Bariatric Surgery and Diabetes

The statistics are staggering…a child born in the year 2000 has a 1 in 3 chance of developing diabetes in his or her lifetime. Twenty-four million people in the United States and over three million people in Canada have diabetes. It is estimated that 25% of those with diabetes are undiagnosed and untreated. Even more worrisome are the 90 million people with pre-diabetes or metabolic syndrome--sure to progress to diabetes they don't change their lifestyles. Diabetes increases in prevalence with age; however, the number of young adults and children with diabetes is also growing at an alarming rate. Diabetes is widely recognized as a leading cause of death and disability. It causes long-term complications that affect almost every area of the body including blindness, heart disease, stroke, kidney disease, nerve damage, and the need for amputations.

Diabetes occurs when the body does not produce or use insulin properly. Insulin production begins when we eat. Most of the food is broken down and converted to a form of sugar called glucose--the main source of fuel for the body. Glucose flows through the bloodstream to reach the cells. Glucose requires insulin, a hormone produced by the pancreas, to enter the cells. When we eat, the pancreas is directed to produce the right amount of insulin to move glucose from the bloodstream into the cells where it can be used for energy. When the pancreas secretes little or no insulin, or when the cells are resistant to the insulin that is produced, blood sugar levels rise. The body is unable to utilize its main fuel source, glucose, despite its abundance in the bloodstream.

Diabetes is a complex disease with both genetic and environmental factors. It has been divided into different types.

Type 1 Diabetes is when the pancreas fails to produce an adequate amount of insulin, resulting in high blood sugar levels. Someone who has type 1 diabetes must take insulin to live. Type 1 diabetes accounts for only about 5-10% of the cases of diabetes. It most often develops in children or young adults.

Type 2 Diabetes occurs when the cells become resistant to insulin and are unable to properly use the insulin that is produced. It is the most common type of diabetes and is associated with older age, obesity, a sedentary lifestyle, a family history of diabetes, a history of metabolic syndrome or gestational diabetes. Type 2 diabetes may go undiagnosed because the sypmtoms of fatigue, nausea, unusual thirst, frequent urination or the slow healing of wounds can develop gradually, or there may be no symptoms at all.

Gestational Diabetes develops in 4% of all pregnancies. The hormonal changes that take place during pregnancy require the pancreas to secrete about three times the normal amount of insulin. If the pancreas is not able to produce the additional insulin or if the cells become resistant to the insulin that is produced, blood sugar levels rise. Blood sugar

levels usually return to normal within a few weeks of delivery, but women with gestational diabetes have a 60% chance of developing diabetes later in life.

Pre-Diabetes occurs when blood glucose levels are higher than normal but not high enough for a diagnosis of type 2 diabetes. There are twice as many Americans who have pre-diabetes than diabetes.

Metabolic Syndrome increases the risk for type 2 diabetes and cardiovascular disease. It is associated with obesity in the middle section of the body, insulin resistance, often high triglyceride levels in the blood, low HDL (good) cholesterol, high blood pressure, polycystic ovary disease, and impaired glucose tolerance.

Bariatric surgery can have a dramatic impact on type 2 diabetes and pre-diabetes. In fact, studies show that more than 80% of type 2 diabetics having the Roux-en-Y gastric bypass no longer have elevated blood sugar levels. The blood sugar level improves almost immediately--even before patients lose significant weight. Studies have found this works because the food does not pass through the first section of the small intestine (the duodenum), and diabetes is sent into remission. Scientists are also looking at the negative energy balance and changes in gut hormones following surgery to understand the mechanism of this extraordinary 'cure' for type 2 diabetes.

In a small study (60 patients), adjustable laparoscopic banding was found to resolve type 2 diabetes. In this study, 87% of those who had mild diabetes and lost at least 10% of their body weight were able to stop taking all diabetic medications within a year of surgery. The mechanism here is simple; adjustable laparoscopic banding helps people to lose weight, and weight loss resolves type 2 diabetes.

"For the first time in diabetes history we have a concrete chance to create a major shift in treatment goals: from improving life with diabetes to the hope of a life without it."
--Francesco Rubino

The Roux-en-Y gastric bypass may be an answer for those who are obese and diabetic, but what about those with type 2 diabetes who are not 100# or more overweight? The National Institute of Health guidelines for the Roux-en-Y gastric bypass require that a person be severely to morbidly obese to qualify for the surgery. Those with type 2 diabetes who are only mildly obese do not qualify for surgery. Clinical trials on diabetics who are not obese have begun. For these patients with a lower body mass index, the focus shifts to a diabetes-specific procedure, often leaving the stomach intact, but bypassing the first section of the small intestine. In Brazil, Ricardo Cohen has performed surgery on 65 non-obese diabetics and produced a full remission in 65% and a partial remission in 12%.

Several diabetes experts acknowledge that the procedure shows promise, yet stress that more controlled clinical trials are needed to validate the effectiveness and safety for diabetics with lower body weights. Others are looking to understand the exact mechanism that causes the surgery to alleviate diabetes so that medications can be found to mimic the effects. Very promising treatments or cures are likely to result from these exciting findings.