2008 Ss Science in Society

a NORTHWESTERN UNIVERSITY outreach initiative connecting science to the community

- HOME
- ARTICLES
  - FEATURE ARTICLES
  - MEDILL REPORTS
  - RESEARCH DIGEST
- BLOG
- EVENTS
- TOPICS
- MULTIMEDIA
- OUTREACH AT NU
- ABOUT US
- STAY CONNECTED

Search Site

Search Blog

Sign up for our monthly newsletter!

Like us on Facebook

twitter

NORTHWESTERN UNIVERSITY RESEARCH

TYPE 1 TODAY – DIABETICS GAIN CONTROL WITH NEW RESEARCH AND TECHNOLOGY

BY Marguerite McNeal; Zara Husaini | 21 Mar 2012

RELATED TOPICS
- Medicine/Health

Do you know exactly how many carbs you ate for lunch, how fast your blood sugar drops when you run a couple of miles, or how much insulin your body needs to digest that slice of pizza?

If you're one of the 3 million Americans living with Type 1 diabetes, these are the kinds of questions you ask yourself every day.

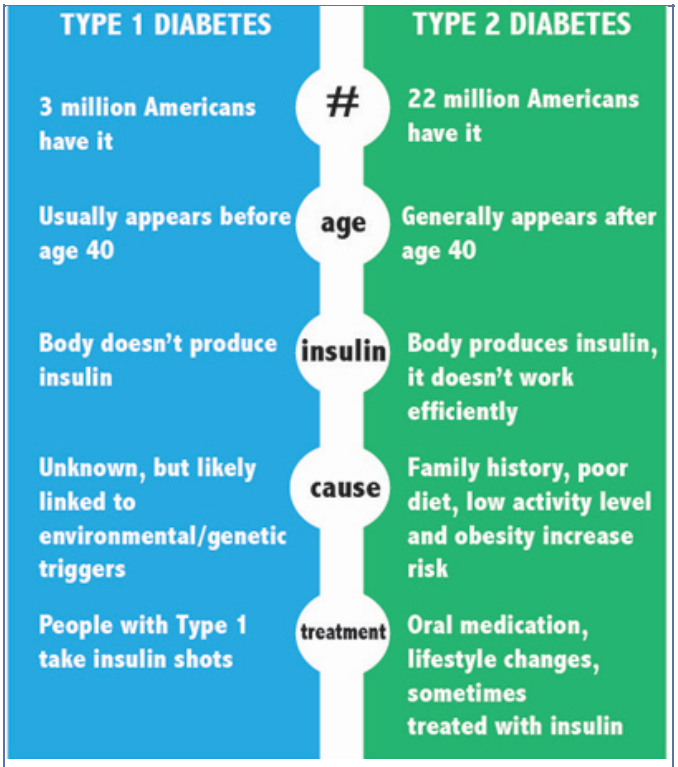
Diabetics are living longer, healthier lives with the help of new technologies, such as continuous glucose monitoring systems, and social networks and support groups. Managing the disease still poses challenges for Type 1 diabetics, though.

Cecil Ward, 19, a sophomore at the University of Mississippi, checks his blood sugar eight to 10 times and takes six to eight shots of insulin every day. He was diagnosed when he was 3 years old. That's typical in Type 1 diabetes, an autoimmune disorder, while Type 2 diabetes occurs later in life.

"There are times when I get frustrated," he said. "Diabetes comes with a lot of responsibility, but it is definitely not something that is impossible to take care of."

Of the 26 million Americans living with diabetes, 5 percent have Type 1, according to the American Diabetes Association.

As a result, people with Type 1 are often confused with Type 2 diabetics, although the two diseases have different symptoms, diagnoses and treatments.



(Courtesy of Marguerite McNeal/Medill)

"I wish they would call Type 1 something else," said Kimberly Webb, a nurse at Northwestern Medical Faculty Foundation, who said she is frustrated that people confuse Type 1 and Type 2 diabetes.

What's the difference?

The occurrence of Type 1 diabetes has nothing to do with diet or lifestyle – two factors associated with the onset of Type 2. Also referred to as juvenile or insulin-dependent diabetes, Type 1 is an autoimmune disease in which a person's pancreas stops producing insulin, the hormone that regulates carbohydrate and fat metabolism and allows you to get energy from food.

Most people are diagnosed as children or young adults. There is currently no way to prevent – or cure – Type 1.

People with Type 2 diabetes still produce insulin, it's just less efficient at moving sugar out of the bloodstream. They are generally diagnosed at an older age and control their symptoms with diet, exercise, weight loss and sometimes medications. Their condition may be related to family history, other illness or obesity.

Until the last century, a diagnosis of Type 1 was a death sentence. In 1921, researchers from Toronto discovered insulin's role in the body, leading to a Nobel Prize and one of the most important advancements in modern medicine.

Since people with Type 1 don't produce insulin, they deliver it through syringes and insulin pumps, usually four or more times a day, depending on what they eat and their blood sugar level.

Day-to-day care

Life on this perpetual balance beam can be frustrating day after day.

"Having diabetes just forces me to keep an eye out on my blood sugar at all times throughout the day," said Ward. "I take my kit and insulin with me to all my classes and everywhere that I go, just in case I need to check my sugar and take some insulin."

He takes individual insulin injections, but other Type 1 diabetics choose to wear a pump – a device that is attached to the body and delivers insulin through a tubing system.

Even with constant attention, individuals still run the risk of dangerous high or low blood sugar levels, both of which can be life-threatening.

"You always need to be understanding, checking blood sugars, and reacting to exercise, stress, pregnancy, depression, surgery – all these have very different effects in people with Type 1," said Dr. Grazia Aleppo, who specializes in endocrinology and internal medicine at the Northwestern Medical Faculty Foundation. "The challenges are many."

Despite the setbacks, people with Type 1 are living longer, healthier lives.

Developments in healthcare

Many of Aleppo's patients wear continuous glucose monitoring sensors to gain better control over their blood sugars, she said.

The sensors, first introduced for home use six years ago, estimate blood sugar levels via a tiny wire inserted into tissue just under the skin's surface. The wire is about the size of two eyelashes and the sensor sends information to a remote monitor every five minutes, according to Tim Palmer, Chicago representative for Dexcom, a company that manufactures sensors. The sensors need to be replaced weekly and users can do that for themselves at home.

"It gives you information on the trend and speed of what your sugars are," Palmer said.

With traditional glucometers, diabetics can only test their blood sugar at one point in time and cannot tell if it is rapidly changing. The sensors allow them to see which direction their blood sugar is heading so they can prevent dangerous lows and highs before they happen.

Sensors aren't as accurate as glucose meters and patients who wear a sensor still have to check their blood sugar with the traditional meter to calibrate the sensor, according to Palmer.

"It doesn't change the nature of diabetes and it doesn't replace ownership," he said, adding that people with sensors have to reflect on the data they receive using software tools. "The individual who uses it has to want to use it."

Knowledge is power

While Type 1s are learning more than ever about their daily patterns, healthcare professionals want to know more about their patients.

The T1D Exchange is an ongoing study that collects patient information for researchers, patients, clinicians and industry workers to better understand the disease. Funded by the Leona M. and Harry B. Helmsley Charitable Trust, the registry encompasses pediatrics and adult endocrinology.

At one of 67 centers participating in the study, Aleppo said she wants to determine more of the basic characteristics of people with Type 1 diabetes and hopes the survey will give the public more knowledge about the disease.

Dr. Grazia Aleppo explains how the T1D Exchange helps diabetics and their doctors.

How did you become involved in the Type 1 Diabetes Exchange?

We were chosen to participate because we have a large number of adult patients with Type 1.

Right now we have 25,000 patients with type 1 diabetes enrolled – adults and children – in 67 centers across the U.S. We're already identifying a lot of information. For example when children are diagnosed we see whether they are Caucasian, Asian or Hispanic, or if they have any siblings who have Type 1.

Why is it important to have more information about adults with T1D?

There are many adults now who are getting older and older successfully with Type 1, but nobody knows who they are. The last time they were checked, they were enrolled in a trial that started in 1985 and was published in 1993. But that was the only research that worked on Type 1 in terms of an outcome study.

In the past, many institutions did not care about adults with Type 1. Now they are changing their vision and approach because the disease becomes even more challenging when you become a teenager, a college student, a married person, and so on. Then the burden is all yours. Your family is not there to give you shots or check your blood sugar. You need to be able to handle the condition to have a successful life, which we all believe should be no problem.

What information does the study gather?

We look at what type of therapy they do, whether it's injections, insulin pumps and sensors. And we're looking at complications. What are the complication rates – kidney disease, eye disease, neuropathy, heart disease, high cholesterol, for example.

The purpose of the T1D exchange is to develop the registry and say, ok, what are the needs that should be studied on these patients? Whatever the age may be.

When we know what their basic characteristics are, then we can make an intervention trial.

How will the T1D Exchange help people who don't have diabetes understand the difference between Type 1 and Type 2?

We're trying to make people understand they are not the same diseases, and this is a matter of education. Many people don't understand that Type 1 cannot be stopped – at least yet. Not with diet and exercise.

There's a lot of misunderstanding in the population so I hope this study will help with awareness. The more people who know, the better.

ASK AN EXPERT

Have a question about this article? Submit it here to SiS. Answers to select questions will be posted on the site.

COMMENT AND SHARE