

# “SURE I HAVE DIABETES, SO WHAT?”

**Lori D. Berard , RN, CCRC  
Nurse Manager, Diabetes Research Group/HSC  
Winnipeg, MB, Canada**



**Abstract:** *As the rate of diagnosis of diabetes rapidly increases, ongoing clinical research in diabetes will become increasingly important. This article provides a review of Type 1 and Type 2 diabetes, discusses the unique challenges and benefits of conducting research in diabetes, and defines the role of people living with diabetes who participate in clinical research studies. Strategies for successful participation in diabetes clinical research protocols are reviewed. The future direction of diabetes research is explored.*

In Canada, 2.25 million people — 5% to 10% of the population — have diabetes. An additional estimated 1.12 million people have undiagnosed diabetes. The disease currently costs approximately \$9 billion per year. By 2010, three million Canadians will have diabetes.

In the United States, 16 million people — 5.9% of the population — have diabetes; 5 million of these people are undiagnosed. The disease currently costs approximately \$98 billion per year. Each day, approximately 2,200 Americans are diagnosed with diabetes.

Table 1 provides a brief overview of Type 1 and Type 2 diabetes. The Nurses' Health Study included an analysis of risk for Type 2 diabetes that excluded all risk factors except weight. The researchers found that, as body mass index increased, so did the incidence of diabetes. Women with a body mass index (BMI) greater than 35 (healthy BMI is 20 to 25) had a 90% incidence of diabetes.

Obesity is becoming an epidemic worldwide. In Canada, 31% of males and 27% of females under the age of 18 are obese. Diabetes runs

<b>TABLE 1 Overview of Type 1 and Type 2 Diabetes</b>	
<b>Type 1 Diabetes</b>	
<ul style="list-style-type: none"><li>• Absolute lack of insulin production</li><li>• Insulin therapy required for life</li><li>• Usually occurs before age 30</li><li>• Risk in the general public is 1 in 400 to 1 in 1,000</li><li>• Risk in first degree relatives is 1 in 20 to 1 in 50</li><li>• Result of combination of risk genes and an environmental trigger</li><li>• 5% to 10% of diagnosed cases</li></ul>	
<b>Type 2 Diabetes</b>	
<ul style="list-style-type: none"><li>• Insulin resistance and/or insulin deficiency</li><li>• Treatment strategy varies: diet/exercise and plus or minus oral agents and/or insulin</li><li>• Used to be thought to be the disease of the old, overweight, and sedentary</li><li>• BUT: hereditary plays a major role and environment is a huge component of Type 2 diabetes</li><li>• Offspring have about a 50% chance of getting Type 2 diabetes</li><li>• 90% to 95% of all diagnosed cases</li><li>• 50% of people with diabetes have one complication at diagnosis</li></ul>	

rampant in certain cultural and racial populations. In Canada, among the Aboriginal population, 25% of those who live past the age of 65 who are screened have diabetes. This statistic is similar for Hispanics, Pima Indians, and in some instances, African Americans. As these groups live longer, we will see more diabetes.

In Manitoba, we will have about a 1 in 4 incidence of diabetes in a few years, partly due to our Aboriginal population. We are also finding Type 2 diabetes in children, primarily Aboriginal children, but also in Pima Indians, Hispanics, and African Americans.

Caucasian children are also being diagnosed with Type 2 diabetes due to obesity and family history. We conducted an obesity study in 20 children aged 12 to 16. Three of the Caucasian children had impaired glucose tolerance, which is the pre-diabetes states as recognized by the American Diabetes Association. Impaired glucose tolerance is a marker for Type 2 diabetes and it has the same risk factors for cardiovascular disease as it does for diabetes. Diagnosis of diabetes in children has increased since the late 1990s.

Diabetes is the leading cause of new blindness and end stage renal failure. Sixty-percent of people with diabetes will have symptoms of neuropathy. Forty-five to fifty percent of all non-traumatic lower limb amputations are related to diabetes — 70% of these are preventable. Cardiovascular disease is responsible for 80% of all deaths in diabetes. More women die from the cardiovascular disease due to diabetes than breast cancer, AIDS, and lupus combined.

Complications from diabetes include retinopathy, nephropathy, neuropathy, amputations, cardiovascular disease, impotence, and psychosocial problems. Patients most fear retinopathy. Nephropathy is the most costly complication to the health care system and the patient's health and quality of life. Neuropathy is excruciatingly painful and no treatments are available. Amputations are the most preventable complication, cardiovascular disease is the most deadly complication, impotence is the most secretive complication, and psychosocial problems are the most ignored complication.

#### **Benefits of Diabetes Research**

Benefits of diabetes research for people with diabetes include access to care; altruism; the research finding that the more often patients with diabetes saw a healthcare

<b>TABLE 2</b>
<b>The Challenges of Conducting Diabetes Research</b>
<ul style="list-style-type: none"> <li>• Multi-mechanism disease</li> <li>• Requires healthcare team approach</li> <li>• Progressive worsening of disease</li> <li>• Multiple complications — often multiple health problems</li> <li>• High morbidity and mortality</li> <li>• When people are first diagnosed with diabetes, they do not feel unwell — compliance with therapy is often an issue</li> <li>• Until recently, there was little activity in this therapeutic area</li> <li>• Few pharmaceutical companies have interest and experience in diabetes</li> <li>• NOW, there are many “me too” drugs</li> <li>• Many failed trials with complication prevention</li> <li>• Diabetes is an expensive disease that requires more for the standard of care to be met</li> <li>• There is a large population that is not interested in research</li> <li>• People with diabetes have a fatalistic approach</li> <li>• People with diabetes do not want to do more work: testing, recording, and exercise</li> <li>• People with diabetes do not want to lose weight</li> </ul>

provider, the better they did; and access to the many resources required to deal with a multi-system disease. Most of our patients are recruited through advertising and have never seen a diabetes educator. Seventy percent of all people in Canada with diabetes have never received any diabetes education.

Altruistic reasons for participating in research are to help the next generation, since there is a high familial occurrence of diabetes, and because participants receive better treatment and prevent complications. Two landmark studies conducted in diabetes — the Diabetes Control and Complications Trial in people with Type 1 diabetes, and the Untied Kingdom Prospective Diabetes Study in people with Type 2 diabetes — found that the more often patients with diabetes saw a healthcare provider, the better they did.

Diabetes is multi-system involvement in two ways: multi-body system and multi-healthcare system, because it involves so many areas of the body. Most people with diabetes are probably seeing an ophthalmologist, a cardiologist, an endocrinologist, a diabetes nurse educator, a social worker,

a dietician, and physicians for whatever complications they have.

Other benefits of participating in diabetes research are early detection of complications, high standards of clinical care, access to continually improving tools to manage diabetes, ongoing education and assessment, free supplies, social outings, and support.

#### **Challenges of Diabetes Research**

Table 2 outlines the many challenges of conducting diabetes research. Diabetes is a multi-mechanism disease that requires a healthcare team approach. Diabetes always gets worse. We must work as hard as possible to slow the progression of the disease. There are multiple complications related to diabetes and often multiple health problems. People with diabetes are not clean-cut solely hypertensive patients going into a nice clean-cut study.

There are high morbidity and mortality rates among people with diabetes. We are doing a long-term, eight-year, study looking at cardiovascular endpoints in people with Type 2 diabetes. I have no projection about how many of our patients will die during that period.

When people are first diagnosed with diabetes, they do not feel sick. There is no marker of diabetes, except that people go to the bathroom more frequently or their eyes are a little blurry and someone told them they need a new prescription. It is difficult to convince people with diabetes that they must do something about their disease.

Until recently, there was little activity in this therapeutic area and few pharmaceutical companies had interest in and/or experience with diabetes. We worked primarily with the insulin companies. Now, more companies want a piece of the diabetes pie. There are many “me too” drugs. Companies in other therapeutic areas, such as cardiovascular disease, are now getting involved in diabetes, because of the recognition that diabetes is a multi-mechanism disease.

The importance of diabetes was only recognized in the last decade. Many past trials to prevent complications failed. We are not getting to the heart of the endothelial problem that causes most diabetes complications. When we tell patients that we have another study, for example, in neuropathy, they are not interested.

Diabetes is a very expensive disease, no matter where you live. It requires more for the standard of care to be met. Our team of researchers includes dietitians, respiratory therapists, nurses, endocrinologists, nephrologists, cardiologists, and an internist.

People with diabetes comprise a large population, many of whom are not interested in research and do not care that they have diabetes. Many have a fatalist approach and do not understand the seriousness of their disease. People with diabetes are required to do more work in a clinical trial than the average research patient. They must do home blood glucose

testing and recording and exercise. We also want them to be compliant with their food, and write down what they eat. We encourage weight loss.

### **The Role of People with Diabetes in Research**

People with diabetes play a very important role in managing research in diabetes. Diabetes is the only disease where the patients are truly the captains of the medical team. They determine whether they make the right choices every day. They must live with the consequences of those choices. I like being the navigator; guiding patients by helping them make the right choices and reinforcing good behavior.

Diabetes requires that people fit the disease into their lifestyle. We do not want them to adapt their lifestyle to fit the disease. Diabetes is about education. The more that people with diabetes are educated, the more they are empowered. There are many facets to diabetes and many guidelines, and many healthcare providers do not have enough time to manage the disease. We like to empower our patients to understand where they should be.

We encourage people with diabetes to take control of their lifestyle. We help them integrate all the tools — home blood glucose monitors

and micro albumin testers and other things — in their toolbox. There are many tools available, but if patients do not know how to use them and why they are using them, they will not be compliant.

### **Strategies for Successful Participation In Diabetes Research**

Table 3 outlines strategies for successful participation in diabetes research. We educate our patients about their disease from the beginning. Little light bulbs go on because they have had diabetes for 10 years but they have never seen a dietician, or nobody ever told them that there was a cell that would not let the insulin in to lower the blood sugar and that is why they are on this pill, or that their pancreas cannot make up enough insulin so that is why they are on that pill. All of a sudden, they start to put to put these little pieces together and they understand why they are on three different medications to manage their diabetes.

We also like to talk to patients about what they are trying to prevent. Many patients think they have “a little bit of diabetes.” When I tell them that 80% of all people with diabetes will die of cardiovascular disease, or that it is the leading cause of blindness, they may stop and think about the disease.

**TABLE 3**  
**Strategies for Successful Participation In Diabetes Research**

- Educate participants
- Recruit motivated participants
- Consider participants the most important member of the team
- Remember that diabetes is a chronic disease
- Build long-term relationships
- Be navigators who patients can reach
- Conduct population-based studies
- Recruit through diabetes education services
- Seek repeat participants
- Reimburse participants for their expenses
- Advertise
- Have a friendly/non-judgmental attitude
- Be supportive

We know that we need motivated participants, since we are asking them to do even more recording. We make the participants the most important members of the research team. For example, 99% of the time people with diabetes who participate in research must fast before an appointment, so we open at 7:00 a.m. so they can get to work in the morning and fast for the least possible amount of time.

Diabetes is a chronic disease, so we try to facilitate long-term relationships. We have multiple repeat participants. As navigators, we are accessible to our research participants. We have somebody on call 24 hours a day, 7 days a week, 52 weeks a year.

These are often population-based studies, so we try to recruit participants from the population. We recruit at diabetes education services and work with educators to encourage their patients to participate in research. We recruit through family physicians who care for the majority of patients with diabetes in Canada.

We reimburse participants for participation in research. We pay for their expenses (such as eating breakfast and parking). We use a lot of advertising because many people with diabetes have not seen a specialist or diabetes educator and do not understand why they might need further care.

Our patients have many other rules to follow, so we encourage a friendly and non-judgmental attitude. If we tell research participants “You can’t have that birthday cake” they will not come back. If a patient’s blood sugar was high on one day because he/she ate a piece of cake at a family birthday party, I say, “well, that’s good, you should have cake once in a while. Just don’t have it every

day.” Then they feel okay about telling us that they cheated, because they will cheat. Support is crucial because this is a chronic disease with very poor outcomes.

### **The Future of Diabetes Research**

Further diabetes research will be conducted in public awareness, pathophysiology, genetics, obesity, “metabolic syndrome,” prevention strategies, gene therapy, transplants, designer drugs, complications, outcomes, and quality of life. We see increased public awareness with regard to risk factors for diabetes. The American Diabetes Association and the Canadian Diabetes Association are working hard to get the message across. There will be more research studies about prevention of diabetes.

The most successful prevention studies have looked at people with impaired glucose tolerance who do not quite have diabetes yet. The United States Diabetes Prevention Program was a hugely successful study that was stopped in the third of five years because it demonstrated a 58% reduction in new onset of diabetes in people at risk with intensive lifestyle. Prevention studies of new medications that have been proven to prevent the onset of diabetes in people at risk are underway, such as the DREAM and NAVIGATOR studies.

There is a great deal of research underway in the pathophysiology and genetics of diabetes. We must do something about obesity, the world’s second largest epidemic. Obesity is the major modifiable risk factor for diabetes. “Metabolic syndrome” — the clustering of events such as hypercholesterolemia, hypertension, obesity, and impaired glucose tolerance — is the subject of much research because it affects so many body systems.

Gene therapy is a major area of diabetes research. Stem cell research in Type 1 diabetes is at the utmost of the minds of parents of children with Type 1 diabetes. This is still controversial. Many designer drugs in development try to address the metabolic syndrome. In Edmonton, researchers have developed the Edmonton Protocol to transplant islet cells into people with Type 1 diabetes. Surgeons are performing pancreatic transplants at the time of renal transplants, but pancreatic transplants alone have not been successful.

We must continue to work on prevention strategies and new treatments for complications. There are some new drugs in development looking at new mechanisms in endothelial dysfunction. We are doing a lot of long-term outcomes research, trying to change the endpoints of cardiovascular disease, retinopathy, and nephropathy. More quality of life studies are being integrated into the diabetes care world.

I asked people with diabetes why they participated in diabetes research. Their answers included:

- “For better information.”
- “Better care.”
- “For the benefit of all people with diabetes in the world.”
- “For my kids.”
- “To improve my condition.”
- “To be policed.”
- “I feel better when I am here.”