



Diabetes and Spinal Cord Injury: Prevention and Treatment

Long term spinal cord injury (SCI) and diabetes? Some research suggests the two go hand in hand with as many as 20% of spinal cord injured people having adult-onset diabetes. If you have an SCI, what should you know about diabetes?

What is Diabetes?

Diabetes is a chronic disease in which the body does not make enough insulin – a hormone from the pancreas – **or**, does not use the body's insulin correctly. As a result, glucose or blood sugar that is normally carried to the body's cells for fuel, instead builds up in the bloodstream. This extra glucose – called high blood sugar – can damage all organs of the body, especially the heart, eyes, kidneys, nerves, and blood vessels. There are two types of Diabetes:

Type 1 Diabetes

Type 1 (insulin-dependent) diabetes starts in childhood or young adulthood, and requires daily insulin injections. This type accounts for just 5% of the cases.

Type 2 Diabetes

Type 2 diabetes — which often is called adult-onset diabetes — usually occurs in adults over 40 and accounts for 95% of all diabetes cases. This type is of most concern to SCI survivors. While it usually can be controlled through diet and exercise, some people may need oral medications or insulin injections.

Am I at Risk?

It's estimated that of the **25.8 million** people in the United States that have diabetes, **7 million** of these individuals (almost one-third) don't know they have it! (ADA, 2011). Symptoms of diabetes can be hard to spot because some of them can be confused for other illnesses or conditions.

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Common symptoms include:

- Dehydration
- Excessive urination
- Extreme thirst
- Increased appetite
- Weight change

For people with spinal cord injury however, recognizing these symptoms can be difficult because changes to the body after SCI may make it difficult to identify. For example, using a catheter may make it difficult to identify “excessive urination” and some of the other symptoms could be a side effect of certain medications.

It’s very important to understand that after a SCI the body may quickly lose muscle while gaining fat, especially if not physically active. This is enough to change metabolism and the way the body is able to use insulin. This change can put a person at greater risk for developing diabetes than before a spinal cord injury. Since recognizing symptoms early makes a big difference, speaking with your doctor about your risk for diabetes is important.

What are the Risk Factors?

By far the most important risk factor is age. 11.3% of the US population over 20 years old has diabetes (ADA, 2011). The older you get, the greater the chances of developing diabetes. Some researchers and clinicians—and more than a few survivors—feel that people with SCI age faster than non-disabled people. If aging *does* speed up after SCI, then diabetes may make its appearance sooner.

Other factors include:

- Family history of diabetes
- Being overweight or obese
- Inactivity or not enough exercise
- Ethnicity – diabetes is more common in African Americans, Latinos, and Asian Americans
- Gender – believe it or not, diabetes is more prevalent among women than men
- Age – Over the age of 45 it’s a good idea to be screened for diabetes as the risks increase with age
- Having pre-diabetes– a condition that usually leads to the development of diabetes within 10 years

Pre-Diabetes, Obesity and Diabetes – Make the Connection

Pre-diabetes shows no symptoms. Pre-diabetes is a condition where blood glucose levels are higher than normal, but not high enough to be diabetes. There are two tests performed to see if you have this condition:

- Fasting plasma glucose test (FPG) - During the FPG blood test your blood glucose level is measured after you have fasted for 8 hours. This test will show if you metabolize glucose correctly.
- Oral glucose tolerance test (OGTT) - With the OGTT, your blood glucose is measured after a fast and then again 2 hours after drinking a beverage with a large amount of glucose.

Being overweight or obese is directly linked to pre-diabetes. For people with SCI this is especially important. People with SCI often burn calories at a slower rate and lose muscle mass due to the paralysis. This not only could lead to diabetes, but to other secondary conditions like high cholesterol, coronary artery disease, and cardiovascular disease.

Prevention

Persons with pre-diabetes should follow the same recommendations as those for persons already diagnosed with diabetes. Through weight loss and physical activity, you can delay having diabetes and even bring your blood glucose levels back to normal. Talk to your doctor about other ways to lower your risk.

- Don't do crash diets! Instead make simple changes in your eating habits.
- Set a realistic weight-loss goal, such as losing 1 pound a week.
- Aim for at least 30 minutes a day of physical activity.

Diagnosis is fairly simple, and is often the result of a routine urine or blood test. Fasting blood sugar tests are sometimes needed.

Treatment

Doctors treat diabetes by keeping blood glucose levels as close to normal as possible through diet, exercise, oral medications and, when necessary, added insulin. Other than working to lessen risk factors, there is no way to actually end the disease. But major improvement is possible and you play the key role.

If you have diabetes, get involved in a good diabetes education program. Most people learn to check their own blood sugar levels and to adjust their diet, exercise, and insulin doses. They can also read their body's built-in warning signs or symptoms of changes in the insulin glucose balance. Your health care team can help you learn these things or refer you to a diabetic education session and suggest other educational materials. Check with your local hospital as they may have a nurse educator who specializes in diabetes education, and printed information is easily found in libraries or through your local diabetes association.

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Diet

Diets are custom-tailored for each individual, based on gender, activity level, disease progression and physician philosophy on how precisely blood sugar levels should be controlled. They should be followed carefully. If you have a friend with diabetes, **do not** assume his or her diet will work for you.

Regardless of whether or not you must follow a strict diet, there are some general dietary guidelines:

- Always eat at a regular time; avoid skipping meals.
- Keep healthy snacks handy to avoid hunger and high glucose levels.
- Avoid sweets and desserts.
- Limit fats—especially saturated ones—in order to minimize the risk of circulatory complications.
- Limit alcohol consumption.
- High fiber diets help decrease glucose levels.
- Choose water over diet or other calorie-free drinks (artificial sweeteners can often act like real sugar on glucose levels).

Exercise

Exercise and physical activity help. When aerobic capacity improves, so does glucose tolerance. Exercise and physical activity help, but with a SCI this can be difficult. Work with your doctor or healthcare team to create a physical activity plan right for you. A routine exercise plan can help you cope with stressors, which can aggravate diabetes.

Sleep Well

Recent studies have shown that sleep plays a key role in controlling your weight. Taking multiple medications, busy schedules, and other daily routines can make it tough to get enough sleep. If possible, adjust your busy schedule to allow for enough sleep.

Avoid Complications

Be especially careful in watching for complications. Most complications involve the circulatory system (veins and arteries). Problems with circulation can create eye or vision changes and heart problems. Regular vision checkups and monitoring your heart rate and blood pressure are crucial.

Not enough circulation to the legs and feet can also cause complications. Watch your skin closely. Foot care is vital – wear loose socks, soft shoes that fit well, and keep your nails trimmed. Danger signs: skin

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breakdown that won't heal, changes in the color and texture of your toes, and swelling in the ankles. Don't ignore these problems. If they go untreated, your legs or feet may need to be amputated.

Exercise, infection, and fever can affect metabolism and insulin needs. Changes in diabetes treatment may be needed if you get sick or start a new exercise program. Learn how to plan for and respond to these changes.

Some researchers feel that stress aggravates diabetes. Find ways to relax, such as hobbies, vacations, relaxation tapes, or—best of all—start that physical activity program.

Finding Help

Look for professionals who understand SCI as well as diabetes, starting with your SCI center. If you can't find one doctor well versed in both issues, find two who are willing to work together. Your ultimate resource, though, is yourself. Learn as much as you can. Take control of your care and speak up for yourself. You can take responsibility by following your doctor's recommendations: learn to check your own glucose levels, take prescribed insulin/medication, adjust your diet, and exercise.

Parting Thoughts

Yes, there probably is a higher incidence of diabetes among SCI survivors. But many of the reasons for the increase are as much from how SCI affects your lifestyle – through diet, weight gain, and decreased activity – as they are from the actual physiological change. Because SCI survivors have the same causes and risks as non-disabled people, they can benefit from the same lifestyle changes such as a regular low-fat, high-fiber diet, weight reduction, regular exercise, and stress management.

- Diabetes is caused by a combination of genetic and lifestyle factors including being overweight.
- Persons with SCI are at much higher risk for developing diabetes because of decreased activity, weight gain, and metabolism changes after a spinal cord injury.
- Nutrition, exercise, and weight loss are the three keys to preventing diabetes.
- Careful management of diabetes generally has excellent results!

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