ to ↓↓↓
Effect on weight	↓↓
Risk of low blood sugar (hypoglycemia)	Rare
Medication considerations and/or side effects	<ul style="list-style-type: none"> • May cause yeast infections, urinary tract infections, low blood pressure and slight increase in cholesterol • If you take medication for blood pressure discuss this with your doctor • In rare cases, this medication may cause diabetic ketoacidosis (DKA), which is acid build up in the blood
When to call your doctor	<ul style="list-style-type: none"> • Call if you have signs of DKA, which may include nausea, vomiting, lack of appetite, abdominal pain, excessive thirst, difficulty breathing, confusion, unusual fatigue, or sleepiness
When you are sick	<ul style="list-style-type: none"> • When you are sick, vomiting, have diarrhea, or cannot drink enough fluids, you should stop taking this medication until these symptoms go away
Cost (\$ = lowest, \$\$\$\$ = highest)	\$\$\$



ABCDESSS of staying healthy with diabetes

Ask your health-care team about your:

A **A1C** – target is usually 7% or less

B **Blood pressure control** – aim for less than 130/80 mmHg

C **Cholesterol** – LDL cholesterol should be less than 2.0 mmol/L

D **Drugs** to decrease heart disease risk: Blood pressure pills (ACE inhibitors or ARBs), cholesterol-lowering pills (statins), medications that lower blood sugar with proven heart benefit, or ASA (Aspirin)

E **Exercise** and healthy **Eating** – regular physical activity and following a healthy dietary pattern

S **Self-management** support – setting goals, and identifying barriers that may prevent you from reaching your goals

S **Screening** or monitoring for complications – heart, feet, kidneys, eyes

S **Stop** Smoking





**OPEN YOUR EYES
TO AN EYE EXAM!**



Recognize your diabetes-related risks.
Book an appointment today.

Your Eyes and Diabetes


Canadian Society
Ophthalmological canadienne
Société d'ophtalmologie
LES OPHTHALMOLOGES ET CHIRURGIENS
DU CANADA (O.C.S.A.)




Canadian Société
Ophthalmologique canadienne
Société d'ophtalmologie


cnibt | inca

Canadian Retina Society
Société canadienne de la Rétine



CANADIAN ASSOCIATION OF OPTOMETRISTS
ASSOCIATION CANADIENNE DES OPTOMETRISTES



EYE PHYSICIANS
AND SURGEONS
OF ONTARIO

**DIABETES
CANADA** | **DIABÈTE
CANADA**

otn.



The FOUNDATION
FIGHTING BLINDNESS



1 How can diabetes affect my eyes?

- Diabetes can cause "Diabetic Retinopathy" (DR)
- DR is the most common diabetic eye disease affecting 500,000 Canadians¹
- Having too much sugar in your blood can damage the blood vessels in the retina, leading to DR (see Figure 1)
- The retina is the tissue lining the back of the eye and works like the film in a camera that helps you see
- Changes to your eye with DR can reduce your vision (see Figure 2)
- For more information about DR, go to www.eyecandoit.org

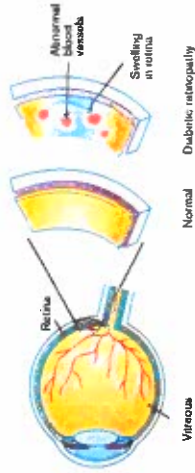


Figure 1. Diabetic retinopathy (DR).

Eye exams are part of managing your diabetes. Early detection and treatment of DR can reduce the risk of blindness by 95 percent.²



Figure 2. Vision with progressing DR. Used with permission from CNIB.³

2 Why should I get an eye exam?

- Diabetes can affect your eyes which can affect your vision over time
- Keeping blood sugar, blood pressure and cholesterol at target may prevent or decrease the risk of DR
- Regular eye exams are very important; sometimes, damage to eyes happens even before the diagnosis of diabetes
- Changes can be detected early by regular eye exams, even before you see any difference in your vision

- Getting regular eye exams is part of your complete diabetes management

3 How do I get an eye exam?

- A diabetic eye exam can be performed by an ophthalmologist or optometrist
- Contact your eye care professional directly for an appointment or have your health care provider refer you for an eye exam

4 What happens during an eye exam?

- Drops are put into your eyes to dilate your pupils (i.e., make them larger)
 - The drops may sting a bit
- Once your eyes are dilated, your eye care provider examines your eyes using a special magnifying lens that provides a clear view of the back of the eye
- Dilated eye exams are a safe and effective part of managing your diabetes
- It is a small commitment of time to help keep your eyesight!

5 Do I have to pay for an eye exam if I have diabetes?

- A diabetic eye exam may be covered by your provincial health plan and available at no cost to you⁴ – you will want to confirm in your province (e.g. the diabetic eye exam is covered in Ontario)

⁴Your eye care provider may offer retinal photos as a permanent record of your exam results at an extra cost

6 How often is an eye exam recommended?

- If your vision changes, you should go see your eye doctor immediately
- If your vision is doing well, you should get an eye exam once a year, unless otherwise directed by your ophthalmologist or optometrist
- Remember, you may not be aware of changes occurring to your vision
- DR can worsen in pregnancy so it is important to get a diabetic eye exam before getting pregnant and while pregnant



People with diabetes should get an eye exam once a year. This is a small investment of time to help keep your eyesight!



A diabetic eye exam may be available at no cost to you.



 You may not be aware of changes occurring to your vision.

7 What if I don't have an ophthalmologist or optometrist?

- Your eyes can be checked for DR through a telemedicine screening program
- A technician takes a photograph of the back of your eye and sends it to an eye doctor to assess whether DR is present and/or whether additional follow-up is required

8 What happens if I have DR?

- Very effective treatments for DR are available and your eye care specialist will explain these to you

9 What can I do to reduce my risk of DR?

- For all patients with diabetes, follow the ABCDES
 - A** A1C – measures blood sugar control and should be 7% or less
 - B** Blood pressure – optimal blood pressure control (less than 130/80 mmHg)
 - C** Cholesterol – LDL-C 2.0 mmol/L or less
 - D** Drugs to protect the heart (even if the baseline blood pressure or LDL-C is already at target)
 - E** Exercise/Eating – Regular physical activity, healthy eating, maintaining a healthy body weight
 - S** Smoking cessation*

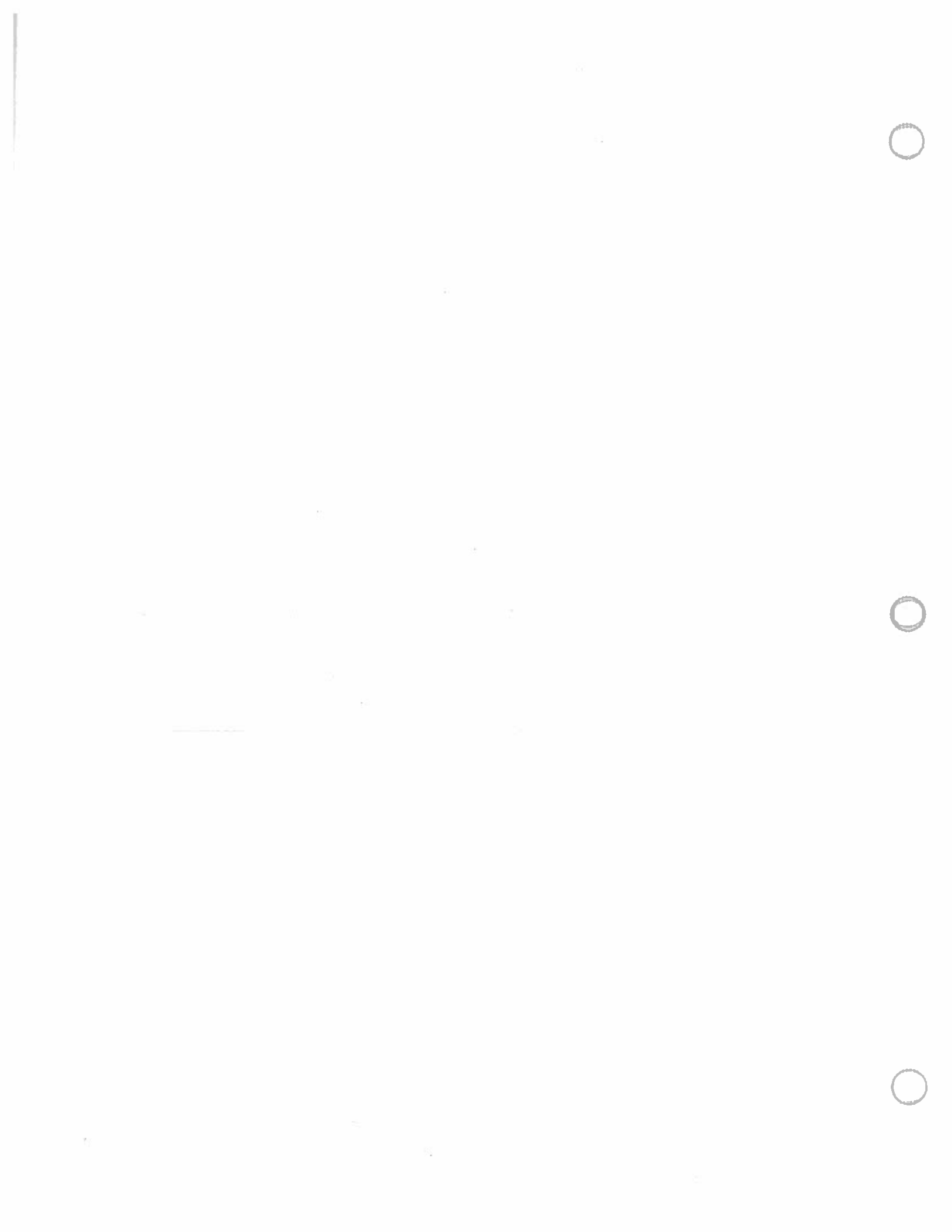
10 Resources

- For more information about DR and diabetes, go to:
 - Canadian Ophthalmological Society:** www.ccos-sco.ca
 - Canadian Association of Optometrists:** www.opto.ca/diabetes
 - CNIB:** www.cnib.ca (check out the vision loss simulator to see what the world would look like with DR!)
 - Angiogenesis Foundation:** www.eyecandot.org
 - Diabetes Canada:** www.diabetes.ca
 - American Academy of Ophthalmology:** www.geteyesmart.org
 - American Academy of Optometry:** www.aaopt.org

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Why is controlling blood pressure important for people with diabetes?

When blood pressure is high, it puts stress on the body. This can cause damage to the heart, brain, kidneys, and eyes. High blood sugar levels are a risk factor for high blood pressure (hypertension). Compared to people without diabetes, people with diabetes are much more likely to develop heart disease and/or experience a stroke at an earlier age.

People with diabetes should have their blood pressure checked every time they visit their health-care team.



What is high blood pressure (hypertension)?

Blood pressure is a measurement of the force of your blood against the blood vessel walls. **The recommended target for people with diabetes is less than 130/80 mm Hg.** The top number is the pressure when your heart contracts and pushes blood out (systolic). The bottom number is the pressure when the heart relaxes between beats (diastolic).

There are often no signs of high blood pressure. This means that you may have high blood pressure and not know it.

Am I doing all that I can to control my blood pressure?

	Yes	No
Do I have my blood pressure checked every time I visit my health-care team?	<input type="checkbox"/>	<input type="checkbox"/>
Am I at a healthy weight?	<input type="checkbox"/>	<input type="checkbox"/>
Do I follow a healthy diet that includes vegetables, fruits, low-fat dairy products, and is low in sodium and saturated and trans fats?	<input type="checkbox"/>	<input type="checkbox"/>
Am I physically active on a regular basis?	<input type="checkbox"/>	<input type="checkbox"/>
Am I a non-smoker?	<input type="checkbox"/>	<input type="checkbox"/>
Do I manage stress in a healthy way?	<input type="checkbox"/>	<input type="checkbox"/>
Do I limit my alcohol intake?	<input type="checkbox"/>	<input type="checkbox"/>
Do I take my medication as prescribed?	<input type="checkbox"/>	<input type="checkbox"/>

Strategies to lower blood pressure

Healthy eating

Healthy eating plays an important role in managing blood pressure. It is important to reduce your salt intake.

Foods naturally contain small amounts of sodium, but most of the sodium in our diet is added during food processing. Canned and packaged foods are often high in sodium because it is added to preserve food. **Reduce your sodium intake toward 2,000 mg per day.** One teaspoon of salt has 2,300 mg of sodium.

Try these healthy eating tips:

- Choose vegetables and fruits more often (fresh or frozen without added salt).
- Choose low-fat (1% or skim) dairy products.
- Choose legumes (dried beans, peas and lentils) more often. Rinse canned beans with water.
- Choose whole grains such as whole wheat breads, cereal, pasta and brown rice.
- Eat fish at least twice a week (fresh, frozen or canned without added salt).
- Choose lean meats and poultry without added salt.
- Limit processed, smoked and cured foods.
- Look for unsalted or 'no added salt' items (e.g. crackers, nuts).
- Avoid using salt at the table and in cooking.
- Avoid seasonings that contain the word 'salt' or 'sodium', such as garlic salt, celery salt, kosher salt, sea salt or monosodium glutamate (MSG).
- Flavour your foods with herbs, spices, fresh garlic, garlic powder, onion powder, lemon or vinegars.
- Limit frozen convenience foods and fast food restaurant meals.
- With time, your taste buds will adjust to the natural flavours of food without added salt.

Do the DASH!

Dietary Approaches to Stop Hypertension, or 'DASH' has been shown to help manage and even prevent high blood pressure. The DASH diet can easily be part of a healthy diet for people with diabetes. It emphasizes whole grains, vegetables and fruits, low-fat dairy products, lean meats, and is low in saturated and trans fats.

Food Group	Daily Servings	Serving Sizes (1 serving is equivalent to)
Grains	6-8	<ul style="list-style-type: none">• 1 slice bread• 1 ounce dry cereal• ½ cup cooked rice, pasta, cereal
Vegetables	4-5	<ul style="list-style-type: none">• 1 cup raw leafy vegetables• ½ cup cut up raw or cooked vegetables
Fruits	4-5	<ul style="list-style-type: none">• 1 medium piece of fruit• ¼ cup dried fruit• ½ cup fresh, frozen or canned fruit
Fat-free or low-fat milk and milk products	2-3	<ul style="list-style-type: none">• 1 cup milk or yogurt• 1½ ounce cheese
Meat and alternatives; Lean meats, poultry, and fish; Nuts, seeds, and legumes	6 or less	<ul style="list-style-type: none">• 1 ounce cooked meats, poultry or fish, 1 egg• 1/3 cup nuts• 2 tbsp peanut butter• 2 tbsp of seeds• ½ cup cooked legumes
Fats and oils	2-3	<ul style="list-style-type: none">• 1 tsp soft margarine (non-hydrogenated)• 1 tsp vegetable oil• 1 tbsp mayonnaise• 2 tbsp salad dressing

References: (1) Appel, L.J. et al. 1997. N Eng J M 336:1117-24. U.S. Department of Health and Human Services; National Institutes of Health; National Heart, Lung, and Blood Institute. *Your Guide to Lowering Your Blood Pressure with DASH*. 2006. (2) Adapted from: Vancouver Coastal Health. *Sodium and Kidney Disease*. 2008.

Talk to a registered dietitian to learn more about healthy eating.



Be a non-smoker

- Smoking affects blood pressure in 2 ways: Nicotine in cigarette smoke causes blood vessels to narrow, which increases blood pressure.
- Smoking makes blood pressure medications work less effectively. Ask your doctor about local programs and medications that may help you to quit.

Managing stress

To help cope with stress, try physical activity, socializing, laughter, and healthy eating. Avoid unhealthy stress busters such as smoking, alcohol use, or poor food choices. Help is available if you need it. Remember to make time for yourself!

Alcohol

Alcohol raises blood pressure by interfering with the blood flow to and from the heart. Drinking alcohol can lead to both high and low blood sugar and possibly high triglycerides. Talk to your doctor to see if alcohol is a choice for you.

Medication

When healthy behaviour changes are not enough, your doctor may prescribe medication. Most people need two or more drugs to bring down their blood pressure to a healthy level. It is important to take your medications as prescribed. Try to take them at the same time every day.

Treating high blood pressure may require time, patience and care by both you and your doctor. Your doctor might have to try different medications or combinations of medications to see which ones work the best for you with the fewest side effects. It is important to continue taking your medications, even when your blood pressure is at target.

Talk to your doctor or pharmacist if you have any questions about your medications.

THE BOTTOM LINE

Healthy eating, physical activity, managing weight and stress, and taking your medications as prescribed can all help you to control your blood pressure.

Related articles: *Staying healthy with diabetes*, *Your guide to lowering your blood pressure with DASH*: https://www.nhlbi.nih.gov/files/docs/public/heart/hbp_low.pdf

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Diabetes Canada is making the invisible epidemic of diabetes visible and urgent. Eleven million Canadians have diabetes or prediabetes. Now is the time to End Diabetes - its health impacts as well as the blame, shame and misinformation associated with it. Diabetes Canada partners with Canadians to End Diabetes through education and support services, resources for health-care professionals, advocacy to governments, schools and workplaces, and, funding research to improve treatments and find a cure.

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Have you had your cholesterol tested lately?

Most adults with type 1 or type 2 diabetes are at high risk for heart disease such as heart attack and stroke. People with diabetes have an increased risk of these diseases even if their LDL-cholesterol is “normal”. They have an even higher risk if their LDL-cholesterol is elevated.

Adults with diabetes should have their cholesterol tested yearly or as indicated by your health-care provider. More frequent testing may be necessary for people taking cholesterol medications. Always discuss your cholesterol results with your doctor and other members of your health-care team.

Have you been told that you have high cholesterol?

High cholesterol usually refers to high LDL (“bad”) cholesterol. The main goal is to lower LDL-cholesterol. Check with your health-care provider to find out if you should be on medication to accomplish this. Weight management, healthy eating and regular physical activity will also help you reach this goal. This pamphlet will help you make healthy choices.

Diabetes management requires good blood sugar, blood pressure and cholesterol control.

Definitions

Heart (cardiovascular) disease: damage to the heart and blood vessels. One cause is narrowing of the blood vessels due to fat deposits on the vessel walls, which limits blood flow.

Cholesterol: a fat substance that is naturally present in your blood and cells. There are two main types of cholesterol: LDL and HDL.

- **LDL (low-density lipoprotein):** often called “bad” cholesterol because higher levels of LDL can increase the risk of heart disease.
- **HDL (high-density lipoprotein):** often called “good” cholesterol because higher levels of HDL can reduce the risk of heart disease.

Triglyceride: a form of fat that the body makes from sugar, alcohol or other food sources.



How can I manage my cholesterol through healthy living?

In addition to taking cholesterol medications as prescribed, being at a healthy weight, having healthy eating habits and doing regular physical activity help you manage cholesterol and reduce your risk of developing heart disease.



Main goal: Lowering LDL-cholesterol

LDL target: less than 2.0 mmol/L or as recommended by your doctor

My LDL:

Healthy eating tips

- Choose lower-fat foods
- Limit saturated fats
- Avoid trans fats
- Limit food sources of cholesterol
- Choose high-fibre foods

To help lower LDL cholesterol, replace saturated and trans fats with small amounts of unsaturated fats such as:

- olive oil
- canola oil
- peanut oil
- nuts and seeds such as peanuts, almonds and ground flax
- soft non-hydrogenated margarine

Make healthier choices from each of the food groups:

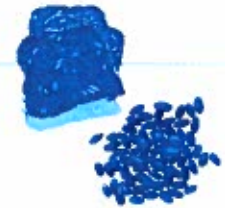
Milk & Alternatives

- Choose lower-fat milk (such as skim or 1%) and milk products (such as low-fat yogourt)
- Choose low-fat milk alternatives such as soy- or rice-based products



Grains & Starches

- Choose whole grains
- Choose high-fibre grains, especially those with soluble fibre (such as barley, brown rice, multigrain pasta)
- Choose low-glycemic index foods



Fruits

- Choose whole and unprocessed fruit for more fibre



Vegetables

- Choose a variety of colours
- Choose high-fibre vegetables
- Choose fresh vegetables, if possible



Meat & Alternatives

- Choose at least two meals per week of fatty fish (such as salmon, trout, sardines)
- Choose plant protein more often (such as tofu, legumes, lentils)
- Choose lean meats, trim visible fat, remove skin from poultry
- Choose lower-fat cheese (less than 20% milk fat [MF])



Body size

A healthy weight is assessed in many ways. Ask your health-care team about your body mass index (BMI), waist measurement and weight goals.

FACT: You are at a higher risk if you carry most of your weight around the abdomen.

If overweight, losing 5–10% of your current body weight through physical activity and healthy eating can help improve your cholesterol levels.

My BMI: _____

My target BMI: _____

My waist measurement: _____

My target waist measurement: _____

My current weight: _____

A 5–10% weight loss: _____

Physical activity

Regular physical activity can help with your overall diabetes management and improve your heart health. Aim for at least 150 minutes per week (such as one 30-minute session or three 10-minute sessions a day, five days per week) and resistance exercise 2–3 times per week.

Ask your health-care team for tips on how to get started and how to maintain regular physical activity.

Ways I can get regular physical activity:

Read the nutrition facts

Look at the label to make healthy food choices

Nutrition Facts	
Per 90 g serving (2 slices)	
Amount	% Daily Value
Calories 170	
1 Fat 2.7 g	4 %
Saturated 0.5 g + Trans 0 g	5 %
Cholesterol 0 mg	
Sodium 200 mg	8 %
Carbohydrate 36 g	13 %
4 Fibre 6 g	24 %
Sugars 3 g	
Protein 8 g	
Vitamin A 1 %	Vitamin C 0 %
Calcium 2 %	Iron 16 %

1. Serving size

Compare the serving size on the package to the amount that you eat.

2. % Daily Value (% DV)

tells you if there is a little or a lot of nutrient in one serving. Compare similar products. Choose foods with a lower % DV of fat and a higher % DV of fibre.

3. Fat

- Choose foods with lower fat content.
- Choose foods with little or no saturated fat.
- Choose foods with no trans fat.

4. Fibre

- Choose foods high in fibre.
- Aim for 25 g or more of fibre per day.

Read the Ingredient List on food packages. Avoid foods containing these fats:

- Hydrogenated or partially hydrogenated oil, shortening.
- Tropical fats such as coconut, palm or palm kernel.

Am I doing all I can to lower my LDL?

Am I ready to do more for my heart health? I'll review my LDL-lowering goals before moving on to the next steps.

I am taking my cholesterol medication(s) as prescribed by my doctor.

Yes No

My weight is in the healthy range.

Yes No

My waist measurement is in the healthy range.

Yes No

I choose low-fat foods and avoid saturated and trans fat.

Yes No

I limit cholesterol-containing foods.

Yes No

I make high-fibre choices (such as whole grains).

Yes No

I eat enough vegetables and fruit servings every day.

Yes No

I am physically active on a regular basis.

Yes No

If you answered YES to all the above, it means you are on the right track. If you answered NO to one or more of the goals, decide what steps you are ready to take.

My goals:

If your triglyceride level is very high, your doctor may suggest you lower it with medications and healthy living habits. The following can help improve your triglyceride level:

- Limit alcohol intake
- Achieve and maintain a healthy weight
- Achieve and maintain excellent blood sugar control
- Limit added sugar and low-fibre foods such as regular pop, candy, sugar-sweetened cereals



Related articles: *Physical activity and diabetes, High blood pressure and diabetes, Managing weight and diabetes, Smoking and diabetes*

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What medications should I be taking to protect myself from heart disease and stroke?

Select which box best describes you:

I have problems with my circulation:

- I have had a heart attack, surgery or angioplasty for blocked heart blood vessels
- I have chest pain when I exercise (angina)
- I have leg pain when walking due to blocked blood vessels in my legs
- I have had surgery for blocked blood vessels (arteries) in my legs
- I have had a stroke, or "mini-stroke" (also called a TIA)
- I have had surgery on a carotid artery for blockage

If you checked at least one of these circles, ask your health-care team about these medications :

1. ASA (Aspirin)
2. Blood pressure pills (ACE inhibitors or ARBs)
3. Cholesterol lowering pills (statins)
4. Medications that lower blood sugar with proven heart benefit, if your A1C is not at target (for type 2 diabetes only)

...and ALWAYS talk to your team about a healthy lifestyle that is right for you.

▼ If you did not select the box above, then go to the next section. ▼

I have one or more of these problems from my diabetes:

- I have been told that diabetes has affected the back of my eyes (retinopathy)
- I have been told there is protein in my urine (kidney disease)
- I have been told that I have decreased kidney function due to my diabetes (kidney disease)
- I have pain or numbness of my feet due to diabetes (neuropathy)

OR

I am 55 years old or older and have another risk factor for heart disease or stroke

If you checked at least one of these boxes, ask your health-care team about these medications:

1. Blood pressure pills (ACE inhibitors or ARBs)
2. Cholesterol lowering pills (statins)

...and ALWAYS talk to your team about a healthy lifestyle that is right for you.

▼ If you did not select the box above, then go to the next section. ▼

I am 40 years old or older and living with diabetes

OR

I am over 30 years old and have lived with diabetes for more than 15 years

If you checked one of these boxes, ask your health-care team about:

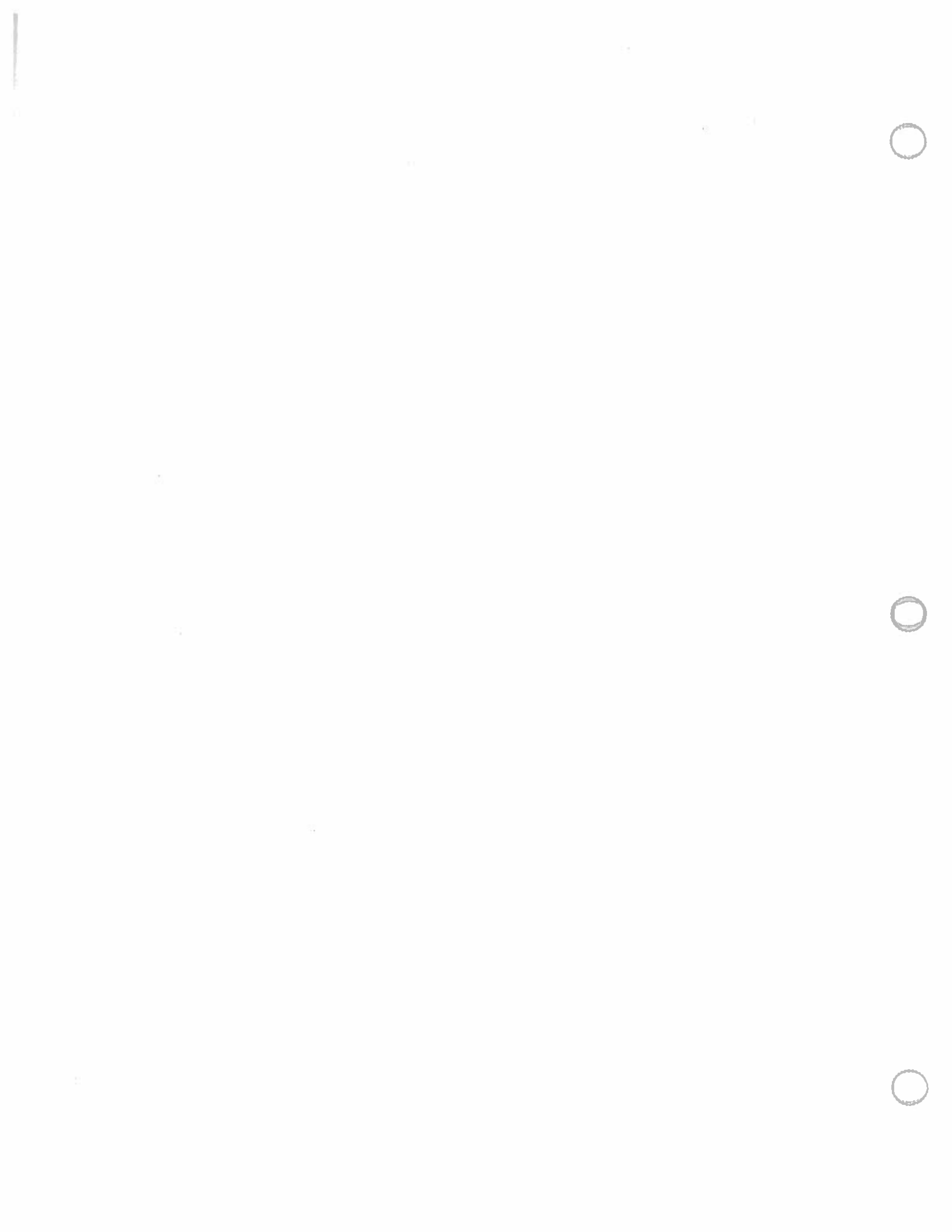
1. Cholesterol lowering pills (statins)

...and ALWAYS talk to your team about a healthy lifestyle that is right for you.

Work with your health-care team on your ABCDESSS to help you live well with diabetes.

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**DIABETES
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Smoking *and* diabetes



Why is it so hard to quit?

Simply put, nicotine is among the most addictive drugs. Smoking is not a habit or a lifestyle choice. It's an addiction that over time, changes brain chemistry. Nicotine has its effect by attaching to certain receptors in the brain, and when you become a smoker these receptors increase in number. If not regularly stimulated with nicotine, the increased receptors begin to make a person feel very unpleasant, a phenomenon known as withdrawal. Both withdrawal and the craving it causes are tied to changes in brain chemistry.

Quitting smoking is one of the most important things individuals living with diabetes can do to help prevent or delay the onset of complications.

Why is smoking so bad for people with diabetes?

Smoking is bad for everyone. It increases your risk for lung cancer, heart attack and stroke. Each year, more than 45,000 Canadians die of smoking-related illnesses. People with diabetes face an even greater risk from smoking: just like high blood glucose levels, the poisonous chemicals in cigarette smoke attack blood vessels. This contributes to hardening of the arteries (or what is known as atherosclerosis) which impairs the blood's ability to carry oxygen throughout the body.

Together, the deadly combination of high blood glucose and smoking dramatically increases damage to the blood vessels that feed the heart, brain, eyes, kidneys and peripheral nerves, speeding up the long-term complications of diabetes.

How can I quit?

The first critical step is to make the decision to quit. It may help to set a firm, short-term quit date. In the meantime, get as much information as you can from your doctor or pharmacist about options to help you quit, including medications that can increase your chances of success. Similar to the day-to-day process of managing your diabetes through diet, exercise and regular blood glucose testing, managing to quit smoking is something that is best approached by incorporating it into your daily routine.

What can help me quit smoking?

Nicotine replacement therapy

The first line of treatment is nicotine replacement therapy, whether in the form of a gum, patch or inhaler, to help ease withdrawal symptoms.

Nicotine replacement therapy is now available without a prescription in pharmacies. Talk to your healthcare provider about the potential benefit of nicotine replacement therapy.





Oral Medications

Your doctor can help prescribe a medication that can help reduce your smoking cravings. Speak to your doctor if these medications are suitable for you as they might interfere with other medications or health issues.

Lifestyle changes

Smoking often is associated with strong cues, so as you move toward a quit date, get a sense of where and when you smoke, and identify some strategies to bypass those situations. If you typically smoke after dinner, take a walk instead. Any setting where alcohol is involved, such as a wedding or a party, will probably be a hazard zone so just as you may plan to adjust your food intake or insulin dosage, consider in advance how you will handle these situations.

Enlist your family and friends in the effort. Make sure they understand how important it is for you to quit smoking and how hard it may be, and ask for their support. For some people, joining a support group along with others who are also trying to quit is helpful. Your doctor may have some information on groups in your community. For more information online go to www.gosmokefree.ca and www.smokershelpline.ca.

Never quit quitting!

Making the transition from smoker to nonsmoker is not easy, and you may have a lapse. If you do, give yourself a break. Don't focus on the one cigarette you just had, but remember the hundreds you haven't had since you quit. Manage your quitting plan much like you manage your diabetes – take it one day at a time.

The fact is, successful quitters generally make at least two or three unsuccessful attempts before they finally kick the habit, so never quit quitting!

Across the country, the Canadian Diabetes Association is leading the fight against diabetes by helping people with diabetes live healthy lives while we work to find a cure. Our community-based network of supporters help us provide education and services to people living with diabetes, advocate for our cause, break ground towards a cure and translate research into practical applications.

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 **Canadian
Diabetes**
Association

Related articles: *High blood pressure and diabetes, Staying healthy with diabetes*

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Stay Safe When You Have Diabetes and Are Sick or at Risk of Dehydration



You are at risk of dehydration if you have any of any of the following:

- Vomiting
- Diarrhea
- Fever
- Excessive exposure to heat and/or humidity without drinking enough



DRINK plenty of fluids, with minimal sugar (unless you have been told to limit fluids)

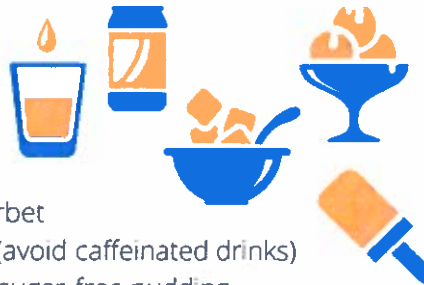
- Consider electrolyte replacement solutions (such as Gastrolyte®, Hydralyte®, Pedialyte®), clear soups or broths, water, diet soda (e.g. diet ginger-ale), watered down apple juice
- Limit caffeine (from coffee, tea and soda drinks) which makes dehydration worse



PREVENT low blood sugar (hypoglycemia).

If you cannot eat your usual foods, try any of the following foods, each containing about 15g of carbohydrates.

- 1 cup milk*
- 2/3 cup juice
- 1/2 cup applesauce
- 1/2 cup regular Jell-O
- 1/2 cup flavoured yogurt*
- 1/2 cup ice cream* or sherbet
- 2/3 cup regular soft drink (avoid caffeinated drinks)
- 1/4 cup pudding or 1/2 cup sugar-free pudding
- 1 twin popsicle



* Consider avoiding these foods if vomiting or diarrhea

IF YOU ARE USING INSULIN, you need to check your blood sugar more often and you might need to adjust the amount of insulin you inject

IF YOU ARE EATING LESS THAN NORMAL, and the symptoms last more than 24 hours, you should TEMPORARILY STOP:

Certain Diabetes Pills

- Secretagogues: e.g. Gliclazide (Diamicon®), Gliburide (Diabeta®), Repaglinide (GlucoNorm®)



If the symptoms last more than 24 hours and you continue to be dehydrated, or at risk of dehydration, you should also TEMPORARILY STOP:

Certain Blood Pressure / Heart Medications

- ACE Inhibitors: e.g. Enalapril (Vasotec[®]), Fosinopril (Monopril[™]), Lisinopril (Prinivil[®]/Zestril[®]), Perindopril (Coversyl[®]), Quinapril (Accupril[™]), Ramipril (Altace[®]), Trandolapril (Mavik[®])
- ARBs: e.g. Candesartan (Atacand[®]), Eprosartan (Teveten[®]), Irbesartan (Avapro[®]), Losartan (Cozaar[®]), Olmesartan (Olmotec[®]), Telmisartan (Micardis[®]), Valsartan (Diovan[®])

All Water Pills

- e.g. Chlorthalidone (Hygroton), Furosemide (Lasix[®]), Hydrochlorothiazide, Indapamide (Lozide[®]), Metolazone (Zaroxolyn[®]), Spironolactone (Aldactone[®])

Certain Diabetes Pills

- Metformin (Glucophage[®] or Glumetza[®])
- SGLT2 Inhibitors: e.g. Canagliflozin (Invokana[®]), Dapagliflozin (Forxiga[®]), Empagliflozin (Jardiance[™])

Anti-Inflammatory Pain Medications

- e.g. Ibuprofen (Advil[®]/Motrin[®]), Celecoxib (Celebrex[®]), Diclofenac (Voltaren[®]), Ketorolac (Toradol[®]), Naproxen (Aleve[®]/Naprosyn[®])

Note: The list above does not include the names of medications that come in combination (2 medications in one tablet).

Ask your pharmacist to tell you:

The medications I need to TEMPORARILY STOP are:

When I am eating less than normal:

When I am dehydrated:

This personalized list last reviewed (date):

Note: RESTART these medications when you are eating and drinking normally.

Call your health-care team (Pharmacist, Doctor, Nurse Practitioner, Nurse, Dietitian) and/or go the Emergency Department

- If you cannot drink enough fluids
- If you don't know which medications to stop
- If you don't know how to adjust your insulin
- If you have been told to check your ketones and they are moderate to high
- If you have any of the following that are not getting better: vomiting, diarrhea, stomach pain, frequent urination, extreme thirst, weakness, difficulty breathing or fever