

TYPE 2 DIABETES AND BLOOD SUGAR



WHAT IS TYPE 2 DIABETES?

Type 2 diabetes is a chronic condition in which your pancreas does not produce enough insulin, or your body does not properly use the insulin it makes. As a result, sugar (glucose) builds up in your blood (blood glucose/blood sugar) instead of being used for energy.

When blood sugars remain too high, they can damage organs, blood vessels and nerves.

Symptoms develop gradually and we may not recognize them or may adapt and forget about them. That is why it is important to occasionally check your blood sugar and/or A1c.

POSSIBLE SIGNS THAT YOUR BLOOD SUGAR MAY BE HIGH:

- Increased thirst
- Increased urination
- Weight loss
- Fatigue
- Blurred vision
- Extreme thirst
- Light-headedness.
- Acanthosis Nigricans
- Restlessness, drowsiness, or difficulty waking up.

RISK FACTORS FOR TYPE 2 DIABETES:

- Being 40 years of age or older
- Having a close relative (parent or sibling) who has type 2 diabetes
- Being a member of a high-risk population, such as those of African, Arab, Asian, Hispanic, Indigenous or South Asian descent, low socioeconomic status
- Having a history of prediabetes
- Having some evidence of the complications of diabetes, such as eye, nerve or kidney problems

- Having heart disease, high blood pressure and/or high cholesterol
- Having a history of gestational diabetes mellitus
- Being overweight, especially around your abdomen
- Having a history of giving birth to a baby that weighed over 4 kg (9 lb) at birth
- Having obstructive sleep apnea
- Having a history of using glucocorticoid medication

REDUCE YOUR RISK:

- Eating nutritious meals and snacks
- Enjoying regular physical activity
- Monitoring your blood sugar
- Aiming for a healthy body weight
- Taking diabetes medications including insulin, if prescribed by your doctor
- Managing stress effectively
- Limiting alcohol
- Limit or no commercial tobacco use
- Consistent restful sleep

HOW CAN YOU MEASURE YOUR SUGAR LEVEL?

- Capillary Blood Glucose: a way to measure sugar levels in the blood using a small drop of blood from a finger prick, a test strip, and a portable meter
- Glycated hemoglobin (also called A1C): A simple blood test to check your average blood glucose control for the last 2 to 3 months.
- Interstitial glucose uses a sensor to track fluid surrounding tissue cells

	FASTING BLOOD GLUCOSE	A1C
Normal (rescreen as recommended)	< 5.6 mmol/L	< 5.5%
At risk (rescreen more often)	5.6 – 6.0 mmol/L	5.5% - 5.9%
Prediabetes (rescreen more often)	6.1 – 6.9 mmol/L	6.0% - 6.9%
Diabetes	≥ 7.0 mmol/L	6.5%

Check out Diabetes Canada to learn more about type 2 diabetes, type 1 diabetes, type 1.5 diabetes (Latent Autoimmune Diabetes in Adults/LADA), gestational diabetes and prediabetes

ROUTINE SCREENING WHEN LIVING WITH DIABETES



KIDNEY HEALTH

- Blood work (creatinine/eGFR) done every year
- Urine sample (microalbuminuria/ACR) done every year
- Level shows how well your kidneys are working: A high level of creatinine and/or a low eGFR may mean your kidneys are not working as well as they should:
 - **Creatinine** is a waste product that muscles release into the blood. Blood creatinine is used to estimate the glomerular filtration rate.
 - o Normal: An eGFR of 90 or higher
 - o Reduced/mildly decreased: An eGFR between 60 and 89 may indicate early-stage kidney damage (Stage 2)
 - o Kidney Disease: A value below 60 for three months or more with or without other evidence of kidney damage, suggest chronic kidney disease (CKD)
 - o Kidney Failure: An eGFR below 15
- **Albumin** is normally found in the blood. With kidney damage small amounts of it (microalbumin) leak into the urine.
 - o Normal: < 3.0mg/mmol
 - o Moderately Increased (microalbuminuria): 3.0 – 60 mg/mmol (indicated potential damage/chronic kidney disease)
 - o Severely Increased (Macroalbuminuria): ≥ 60mg/mmol

EYE HEALTH

- Assessed every year for diabetic retinopathy
- Vision acuity assessed every 2 years

DENTAL HEALTH

- Assessed every year for any changes

FOOT HEALTH

- Check daily by yourself or a family member/friend
- Assessed every 3 months to yearly by foot care nurse or primary care provider

EMOTIONAL HEALTH

- Assessed at every appointment at a minimum every year

HEART HEALTH

Lipid Profile based on Canadian Guidelines:

- Blood work done at time of diagnosis and then every year. If treatment (medication) required, increased frequency of testing.
- Fasting (preferred) lipid profile (total cholesterol (TC), HDL-C, TG and calculated LDL-C):
 - Total Cholesterol: < 5.20 mmol/L
 - LDL Cholesterol (“Bad”): < 3.5 mmol/L
Living with diabetes < 2.0 mmol/L
 - HDL Cholesterol {“Good”}: > 1.0mmol/L for men; > 1.3mmol/L for women
 - Triglycerides: < 1.7mmol/L
 - Non-HDL-C: < 4.2mmol/L
Living with diabetes < 2.6mmol/L
 - Apolipoprotein B: < 0.8 g/L

ECG (electrocardiogram): every 3-5 years

LIVER HEALTH

- Blood work done for anyone with prediabetes or a diabetes diagnosis and then yearly: ALT, AST, CBC and Fibrosis-4 (FIB-4):

Normal Ranges:

- ALT (Alanine Aminotransferase):
 - 7 – 63 IU/L
 - > 63 IU/L may indicate potential liver inflammation or damage
- AST (Aspartate Aminotransferase):
 - 15- 37 IU/L
 - > 37 IU/L may indicate potential liver inflammation or damage
- ALP (Alkaline Phosphatase):
 - Approx. 44 – 147 IU/L
 - < 44 IU/L may indicate issues in the biliary system (blockage)
- Albumin:
 - > 35 g/L
 - < 35 g/L may suggest chronic liver disease
- FIB-4 results:
 - Low Risk: < 1.30
 - Indeterminate risk for advanced liver fibrosis. May warrant further testing: 1.3 – 2.67
 - High risk for advanced liver fibrosis. Warrants further testing: > 2.67

Screening frequency may be different based on your personal health as determined by your primary care provider. This resource identifies general screening guidelines.

Record of my results (Know my Numbers)

Date of screening:

Blood pressure

Blood glucose (blood sugar)

Glycated hemoglobin (A1c)

Waist circumference

Diabetic Retinopathy (DR)

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Share results with your primary care provider and ask about checking:

- Lipid panel (total cholesterol, HDL, LDL, triglycerides)
- Kidney function (urine and blood sample)
- Liver screen (Fibrosis-4/FIB-4)
- Heart (ECG)
- Foot assessment (filament)
- Vision/routine eye assessment (acuity)
- Diabetes Distress Screen/emotional health
- Dental appointment

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FIBROSIS-4 (FIB-4) INDEX

AVAILABLE IN ONTARIO

Information for Healthcare Providers

Non-alcoholic fatty liver disease (NAFLD) is a major cause for liver disease worldwide¹. An estimated 7.8 million Canadians are living with NAFLD. The Prevalence of NAFLD will increase by 20% through 2030². NAFLD encompasses simple steatosis, nonalcoholic steatohepatitis (NASH), fibrosis and, ultimately, cirrhosis⁶. Screening for increased risk of advanced fibrosis is essential for triaging NAFLD patients for specialist care and better management. The FIB-4 index is a simple, non-invasive, and readily available marker for the screening for liver fibrosis³⁻⁴. The FIB-4 score is calculated from aspartate aminotransferase (AST), alanine aminotransferase (ALT), complete blood count (CBC), and age⁷.

WHEN TO ORDER A FIB-4 INDEX FOR NAFLD

Recently, the American Association of Clinical Endocrinology (AACE) indicated that clinicians should consider persons with the following conditions to be at high risk for NAFLD and advanced fibrosis⁵:

- Obesity
- Metabolic syndrome
- Prediabetes
- Type 2 Diabetes (should consider screening using FIB-4, even with normal liver enzyme levels)
- Hepatic steatosis on any imaging study
- Persistently elevated ALT or AST levels (over 6 months)

The AACE recommends ordering the FIB-4 index as the preferred test for the screening for clinically

significant fibrosis in NAFLD patients. Clinicians should consider further follow-up with transient elastography or an ELF blood test in patients with increased risk of advanced fibrosis and indeterminate or high FIB-4 score.

BENEFITS OF CHOOSING LIFELABS FOR FIB-4 INDEX TESTING

- LifeLabs is pleased to introduce the FIB-4 index in Ontario, allowing physicians to order it along with ALT, AST and CBC, as a convenient testing option, with promising clinical utility in defining NAFLD patients with increased risk of clinically significant fibrosis and reducing unnecessary biopsies
- As Canada's largest community lab, we are an industry leader in ensuring exceptional quality testing in our state-of-the-art facilities

- Competitive pricing and quick turnaround times allow you to get the important diagnostic information you need when you need it



For more information, please contact our Ontario Customer Care Centre at:
1-877-849-3637

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HOW TO ORDER

To order FIB-4, all 4 component tests must be ordered. If any are missed, the Fib 4 cannot be performed:

- Write 'FIB-4', 'FIB-4 index', 'Fib-4 score', 'Fibrosis index', or 'Fibrosis score' in the 'other tests' section of the standard OHIP requisition
- Write 'Aspartate aminotransferase (AST/ SGOT)' in the 'other tests' section
- Select Alanine aminotransferase (ALT/SGPT) on the OHIP requisition
- Select Compete Blood Count (CBC) on the OHIP requisition
- Your patients can then make an appointment at a LifeLabs Patient Service Centre (PSC) for their blood draw. Patients must present the FIB-4 Index requisition signed by a physician or healthcare provider.
- Specimen collection requirements are similar to ALT, AST and CBC

Please note:

- AST is only insured under OHIP when ordered by or on the advice of a physician with expertise in hepatic disorders
- The FIB-4 index is not insured under OHIP

REFERENCE RANGE AND RESULTS REPORTING

The following interpretive comment will be provided with FIB-4 index:

- **< 1.30:** Low risk for advanced liver fibrosis
- **1.30 - 2.67:** Indeterminate risk for advanced liver fibrosis. May warrant further testing.
- **>2.67:** High risk for advanced liver fibrosis. Warrants further testing.

TURNAROUND TIME

- Within 1 day of specimen drop off.



THE FIBROSIS-4 (FIB-4) INDEX



The Fibrosis-4 (FIB-4) index is a non-invasive medical tool that estimates liver scarring (fibrosis) using a patient's age, platelet count, AST, and ALT blood test levels.

Formula and Calculation

The index is calculated with this equation:

$$\text{FIB-4} = \frac{\text{Age} \times \text{AST}}{\text{Platelets} \times \sqrt{\text{ALT}}}$$

Score Interpretation

- **Less than 1.30:** Low risk of advanced liver fibrosis (negative predictive value is high, meaning significant scarring is unlikely).
- **1.30 to 2.67:** Moderate or indeterminate "grey zone" risk; often requires secondary testing like a FibroScan.
- **Greater than 2.67 (or 3.25 depending on guidelines):** Higher risk of significant liver fibrosis or cirrhosis, which may prompt a specialist referral or further diagnostic evaluation

SODIUM GUIDELINES



Daily salt/sodium intake:

Recommended: 1,500mg per day
Maximum Limit: 2,300mg/day
Average consumption: 2,760mg/day

What does 2300mg salt look like? 1 teaspoon of salt

Guidelines for ages:

1-3yrs: 800mg/day
4-8yrs: 1,000mg/day
9-13yrs: 1,200mg/day
Adult (14-50): 1,500mg/day
Adult (51-70): 1,300mg/day
Adult (70+): 1,200mg/day

Excessive sodium intake is associated with increased risk of high blood pressure, heart disease, stroke and kidney disease

- Check the Nutrition Facts table for the % Daily Value (%DV). 5% or less is low, while 15% DV or more is high
- Choose fresh foods instead of processed or packaged items – rinse to reduce
- Limit processed items such as canned soups, sauces and deli meats

These are guidelines and your individual intake or requirements may be different based on your personal health as determined by your primary care provider.

PROTEIN



Recommended Dietary Allowance (RDA) for protein in Canada is 0.8mg per kilogram of body weight (0.36g per pound) for healthy adults, which for a 70kg (154lb) person is roughly 56g daily.

For optimal health, muscle maintenance or active lifestyles, and older adults (40-50+), higher intakes of 1.0 – 1.2g/kg may be recommended. Protein should ideally constitute 10-35% of your daily calories

Reduce the risk for sarcopenia (age related muscle loss) by ensuring 1.0 – 1.2g/kg

These are guidelines and your individual intake or requirements may be different based on your personal health as determined by your primary care provider.

HEALTHY HABITS CHECKLIST

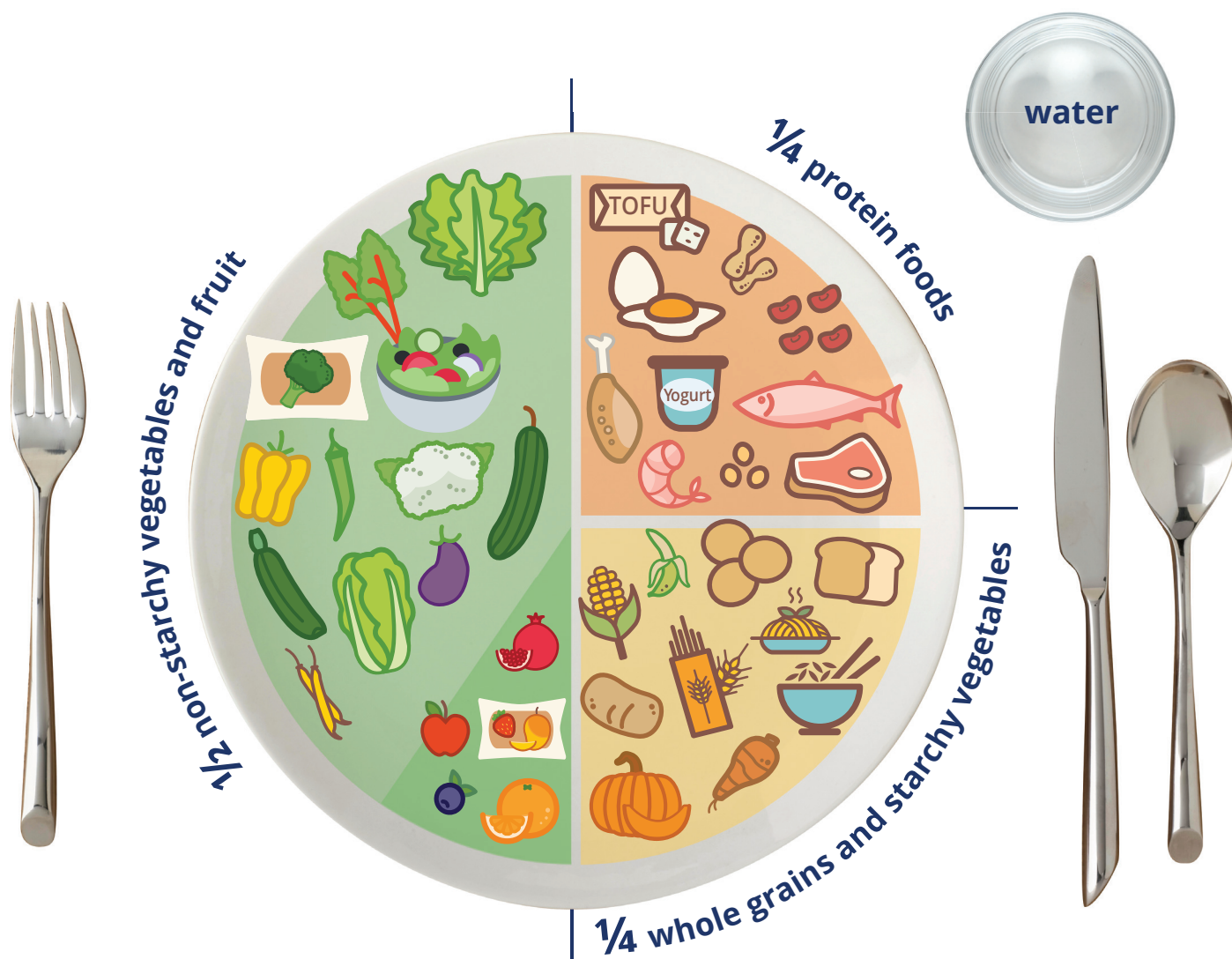


- | | |
|--|--|
| 1. I get enough sleep | ☐ Yes ☐ No ☐ Not sure |
| 2. I nourish my body, such as choosing low-fat foods and avoiding saturated, trans fats and processed foods | ☐ Yes ☐ No ☐ Not sure |
| 3. I make high-fibre choices, such as eating whole-grain breads, cereals, lentils and dried beans | ☐ Yes ☐ No ☐ Not sure |
| 4. I try to balance my plate | ☐ Yes ☐ No ☐ Not sure |
| 5. I drink 6-8 glasses of water each day | ☐ Yes ☐ No ☐ Not sure |
| 6. I stay physically active by exercising 150 minutes (at a minimum) each week | ☐ Yes ☐ No ☐ Not sure |
| 7. I limit sugary drinks | ☐ Yes ☐ No ☐ Not sure |
| 8. If living with diabetes, I monitor my blood sugar and HbA1c and take my medications as my doctor prescribed | ☐ Yes ☐ No ☐ Not sure |
| 9. I know my numbers (blood pressure, blood sugar, cholesterol, waist circumference) | ☐ Yes ☐ No ☐ Not sure |
| 10. I manage stress in a healthy way | ☐ Yes ☐ No ☐ Not sure |
| 11. I limit the alcohol I drink | ☐ Yes ☐ No ☐ Not sure |
| 12. I am a non-smoker or may cut down or quit commercial tobacco use | ☐ Yes ☐ No ☐ Not sure |

If you answered yes to most, keep choosing to live a healthy lifestyle. If you answered no to one or more, think about ways to make 1 or 2 healthy lifestyle changes.

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The Balanced Food Plate



Use the balanced plate approach to make your meals

Using the balanced plate approach applies to all mealtimes, even if you use a bowl! The balanced plate is designed to help you meet your nutrient needs and manage your blood sugar. All foods can fit in the balanced plate approach, it's the portions of each type of food that matter the most.

Here are some examples of meals that follow the plate model:

Breakfast:

- 3/4 cup low-fat plain Greek yogurt + 1 cup strawberries + 1 cup high-fibre wheat cereal
- 1 cup old fashioned oatmeal + 1/4 cup almonds + 3/4 cup frozen blueberries

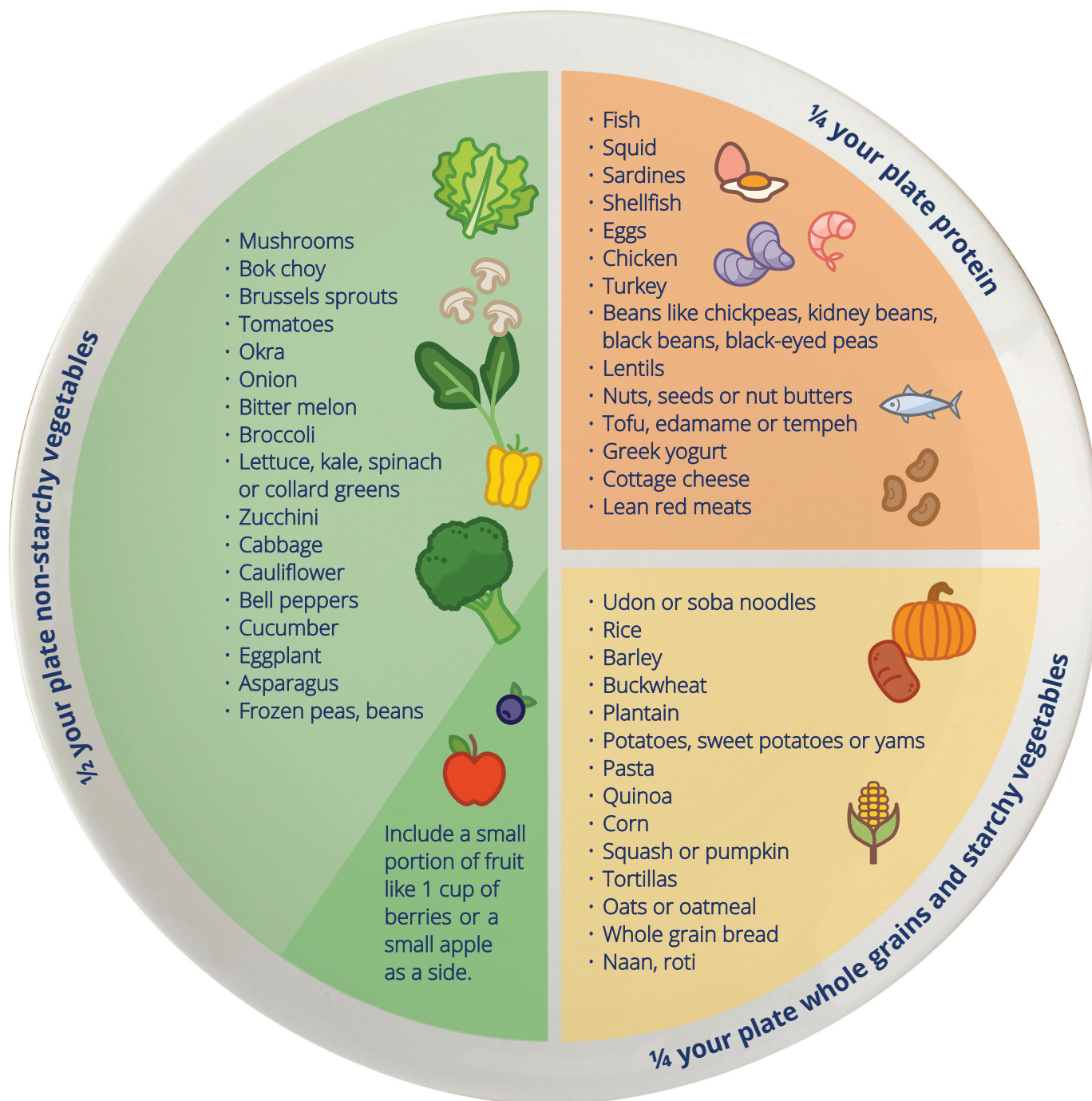
Lunch:

- 2 cups lentil soup + 1 cup cut up vegetables + 1 whole grain bun + 1 cup milk
- 2 slices whole grain bread + 3/4 cup chicken salad + 2 cups salad + 1 orange

Dinner:

- 2 whole grain roti + 1 cup chicken curry + 2 cups cooked vegetables + 1 apple
- 1 1/2 cups whole grain pasta + 1 cup meat sauce + 2 cups sauteed vegetables

The balanced plate model includes:



It's natural to have questions about the food you eat.

A registered dietitian can help you learn about nutrition and answer questions about how to include your favourite foods in a healthy way.

As a general rule, there is no need to avoid alcohol because you have diabetes.

You *should not* drink alcohol if you:

- are pregnant or trying to get pregnant
- are breastfeeding
- have a personal or family history of drinking problems
- are planning to drive or engage in other activities that require attention or skill
- are taking certain medications. Ask your pharmacist about your medications.

Consider the following questions when deciding what is best for you.

	Yes	No
1 Is my diabetes under control?	☐	☐
2 Am I free from health problems that alcohol can make worse such as disease of the pancreas, eye disease, high blood pressure, high triglycerides, liver problems, nerve damage or stroke?	☐	☐
3 Do I know how to prevent and treat low blood sugar?	☐	☐

If you answered “no” to any of these questions, you should speak to your diabetes educator or health-care professional before drinking alcohol.

If you answered “yes” to all of these questions, it is OK to drink alcohol in moderation.

Moderate alcohol intake is limited to 2 standard drinks/ day or less than 10 drinks/ week for women; and limited to 3 standard drinks/ day or less than 15 drinks/ week for men.

This recommendation is the same for people without diabetes. For people with high blood pressure, alcohol should be limited to 1 drink/day for women and 2 drinks/day for men.



What is a “standard drink”?

1 standard drink (10 g of alcohol):



Beer

341 mL (12 fl.oz)
of regular strength beer
(5% alcohol)



Spirits

43 mL (1.5 fl.oz) of spirits
(40% alcohol)



Wine

142 mL (5 fl.oz) of wine
(12% alcohol)

Note: If you are carbohydrate counting, do not take insulin for the carbohydrate content of alcoholic drinks.

Health risks of alcohol use

You may have heard that alcohol has certain health benefits. However, any pattern of drinking can be harmful. Proven ways of improving your health include: healthy eating, being active, and being a non-smoker.

The Diabetes Canada Clinical Practice Guidelines recommend that:

- People with type 1 diabetes should be aware that moderate consumption of alcohol with, or 2 to 3 hours after, an evening meal may result in delayed low blood sugar (hypoglycemia) the next morning after breakfast, or up to 24 hours after alcohol consumption. This also applies to people with type 2 diabetes who are using insulin or insulin secretagogues.
- Alcohol should be limited to 2 standard drinks/ day or less than 10 drinks/ week for women, and limited to 3 standard drinks/ day or less than 15 drinks/ week for men.
- People with diabetes should discuss alcohol use with their diabetes health-care team.

Risks for people with diabetes

Alcohol can:

- affect judgement
- provide empty calories that might lead to weight gain if taken in excess
- increase blood pressure and triglycerides
- cause damage to liver and nerves including brain and sexual organs
- contribute to inflammation of the pancreas
- dehydrate the body which is very dangerous in someone with high blood sugar
- worsen eye disease

For young people in particular, alcohol use:

- can lead to addiction
- is associated with a dramatic increase in injuries and death



For those on insulin or some diabetes medications

Drinking alcohol can increase your risk of having low blood sugar. To reduce this risk, take the following steps:

BEFORE drinking alcohol

Eat regular meals, take your medication(s), and check your blood sugar levels frequently (keep your blood glucose meter with you).

- Always have a treatment for low blood sugar with you (such as 3 glucose tablets or 150 mL regular pop or 6 Life Savers®).
- Wherever you are, make sure someone with you knows your signs and symptoms of low blood sugar and how to treat it so they can help you.
- Be aware that glucagon, a treatment for low blood sugar, will not work while alcohol is in the body. Because of this, make sure that someone knows to call an ambulance if you pass out.
- Wear diabetes identification such as a MedicAlert® bracelet.

WHILE drinking alcohol

- Eat carbohydrate-rich foods when drinking alcohol. Some ideas:

- Eat extra carbohydrate-rich foods if you are dancing, playing sports or doing other physical activity.
- Always pour your own drinks. Use less alcohol and stretch your drinks with sugar-free mixes.
- Drink slowly. Make your second drink without alcohol.

AFTER drinking alcohol

- Tell a responsible person that you have been drinking. They should look for low blood sugar symptoms.

(eg.)

- Check your blood sugar before going to bed. Eat a carbohydrate snack if your blood sugar is lower than usual.
- Set an alarm or have a responsible person wake you up through the night and early morning – a delayed low blood sugar can occur **anytime up to 24 hours** after drinking alcohol.
- You need to get up on time the next day for any food, medication or insulin you normally take. Missed medication or insulin can lead to high blood sugar, ketones and diabetic ketoacidosis (DKA).

Carbohydrate and calorie content in some common alcoholic beverages and mixes

(The amounts listed are a general guide only)

Beverage	Standard serving size	Energy (kcal)	Carbohydrate content (g)
Beer:			
regular	341 mL (12 fl.oz)	147	12
light	341 mL (12 fl.oz)	99	6
non-alcoholic*	355 mL (~12 fl.oz)	40-80	9-17
low carb*	341 mL (12 fl.oz)	96	3
Spirits/Hard liquor	43 mL (1.5 fl.oz)	98	0
Liqueurs & Cordials	43 mL (1.5 fl.oz)	155-190	10-25
Wine:			
regular	142 mL (5 fl.oz)	106-127	2-4
dessert	142 mL (5 fl.oz)	233-243	18-21
non-alcoholic	142 mL (5 fl.oz)	9	2
Cooler:			
regular	355 mL (12 fl.oz)	178-258	21-38
light*	330 mL (12 fl.oz)	100	1
Mixes:			
Sugar free pop	250 mL (8 fl.oz)	0	0
Regular pop	250 mL (8 fl.oz)	107	28
Club soda	250 mL (8 fl.oz)	0	0
Tonic water	250 mL (8 fl.oz)	88	23
Orange juice	250 mL (8 fl.oz)	118	27
Tomato juice	250 mL (8 fl.oz)	44	9
Tomato and clam juice	250 mL (8 fl.oz)	123	28

Reference: Canadian Nutrient File, 2018; USDA Food Composition Databases, 2018; *Actual Label

The caloric and carbohydrate content may vary by brand, be sure to check the labels

THE BOTTOM LINE

- If you do not drink alcohol, don't start.
- If you choose to drink alcohol, intake should be moderate (daily intake should be limited to 2-3 drinks for adult men and 1-2 drinks for adult women). When drinking alcohol, make sure you know how to prevent and treat low blood sugar.
- Heavy alcohol drinkers (more than 21 drinks/week for men and more than 14 drinks/week for women) are strongly advised to reduce the amount of alcohol they drink. Heavy alcohol use can make blood sugar control more difficult and increases other health risks.
- Talk to your diabetes educator or health-care professional if you have questions.

Related article: *High blood pressure and diabetes*

**DIABETES
CANADA**

diabetes.ca | 1-800 BANTING (226-8464) | info@diabetes.ca

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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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 people 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. Every day, 100 Canadians die of smoking-related illnesses. People with diabetes face even greater risks from smoking, because just like high blood sugar 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 your blood's ability to carry oxygen throughout your body.

Together, the combination of high blood sugar 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 and most important step is to make the decision to quit. It may help to set a firm, short-term quit date. Gather 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 sugar testing, managing to quit smoking is something that is best approached by incorporating it into your daily routine. Your diabetes health-care providers will ask you if it is ok to give you advice, arrange therapy and provide support. They can support you as you move through your journey from decision making, to goal setting, to quitting.





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 health-care provider about the potential benefit of nicotine replacement therapy.

Oral Medications

Your doctor can prescribe smoking cessation medications to help reduce your smoking cravings. Speak to your doctor to learn 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. Ask for their support. For some people, joining a support group along with others who are also trying to quit is helpful. Your doctor or diabetes health-care provider may have some information about groups in your community. For more information and support, 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 relapse. 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.

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



Successful quitters generally may be unsuccessful with smoking cessation attempts before they finally kick the habit, so never quit quitting!

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HIGH BLOOD PRESSURE (HYPERTENSION)



BLOOD PRESSURE (BP) is the force of the blood pumped from the heart against the blood vessels

HIGH BLOOD PRESSURE occurs when there is too much pressure in your blood vessels. This can damage your blood vessels and cause health problems. Anyone can develop high blood pressure, but it becomes more common as you get older.

RISKS FOR HIGH BLOOD PRESSURE THAT YOU CAN CONTROL:

- Lifestyle factors
- Smoking
- Excessive alcohol
- Stress
- Diabetes
- Sleep apnea
- Unhealthy diet
- Obesity
- Sedentary lifestyle
- Health conditions (if properly managed, can help lower blood pressure)
- Kidney disease

RISKS FOR HIGH BLOODS PRESSURE THAT YOU CAN'T CONTROL:

- Age
- Family history (genetics)

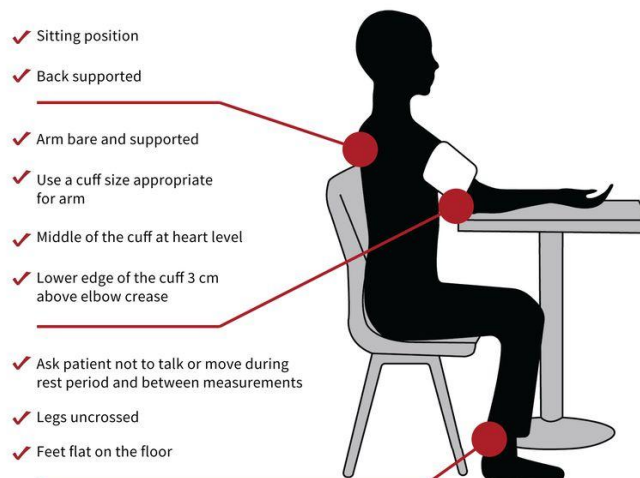
These are guidelines and your target BP may be different based on your personal health as determined by your primary care provider.

BLOOD PRESSURE (BP) is measured with two numbers: systolic (the higher number) and diastolic (the lower number) (e.g., 120/80 mmHg)

- **Systolic pressure** occurs when your heart contracts (maximum amount of force against blood vessel wall)
- **Diastolic pressure** occurs when your heart relaxes and fills with blood (least amount of force against blood vessel walls)

Risk for health	BP measurement
Low risk	120/80
Medium risk	131-139/80-89
High risk	140+/90

Optimal blood pressure measuring technique:



Proper preparation:

- Quiet and calm room
- No caffeine, tobacco, or exercise in the 30 minutes before the measurements

Appropriate equipment:

- Validated automated BP device (see <https://hypertension.ca/public/recommended-devices> or ask a pharmacist)
- Wide range of cuff sizes to select the appropriate size



Standardized protocol:

- If feasible, observe a rest period of 1–5 minutes before measurements
- Measure BP 3 times at 1-minute intervals
- Average and record all values

DIABETIC RETINOPATHY



WHAT IS DIABETIC RETINOPATHY?

Diabetic Retinopathy (DR) is an eye condition that can cause vision loss and blindness in people who have diabetes

WHO IS AT RISK FOR DIABETIC RETINOPATHY?

- Anyone living with any kind of diabetes
- Women with diabetes who become pregnant and women who develop gestational diabetes
- Poor control of your blood sugar level
- High blood pressure
- High cholesterol
- Tobacco use
- Ethnicity
- Risk increases the longer someone has diabetes

HOW OFTEN SHOULD I BE SCREENED FOR DIABETIC RETINOPATHY?

If you live with diabetes, you should be screened for diabetic retinopathy **EVERY YEAR**



EYE HEALTH SCREENING INITIATIVE:

Vision Loss Rehabilitation Canada, Indigenous Diabetes Health Circle and Kenora Chiefs Advisory are partnering to offer point of care diabetes retinopathy screening using either the:

OPTOMED CAMERA

or

DSRPLUS CAMERA



WHO CAN BE SCREENED:

- Anyone 18 years of age and older
- A diagnosis of diabetes is not required

REMEMBER:

- Diabetes doesn't necessarily lead to vision loss
- You can't always prevent diabetic retinopathy
- However, regular eye exams, good control of your blood sugar and blood pressure, and early intervention for vision problems can help prevent severe vision loss
- Annual screening is recommended

Screening is **not** a diagnosis of diabetes retinopathy; it identifies if there are any changes in the retina. It does not replace regular scheduled care with my Optometrist and/or Ophthalmologist.

WAIST CIRCUMFERENCE



Waist Circumference Risk	Measurement Men	Measurement Women
Low risk	Less than 94cm (37inches)	Less than 80 cm (31.5inches)
Increased risk	more than 94 cm (37 inches)	more than 80 cm (31.5 inches)
High risk	more than 102 cm (40 inches)	more than 88 cm (35 inches)

Waist measurement is a simple check to tell if you're carrying excess body fat around your middle. It is an indicator of the level of internal (visceral) fat deposits that coat the heart, kidneys, liver, digestive organs and pancreas. This can increase the risk of heart disease and stroke.

HOW TO MEASURE YOUR WAIST CIRCUMFERENCE:

- Find the top of your hip bone and the bottom of your ribs. The waist is the soft, narrow section between these bony landmarks, often slightly above the belly button
- Place the tape measure horizontally around your waist, keeping it level all the way around and loose enough to fit one finger inside the tape. Ensure it does not twist or dip at the back.
- Stand naturally
- Take a deep breath. Breathe out normally. Do not hold your breath
- Place the tape measure midway between these points, in line with your belly button, and wrap it around your waist loose enough to fit one finger inside the tape.
- Check your measurement.

A larger waist measurement can be linked to high cholesterol, blood pressure and increased risk for heart disease, stroke and type 2 diabetes.

DYSLIPIDEMIA (CHOLESTEROL)



DYSLIPIDEMIA: means having an unhealthy balance of lipids (fats) in your blood. Unbalanced levels can build up as plaque in your arteries and raise your risk for heart disease and stroke.

Most adults with diabetes are at greater risk for cardiovascular diseases, such as heart attack and stroke.

People with diabetes have an increased risk of cardiovascular diseases even if their LDL-cholesterol is “normal”. They have an even higher risk if their LDL-cholesterol is elevated.

CHOLESTEROL is a fat found in the blood. There are two main types of blood cholesterol: high density (HDL) cholesterol and low density (LDL) cholesterol.

- HDL cholesterol is referred to as ‘good’ cholesterol because it helps to remove excess cholesterol from the body.
- LDL or “bad” cholesterol clogs your blood vessels, filling them with plaque that causes

Always discuss your cholesterol results with your physician or nurse practitioner and other members of your health-care team.

HOW OFTEN SHOULD I GET MY LIPID PANEL CHECKED?

- Lipid panel should be done at time of diabetes diagnosis and then **EVERY YEAR**
- If treatment is required, frequency of testing may increase
- Fasting (nothing to eat or drink for 8 hours before blood work) is preferred

HEALTHY LEVELS OF CHOLESTEROL IN BLOOD

<u>Type of cholesterol</u>	<u>Healthy concentration (blood levels)</u>
LDL cholesterol (bad)	Healthy to have a low number Less than 2.0mmol/L
HDL cholesterol (good)	Healthy to have a high number Higher than 1.0mmol/L
Total cholesterol	Healthy to have a low number Less than 4.0mmol/L
Triglycerides	Healthy to have a low number Less than 1.7mmol/L

HOW CAN I IMPROVE MY HEART HEALTH?

Healthy lifestyle choices can improve overall health and support diabetes management:

- Maintain a healthy weight
- Live an active lifestyle
- Nourish your body. Limit processed, salty, trans fatty acids, refined carbohydrates and sugary drinks
- Use alcohol in moderation
- Avoid, reduce or quit commercial tobacco
- Eat a balanced nutritious diet

Screening frequency may be different based on your personal health as determined by your primary care provider.

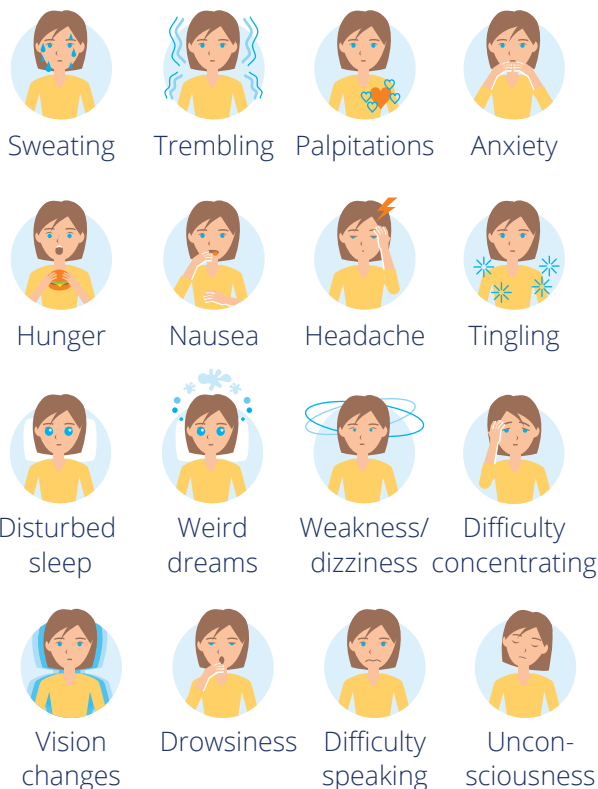
Hypoglycemia low blood sugar in adults

What are the signs?

Blood sugar below 3.9 is considered low. Each person will have their own way of recognizing low blood sugar.

Some of the signs include:

Severity



Why does low blood sugar happen?

Have you:

- Eaten less than planned?
- Eaten later than normal?
- Taken more medication than planned?
- Been more active than planned?
- Drunk any alcohol within the past 24 hours?

Fear of lows is common and may cause excess anxiety, stress, reducing the ability to function and quality of life. If you are having lows, speak with your diabetes health-care team:

- Doctor • Nurse practitioner • Pharmacist
- Nurse • Dietitian

How to take action

If able to swallow, **EAT 15 g fast-acting sugar**



15 g of glucose in the form of glucose tablets



1 tablespoon (15 mL) of honey



1 tablespoon (15 mL) sugar in water



1/2 cup (125 mL) of juice or regular soft drink



15 g fast-acting sugar (e.g. 4 Life Savers® or 2 rolls Rocket Candy)

With more severe signs (affecting mental/physical ability):

- If able to swallow → EAT 20g fast-acting sugar
- If unable to swallow → GIVE 3 mg glucagon intranasal or 1 mg SC/IM



WAIT 15 minutes and **CHECK**



If blood sugar is 3.9 mmol/L or **ABOVE** **AND** next meal is **in the hour**



If blood sugar is 3.9 mmol/L or **ABOVE** **AND** next meal is **LONGER than 1 hour away**

If blood sugar is **BELOW** 3.9 mmol/L **REPEAT** steps above



Eat ONE of:
Starch:

ex. 7 crackers OR 1 slice of bread

AND

Protein:

ex. 1 piece of cheese OR 2 tablespoons of peanut butter



Are you Driving?

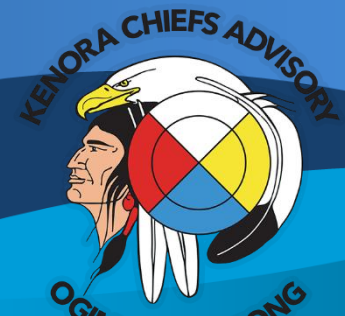
After treating a low, **Wait** until your blood sugar is above 5 mmol/L to start driving. Your brain might need up to 40 minutes to recover before you can safely drive again.

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DIABETES
CANADA

PERIPHERAL ARTERY DISEASE (PAD)



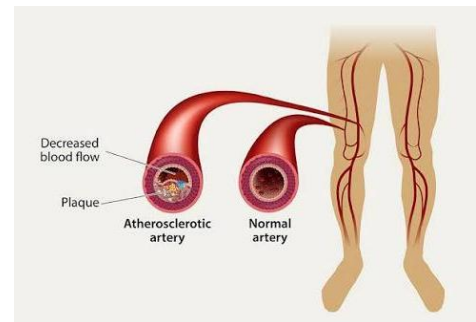
What is PAD

PAD is a blockage in the arteries supplying blood to the legs (poor circulation).

The cause of the blockage is atherosclerosis or "hardening" of the arteries. This is the same disease that can cause heart attacks and strokes but PAD affects the arteries of the legs.

Atherosclerosis occurs in the legs related to:

- smoking,
- diabetes,
- high blood pressure,
- elevated cholesterol,
- aging and
- heredity.



Many people who have PAD don't have any symptoms. As it progresses, you may develop weak or tired legs, have trouble walking or balancing or pain with exercise. When PAD is more severe there is pain even at rest and at night (usually in the foot). Skin breakdown (ulcer) or dead tissues (gangrene) can occur at this point.

How is PAD diagnosed:

If you have PAD, the pulse in the affected area may be weak or missing. Your doctor will check the pulse and blood pressure in different areas of your body and may also look at the colour of your foot when it is raised up and after you exercise.

Some possible tests may include:

- **Blood work:** to check for things that increase the risk of PAD, such as high cholesterol and high blood sugar.
- **Ankle-brachial index (ABI):** compares the blood pressure in the ankle with the blood pressure in the arm.
- **Ultrasound of the legs or feet.** Images of how blood moves through the blood vessels of the legs or feet and spot blocked or narrowed arteries.
- **Angiography:** uses a dye to look for blockages in the arteries.

Lifestyle changes can help improve symptoms:

- If you use commercial tobacco products, quit or cut down
- Live an active lifestyle
- Eat a nutritious diet.
- Manage diabetes to keep sugar in range
- Monitor Blood Pressure

Take good care of your feet and legs:

It's important to take good care of your feet. PAD with diabetes can make it harder for cuts and sores on the lower legs and feet to heal. Foot care tips:

- Wash your feet every day. Dry them completely.
- Use moisturizer on the feet to prevent cracks that can lead to infection. But don't moisturize between the toes. This can help fungus grow.
- Wear thick, dry socks and well-fitting shoes.
- Take care when trimming your toenails.
- Check your feet daily for cuts, sores or other injuries. See a healthcare professional if you find any.
- Have a foot doctor, called a podiatrist, treat bunions, corns or calluses.
- Treat wounds, cuts, and scrapes on your legs right away - Poor blood flow to the legs caused by PAD can keep wounds, cuts, and scrapes from healing right. Prompt treatment can help you avoid this problem.
- Avoid shoes that are too tight or that rub your feet.
- Avoid socks or stockings that are tight enough to leave elastic-band marks on your legs. They can make circulation problems and symptoms from PAD worse.



Have your primary care practitioner assess your legs and feet at least every year. Some people require more frequent assessment. See additional information specific to Diabetes and Foot Care

Diabetes and your feet

Diabetes can cause nerve damage (known as diabetes peripheral neuropathy) and poor blood flow or circulation to the legs and feet (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.

A good daily footcare routine can help keep your feet healthy:

- ✓ Examine your feet and legs daily
- ✓ Care for your nails regularly
- ✓ Apply moisturizing lotion if your feet are dry (but not between the toes)
- ✓ Wear properly fitting footwear
- ✓ Test your bath water with your hand before you step in, to make sure the water is not too hot

Foot problems are very common in people with diabetes and can lead to serious complications. A daily foot-care routine and good blood sugar control will help keep your feet healthy.

Daily foot care

Gather foot care supplies like nail clippers, a nail file, lotion, and a plastic hand mirror and keep them together. Having everything you need in one place makes it easier to follow this care routine every day.

- **WASH** your feet in warm (not hot) water, using gentle soap.
- **DRY** your feet carefully, especially between your toes.
- **ASSESS** your feet and between your toes for cuts, blisters or changes.
- **LOOK** in a hand mirror to see the bottom of your feet (or ask for help).
- **CLEAN** cuts or scratches with gentle soap and water, cover with bandage for sensitive skin.
- **TRIM** your toenails straight across, file sharp edges. Don't cut the nails too short.
- **APPLY** lotion to your heels and soles (not between toes). Wipe off excess lotion.
- **WEAR** clean socks and well-fitting shoes every day.



When to see your doctor

Have your bare feet checked by your doctor or a foot-care specialist (podiatrist, chiropodist or foot-care nurse) at least once a year or more often if you've been told you are high risk.

In addition, ask your doctor to screen you for nerve damage and poor blood flow in your feet at least once a year.

If you have any of the following, see your doctor or a foot-care specialist right away:

- swelling
- warmth, redness or pain in feet or legs
- corns (thick or hard skin on toes)
- calluses (thick skin on bottom) of feet,
- ingrown toenails
- warts
- slivers

Do not try to treat them yourself.



Best advice

DO	DON'T
Wear supportive, well-fitting shoes. They should have low heels (<5 cm high) and should not rub or pinch. Try to have a knowledgeable staff member measure you for the proper fit.	Don't go barefoot, even indoors. Consider buying a pair of well-fitting shoes that are just for indoors.
Buy shoes in the late afternoon (since your feet swell slightly by then).	Don't wear over-the-counter insoles. They can cause blisters if not fit properly.
Wear loose socks at night if your feet get cold.	Don't wear anything tight around your legs, such as tight socks or knee-highs.
Keep your feet clean and dry.	Don't overly soak feet or put lotion between your toes. Too much moisture can cause infection.
Elevate your feet when you are sitting.	Don't put hot water bottles or heating pads on your feet.
Wiggle your toes and move your ankles throughout the day to improve blood flow.	Don't sit or cross your legs for long periods of time.
Exercise regularly to improve circulation.	Don't smoke. It decreases circulation and healing and greatly increases the risks of amputation.
Inspect your feet daily and feel for skin temperature differences between your feet.	Don't use over-the-counter treatments for corns and warts. They are dangerous for people with diabetes.

For more information visit diabetes.ca

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