

## Diabetes mellitus, Type II

### Our Philosophy and Protocols of Management

#### What is diabetes mellitus?

People with diabetes mellitus cannot properly process glucose, a sugar the body uses for energy. As a result, glucose stays in the blood, causing blood glucose levels to rise. At the same time, however, the cells of the body can be starved for glucose. Diabetes can lead to poor wound healing, higher risk of infections with the suppression of the immune system, accelerated symptoms of aging, accumulation of advanced glycation endproducts, an increase in circulating inflammatory markers (which lead to an early death<sup>1</sup>) and many other problems involving the eyes, kidneys, nerves, and heart.

There are two types of diabetes mellitus. Adult-onset diabetes is also called *type II* or non-insulin-dependent diabetes. With type II diabetes, the pancreas often makes enough insulin, but the body has trouble using the insulin. Type II diabetes responds well to pharmacological and natural therapies.

Childhood-onset diabetes is also called *type I* or insulin-dependent diabetes. In type I, the pancreas cannot make the insulin needed to process glucose. Natural therapies cannot cure type I diabetes, but may help by making the body more receptive to insulin supplied by injection. Except for using chromium picolinate to help decrease insulin resistance, we don't recommend any other supplements to directly help with this type of diabetes.

So, what are the standard goals and regimens used for the treatment and long-term management of diabetes? Simple (if it were only so!)...keep the blood glucose levels down to as near normal as possible without too frequent of hypoglycemic episodes. By keeping it as close to normal as possible, you will avoid or greatly delay the onset of

diabetic complications, e.g., neuropathy, nephropathy, and retinopathy.

#### So how do we diagnose diabetes?

First, we here at Ultimate Living Medical Clinic have a low threshold to test for diabetes. Published studies find that most people diagnosed with diabetes have had it for FIVE YEARS before it is discovered. That is four years and 364 days too long and it allows for more damage to occur. The gold standard test for diagnosing diabetes is with a two-hour glucose tolerance test (which we can perform here). The original "cutoff" of 126 mg/dL for fasting glucose used to be the point at which you are given the tolerance test. We here at Ultimate Living Medical Clinic tend to order it more frequently and we also check the "C-peptide" level. Briefly, C-peptide is the level of insulin that your body makes for itself. If the C-peptide is high and you ARE a diabetic, it means that you can be controlled with diet and oral medications (injected insulin is probably not necessary). If the C-peptide is high and you are NOT a diabetic, it means that you are insulin-resistant and you are "becoming" a diabetic, whether that is in one month or in four years. This condition MUST be treated aggressively to avoid the onset of diabetes.

#### What are the regimens used here?

The first is diet. If you are overweight, you must lose the excess weight. Many times that is all that is needed to control the insulin resistance. However, you will always need some type of medication if you have been diagnosed with diabetes, no matter your weight or glucose reading. But if you can't keep the weight off, then you won't be able to keep it under control. The best diet to lose the weight is a high protein, low carbohydrate diet. If you also include a Very Low Calorie Diet option, this is known as Medifast® and we provide the program here and will monitor your progress. Speak with Dr. Work about starting that program today.

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<sup>1</sup> Soinio, M. et al. High-Sensitivity C - reactive protein and Coronary Heart Disease Mortality in Patients With Type 2 Diabetes. *Diabetes Care* 29:329-333, 2006.

If your weight is now controlled and your body fat content is now in the normal range, the best diet for the management and the PREVENTION of the onset of diabetes, in our opinion, is the low-glycemic index diet<sup>2</sup>. It goes by many different names but the diet is actually quite simple and you will not need to buy any books. When you become a diabetic, refined carbohydrates are now not to be consumed in any significant quantities. Also forbidden is any fruit juice and no potatoes in any form (sweet potatoes and yams are okay). Refined carbohydrates are defined as sugar and flour products of any kind, e.g., bread, pasta, tortillas...doesn't matter if the bread is white or wheat...the only bread that you can eat is "sprouted grain" bread. You can find that at Vons, Trader Joe's or at Whole Foods under the brand name "Ezekiel 4:9". If you are not a diabetic and you eat this way, insulin resistance will literally disappear and no longer be an issue with your health. Animal protein, i.e., meat, is fine in normal quantities as are fruits and vegetables. No processed meats and no frying of foods are allowed.

The next step to control your diabetes is with medications. The first we like to use is a class of drug known as the thiazolidinediones or TZD. The two that are currently used are Actos<sup>®</sup> and Avandia<sup>®</sup>. Both improve insulin sensitivity and appear to also keep the beta cells in the pancreas that produce insulin alive much longer. These are also used alone with people who have high insulin levels but are not diabetic or those who have fatty liver and to reduce circulating inflammatory markers.<sup>3</sup>

Another drug that is used is long-acting metformin (Glucophage XR<sup>®</sup>). This drug works in the liver to keep glucose levels down. Again, this can be used alone to help people with high insulin levels who are not diabetic. It also increases insulin sensitivity but not to as great of a degree as the TZDs.

Metformin is also used in a combination drug with another class of drug, the sulfonylureas. This class of drug is also known as a secretagogue, because it causes the pancreas to secrete insulin. Someone cannot take the sulfonylureas unless they are diabetic. The combination drug used is Glucovance<sup>®</sup>. In addition, metformin has been combined with the TZDs as Avandamet<sup>®</sup> and Actoplusmet<sup>®</sup>.

There are other secretagogues that are much more specialized and can be used in combination with these drugs noted above. The one that is used in this office is nateglinide (Starlix<sup>®</sup>). It is taken just before a meal and allows the body to respond to food with an initial quick burst of insulin.

There are two new drugs now out for Type II diabetics who fail standard therapy. The first drug is called Byetta<sup>®</sup> and it is injected twice a day. It is not insulin and non-diabetics can take it too without a drop in glucose. In a nutshell, the diabetic who uses Byetta<sup>®</sup> is not a diabetic when they use it. The effects are amazing. One side effect...weight loss...and it is also impressive. The second drug is called Januvia<sup>®</sup> and is a pill that is taken once a day. Side effects are less than the placebo was in clinical trials and it helps to maintain blood glucose very well. There is no weight loss associated with Januvia<sup>®</sup>.

### How is the glucose monitored?

The glucose is monitored routinely with the hand-held glucometer. This is the machine that you use at home to check your serum glucose. They come in many different types and some have some interesting "bells and whistles." You should check your glucose as directed by your doctor and NOT just when YOU think you are low. High glucose values generally are not noticeable. The target range with a glucometer is 70 – 120 mg/dL. It is not important to always check your first morning glucose, especially if it is consistently within the normal range. A more important reading is 2 hours after you have eaten a meal. These numbers are much more important to us and help us to treat you even better. *Frankly, most diabet-*

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<sup>2</sup> Qi, L. et al. Whole-Grain, Bran, and Cereal Fiber Intakes and Markers of Systemic Inflammation in Diabetic Women. *Diabetes Care* 29:207-211, 2006.

<sup>3</sup> Pfiitzner, A et al. Improvement of Cardiovascular Risk Markers by Pioglitazone Is Independent from Glycemic Control. *J Am Coll Cardiol* 2005;45:1925-31.

*ics in this office do not check their blood sugars routinely unless they are on insulin or a secretagogue mentioned above. They come in here every 3 months for routine testing and stick to their diet. A large majority of patients doing this have had splendid results.*

Another routine blood test that is done here at Ultimate Living Medical Clinic is the glycolated hemoglobin or the hemoglobin A1C. This test (which takes about five minutes to do here) should be done every three months to determine the “average” plasma glucose over those past three months. The target for that test is for it to be less than 6.5% (< 6.5%). Normal range for a non-diabetic is less than 6%; therefore, if you can get your A1C into the “normal” range, the chances of diabetic complications are greatly reduced.

The patients here at Ultimate Living Medical Clinic, by following our instructions, changing their diet and taking their medications/supplements including **Bios Life Complete™**, have generally been able to reduce their A1C values to within range and most have been able to go below 6%. That is no guarantee that you can attain that level, but it is clearly possible.

#### What other tests need to be done?

Generally speaking, we also need to check your kidneys yearly for any microscopic damage that is done by the diabetes. It is a simple urine test that is done in the office. We also preemptively prescribe a medication to prevent or delay the onset of this kidney damage. The medication used is a high blood pressure type and an ARB Type II is our drug of choice, e.g., Benicar®, Diovan® or Cozaar®.

We screen you for glaucoma using a pen tonometer (not the air puff that is done at the optometrist's office – this is more accurate) on a yearly basis and will refer you to an ophthalmologist if either eye's intra-ocular pressure is too high.

You will also need to have your feet checked ANNUALLY. In addition, you will need to have your cholesterol levels checked routinely. We now recommend that you be

on **Bios Life Complete™** even if you do not have a cholesterol problem. The cholesterol levels are checked here in the office but we do send out two other more specialized lab tests that screen for the complications of heart disease.

#### Hormone therapy

The vast majority of men with diabetes are low in testosterone and it should be replaced to more youthful levels to help with glucose regulation and to lower the risk of heart disease secondary to the diabetes and the low testosterone itself.

In addition, low dose human growth hormone replacement therapy using Sermorelin® has also been shown to be beneficial with the regulation of glucose but you have to more strict with your diet if you are taking HGH. Speak to Dr. Work for more information.

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