



## Diabetes

Diabetes presents very specific issues for amputees.

This article discusses concerns amputees may have related to Type 1 and Type 2 diabetes – including how to prevent diabetes, how to manage diabetes, and how to be especially careful if your amputation was due to diabetes or circulatory problems. Type 1 diabetes has additional concerns which are highlighted under **What is Diabetes?** Information presented here is to act only as a guide, please contact your doctor for specific advice for your situation.

Diabetes presents very specific issues for amputees. If you have an amputation not related to your diabetes (ex: due to an accident or if you are a congenital amputee), you need to try to minimize the effects diabetes has on your lifestyle, which is already affected by your amputation. For instance, if you are a lower-limb amputee, you need to take care of your residual limb **and** your sound leg – as both need to be in healthy condition in order for you to walk with your prosthesis.

If your amputation(s) was vascular- (blood vessels) or diabetes-related, however, you will need to take **extra** care to manage your diabetes to reduce the risk of additional health problems, and even another amputation. The health concerns that caused the amputation still remain, and you will need to actively make changes to your lifestyle.

An important concern for a leg amputee is that diabetes can lead to loss of protective sensation (sensory neuropathy). You may not feel an injury to your sound foot or leg or residual limb which, if untreated, can result in serious conditions such as ulcers. Monitoring your diabetes, developing a healthy lifestyle and taking care of your lower extremities will go a long way to help you manage your diabetes.

**Monitoring your diabetes, developing a healthy lifestyle and taking care of your lower extremities will go a long way to help you manage your diabetes.**

The good news is that more is known about diabetes than ever before to help people with diabetes control it better and live fuller lives. We will describe how to live well if you have diabetes, but first let's look at diabetes generally.

### What is Diabetes?

Diabetes is a metabolism abnormality that affects the way your body uses blood sugar (glucose), your main source of energy. There are two main types of diabetes. Type 1 (previously called juvenile diabetes) occurs when the pancreas is unable to produce insulin, the hormone needed by the body to process glucose properly.

It is usually diagnosed before the age of 30 and it's not clear why it occurs. Approximately 10 percent of people with diabetes have Type 1 and, in consultation with their doctor, need to monitor their blood glucose level and administer insulin each day.

The remaining 90 per cent of people with diabetes are affected by Type 2 (previously called adult-onset diabetes). Type 2 diabetes is largely health-related and preventable. It occurs when the body either does not produce enough insulin or does not effectively use insulin. Some people with Type 2 diabetes can control their diabetes through lifestyle changes and do not need to take insulin, while others may need to take insulin or other medications.



**Hyperglycemia (not enough insulin, causing a high level of sugar) or hypoglycemia (too much insulin, causing a low level of sugar) are diabetic emergencies that can be avoided by monitoring your diabetes carefully.**

## How Do I Know if I Have Diabetes?

The Canadian Diabetes Association estimates that 750,000 Canadians do not know they have diabetes. If you are over the age of 40, have a parent or sibling with diabetes, are of Aboriginal, Hispanic, Asian or African descent, gave birth to a baby that weighed over 9 lbs or have had gestational diabetes, you are at a higher risk of developing diabetes. Other high-risk groups include people who: are overweight, have high cholesterol and/or blood pressure, a high glucose level or heart disease.

The following are warning signs that you may have diabetes:

- Unusual and constant thirst
- Frequent urination
- Unexplained weight loss
- Blurred vision
- Frequent or recurring infections
- Tingling or numbness in hands or feet
- Slow healing of cuts and bruises
- Extreme fatigue or lack of energy

If you have any of the above symptoms, do not put off seeing your doctor – early diagnosis is extremely important in managing diabetes. Some people with Type 2 diabetes do not show any symptoms, so have regular medical check-ups and discuss with your doctor if you are in a high-risk group. If you do not have diabetes but have a high blood glucose level, the following information on developing a healthy lifestyle will also apply to you.

## Monitoring Your Diabetes

If you have diabetes, the first step is understanding how it affects you. Type 2 diabetes is closely associated with weight gain and physical inactivity, which means you can actively take steps to control and manage your diabetes.

Diabetes can often be managed and controlled through exercise, eating well and maintaining a regular weight.

People with Type 1 and some people with Type 2 (especially those

who have had Type 2 for a long time) will also need to take medication (ex: oral medication that helps increase the effectiveness of insulin absorption) and/or insulin. Various medications are available so you and your doctor can choose which type suits your lifestyle best. Make sure that you have your blood tests, blood pressure tests, kidney checks, and eye exams when prescribed as well. People with diabetes need to closely control their blood sugar levels. Having abnormal blood sugar levels over a long period can cause medical complications including eye and kidney problems. Another complication from high blood sugar levels is nerve damage, which can affect your heart rate and perspiration level. Nerve damage can even lead to a lower extremity amputation. This is also a very serious consequence for people who are already amputees, as you are dealing with reduced function or mobility already. You need to be careful, especially if your amputation was as a result of diabetes or circulatory



**Monitors can be used to check blood sugar levels.**

problems. To help prevent another amputation from happening, make sure your doctor explains, in clear terms that you understand, how to monitor your diabetes.

Diabetes Education Centres (located in major hospitals and in some community centres) are a great resource. Run by qualified professionals (ex: nurses and dietitians), they offer small group or individual information sessions on exercise and testing blood glucose levels. For those who are unable to leave their home, having a VON (Victoria Order of Nurses) nurse or member of a community home-care program provide teaching at home may be an option depending on the health-care program in your province. You will need to get a referral from your doctor for either of these services.

## Developing a Healthy Lifestyle

Living with diabetes involves balancing food, physical activity and medication to prevent complications. Smoking leads to poor circulation, so stopping smoking will greatly improve your circulation and health and is especially important if your amputation was diabetes- and/or vascular-related. If you do smoke, your doctor can help you develop a strategy to stop. Reducing your stress level will also help you manage diabetes better, since stress can cause higher blood glucose levels. Motivate yourself to start changing your lifestyle – every small positive change can lead to a healthier life.

## A Healthy Diet

Having a healthy diet does not mean that your diet has to be boring. Eating a variety of foods will help keep your diet interesting. Try to eat from at least three of the four food groups (starch, fruit and vegetables, milk and protein) at each meal. When eating meat or fish, choose to bake, BBQ or grill it rather than fry it. Increase high fibre foods (such as whole grains and cereals) in your daily diet, and reduce your general intake of sugar or use artificial sweeteners instead. You need to eat regularly to maintain



the right level of blood glucose, so eating three meals a day with light snacks in between (even when travelling and when at work) will help regulate this.

How much sugar you eat is also an important consideration. Fruit and fruit juice contain natural sugars that may cause your blood sugar level to increase, but can be eaten in limited quantities. If you are thirsty, sugar free soft drinks or water is a better choice than fruit juice, which is a concentrated source of sugar. Also, drinking alcohol (which contains high levels of sugar) and/or a large amount of coffee can raise blood sugar so discuss your consumption of these drinks with your doctor.

The Canadian Diabetes Association has recipes for people with diabetes that can help give you ideas for tasty and healthy meals as well as tips for eating out. A dietitian at a Diabetes Education Centre can also give you guidance and provide you with meal plans.

## Exercise

Research has shown that even a small amount of exercise helps control diabetes. Regular exercise is very effective in lowering blood sugar since when you exercise, your muscles pick up sugar more readily from your body. If you exercise regularly you may be able to reduce your dosage of insulin or oral medication (after consulting with your physician) and your chances of developing cardiovascular (heart and blood vessels) disease.

It is better to do a little bit of exercise daily, rather than an intensive workout once a week. You can be successful if you make changes slowly, one step at a time. Before you get started, see your doctor to discuss your individual needs, medical concerns and how your blood glucose level may be affected. This is especially important if you have Type 1 diabetes, as suddenly increasing the intensity of your workout may result in low blood glucose (hypoglycemia). Don't forget to test your blood glucose level before, during and after you exercise to make sure it is not too high or too low. Walking, jogging and bicycling are great exercises for people with diabetes. A partner and a regular schedule can help to keep you motivated. Walking on your lunch break at work, walking the dog or pushing your child or grandchild in a stroller are also great ideas. If you live in a city or town, walking or running groups, even mall-walking groups, are popular options.

**Remember, even a little activity will help lower your blood glucose and blood pressure, and improve your cardiovascular condition.**

## Taking Care of Your Lower Extremities

There are two concerns that people with diabetes need to be careful of when it comes to their lower extremities: numbness or lack of sensation in their limbs (neuropathy), and/or poor circulation. Neuropathy means you may not be able to feel hot or cold, or pain from an injury in your sound foot or residual limb. Since no pain is felt, you may not notice the injury immediately – so a small problem like a cut from a pebble or an ill-fitting prosthesis, if unnoticed, can lead to an ulcer. As well, people with diabetes (including young children) have stiffer joints; this lack of flexibility can cause pressure points and increase the chance of developing ulcers. If an ulcer is not discovered in time and becomes infected, it can be difficult to treat and may even lead to amputation.

Poor circulation in your feet and legs, which is common among people with diabetes and vascular problems, can slow down the healing process as well. You can improve your circulation by keeping the blood flowing to your feet, by wiggling your toes for five minutes and moving your ankles up and down a few times a day for instance. Avoid crossing your legs for long periods of time.

Amputees with diabetes have to pay close attention to their residual and sound limbs in order to prevent diabetic complications and to avoid the necessity of further amputation. Two-thirds of amputation in people with diabetes can be prevented by proper foot care! Have your prosthetist, physiotherapist or any member of your health care team check your foot and residual limb at every visit and use this self-check list daily:

- Check your sound foot and residual limb for sores, cuts, blisters or other problems every day. Check your shoes for pebbles and foreign objects.
- Wash your foot/feet in warm, not hot, water. Dry it well, especially between the toes.
- Trim toenails straight across.



If you have a high amputation or if you do not have a lot of feeling in your sound foot, there are other activities you can do instead of walking – like swimming and strength-training for example. If you are not very mobile and/or out of shape, lower-intensity exercises are a good option. For example, people of all ages

and activity levels can enjoy the benefits of aqua fitness, yoga and tai chi. Stretching for a few minutes each day, or doing chair aerobics, will help increase circulation and make your body feel less stiff. Being active does not have to mean doing high-energy sports, more leisurely activities such as golf or gardening are also great.

Remember, even a little activity will help lower your blood glucose and blood pressure, and improve your cardiovascular condition. Adjustments to your daily routine eventually become habits and help you stay healthy.

## Weight Control

Maintaining a consistent and healthy weight will greatly reduce your chances of developing diabetes complications. How much you eat, as well as what you eat, makes a difference. If you are overweight, a 10-20 pound weight loss is often enough to improve your blood sugar level. If you would like to lose weight, the most effective way is to combine good nutrition and regular exercise. Your doctor and/or dietitian can recommend a program that fits best into your lifestyle and activities. If weight loss is recommended to help manage your diabetes you will also need to discuss this with your prosthetist as you may need adjustments to your socket, to allow for weight loss in your residual limb.

- Protect your foot/feet from extreme hot or cold. If you are cold at night, wear socks.
- Never use heating pads or hot water to warm your foot/feet.
- Never go barefoot. Wear slippers or socks inside the house.
- Always wear your prosthesis or use a mobility aid. Hopping on your sound foot can lead to injury from overuse or by stubbing your toes or falling.
- Wear a waterproof leg (like a swim leg) at the beach or in the pool, and even for standing in the shower. If you are getting up to go to the bathroom at night and do not want to put your prosthesis on, use crutches for balance.
- Wear water shoes on the beach, on a deck and around the pool to protect your sound foot from hot temperatures on wood, tiles and sand.



**Once ulcers develop they can be difficult to treat.**

Your self-check should also include the skin on your residual limb – keeping it clean and dry, making sure there are no pressure points caused by the socket, and washing your socket and stump socks or liners daily to prevent bacteria from growing. A useful tool during these self-checks are diabetic foot care kits, which contain a mirror to see the underside of the foot and a

foot brush to apply medication to hard-to-reach areas. While amputees can perform basic nail care themselves, they should see a specialist (like a podiatrist or a pedorthist) for treating calluses and bunions. Podiatrists diagnose and treat disorders and injuries of the foot and lower leg to keep this part of the body working properly and allow you to remain mobile. He/she can perform preventative foot care like removing calluses and treat any problem (by wound treatments and casts for example) to prevent the need for surgery. A pedorthist specializes in foot care and the proper fitting of shoes and orthoses. A pedorthist or an orthotist can design custom-fitting shoes to prevent pressure areas from developing, and other devices, such as a patellar tendon bearing knee brace, to relieve pressures on the foot. If you notice any changes with your foot or residual limb (like red areas or sores) that persist after a few days, visit your doctor to have them treated. If you are already being monitored for diabetes, report any sores to your doctor as soon as you notice them. If you have an open wound like an ulcer, do not try to take care of it yourself – see your doctor immediately for treatment. Ulcers may not be treatable once they become deep rooted and can result in amputation.

If the open wound becomes infected you will probably need medication to cure it. Skin problems in either your residual limb or your sound foot may require that you stay off your foot (technically “off-weighting”) until the problem is resolved. You may need to use mobility aids like walkers and wheelchairs for certain periods as well during this time.

Proper footwear is an important, but often overlooked, consideration. It is essential for lower limb amputees to have shoes that provide enough cushioning and are comfortable. Make sure your shoes fit well; that they are wide enough across the toes and do not restrict circulation. This is especially applicable for women, since many women’s shoes sacrifice comfort and proper fitting for fashion. Shoes need to be at the right heel height for the alignment of the prosthesis, and should be replaced when they become worn. Shoes should be made of materials that will stretch, like leather. Running shoes are a popular choice.

### Diabetic foot care kit



Photo: Patterson Medical



Also, wearing socks that are seam-free (often called diabetic/circulation socks) will help improve circulation to your sound foot and lower your chances of getting a friction abrasion – a seam in the sock can often rub and cause minor abrasions or blisters, especially if walking for extended periods.

## Your Prosthesis

There are a few things for amputees with diabetes to pay specific attention to with regards to their prosthesis. The most important part of your prosthesis is your socket. If your socket is uncomfortable, you will not want to use your prosthesis. Your prosthetist can ensure that it fits well and does not restrict circulation. Flexible total-contact sockets are a good choice for amputees with diabetes since they reduce discomfort and swelling in the residual limb. Silicone and urethane gel sockets and liners are a fairly recent innovation that can make the prosthesis comfortable to wear. The layer of cushioning they provide can help reduce skin irritations and help the amputee tolerate forces within a socket.

A lightweight prosthesis means that you expend less energy when walking than with a heavier one – this can help you keep active. Choosing the prosthetic foot appropriate to your activity level is also important. Elastic keel feet are good for general walking as they are lightweight. There are now feet made specifically for seniors (like Endolite’s Senior Foot and Ottobock’s Geriatric Lightfoot) that have a flexible keel and are lightweight, but other standard prosthetic feet are suitable as well. Dynamic response feet (which are known also as energy-storing) and carbon fibre feet are a



Silicone gel liners

good choice if you have an active lifestyle as their spring mechanism helps you use less energy.

Having a “good gait” facilitates an active lifestyle. If it has been a long time since you have had gait training, you may want to consider visiting your prosthetist or physiotherapist to check if you have developed bad habits. They can make sure that you are not putting additional strain on your residual limb or sound foot and that you are walking as well as possible, so that you can keep mobile.

## A Guide to Managing Diabetes

Today, there is a great amount of information available as well as specially-trained health professionals to help people manage their diabetes. Having a healthy lifestyle and taking care of your lower extremities are very important for amputees with diabetes to help minimize the complications of diabetes and the impact it has on your overall lifestyle.



**Medical alert bracelets or necklaces warn medical personnel that you are diabetic.**

## Organizations of Interest

### 1. Canadian Diabetes Association

The leading source of information on diabetes in Canada.

Toll-free **1-800-226-8464**

**[www.diabetes.ca](http://www.diabetes.ca)**

### 2. Juvenile Diabetes Research Foundation of Canada

Deals with issues geared towards children with diabetes and their families.

Toll-free **1-877-287-3533**

**[www.jdrf.ca](http://www.jdrf.ca)**