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### **DIABETES WISDOM**

Diabetes is elevated blood sugar (glucose). It results when your body does not make enough insulin (a failure in the pancreas), your body resists insulin (due to too much fat...meaning you weigh too much) or due to a combination of both of these [together] factors.

Eight percent [8%] of the population in the United States has diabetes and 25 [%]percent have [has] pre-diabetes.

#### **Diabetes is diagnosed by:**

Testing for elevated blood sugar [(glucose)] and finding a glucose level of over 140 after fasting [Fasting sugar over 140] or post-meal sugar levels consistently over 200.

Elevated blood sugar over an extended period of time requires [resulting in] a special blood test (called a glycohemoglobin...a 90 day [sugar] glucose average) being over 6.0.

#### **Symptoms:**

Generally, when diagnosed, most people have no symptoms of diabetes. They do not know they have it, but rather are told they have it based on blood test results as mentioned above.

Symptoms can be a sign of diabetes and these symptoms are [described as] the “Polys,” as in:

Polyuria (frequent urination)

Polydypsea (excessive thirst)

Polyphage (excessive eating that results in weight loss, not weight gain)

Other symptoms of diabetes relate to complications from the disease (vision changes, tingling in hands or feet) but these are rarely seen at diagnosis, so they [generally] are not usually considered related to diabetes if you are recently diagnosed.

#### **Treatment:**

Diet is the cornerstone of treatment. Losing 5-10 pounds alone can result in a dramatic improvement in blood sugar.

The focus of diabetes care is about diet:

**Balancing the diet:** Spread out calories throughout the day (3 meals and 2 snacks). Spread out the calories by reducing portion sizes of carbohydrates/starches. Eat more lean meats as a protein source.

**Reducing the diet:** Less calories in total food consumption. Less calories from starches, in particular, limiting white bread, potatoes, pasta, white rice. Less simple sugars in the forms of soda pop, other sugary drinks and candy.

**Adjusting the diet:** Choose more green vegetables. Choose more complex carbohydrates (whole grains). Avoid processed foods in favor of natural foods (and know how to shop because packaged foods found in the 'middle' of the grocery store are replaced by natural foods found on the perimeter of the grocery store).

### **Exercise:**

Burn calories with exercise. Do 30-60 minutes, 5 days a week. It can have a profound impact, but do what you can, when you can.

Just make it a habit to get exercise.

Active muscles burn sugar more effectively.  
Exercise reduces fatty tissue and makes insulin more effective.

### **Medications:**

There are four basic 'classes' of pills for treating diabetes, and two forms of injectable medication.

#### **Pills:**

Metformin (Glucophage)  
Amaryl (Sulfonylureal)  
Actos (TZD)  
Januvia/Onglyza (DPP4 Inhibitor)

#### **Injectibles:**

Byetta/Bydurion/Victoza (GLP1 Analogs)  
Insulin (various forms)

**Metformin:** This medication has been around for over 50[+] years and is extremely safe. It reduces the body's own sugar production in the liver.

Pros: Safe, inexpensive, does not cause low blood sugar (hypoglycemia); may have anti-cancer properties; can lead to weight loss.

Cons: Cannot be used with kidney issues and is less than ideal for patients over 80 years old (although can be used over 80 years old).

**Sulfonylureals (Amarily, Glyburide, Glipizide):** These medications are also over 50 years old and are very safe. They reduce blood sugar by enhancing insulin production from the pancreas.

Pros: Safe, inexpensive, strong.

Cons: Can cause low blood sugar (hypoglycemia). Kidney issues can limit usefulness.

**Actos:** This medication is 20 years old. It works by enhancing the body's sensitivity to insulin.

Pros: Just has gone generic; very effective; can improve cholesterol parameters; does not cause hypoglycemia.

Cons: General safety is established, but some questions of long-term safety-even at this late date (risk of bladder cancer); requires blood monitoring when you begin the medication.

**DPP4 Inhibitors:** These medications are the new pills and have been around for 5 years. They appear safe and work by increasing hormones that enhance insulin effects.

Pros: Appear safe; last option before resorting to insulin.

Cons: Expensive.

[INJECTIBLE MEDICATIONS:]

**GLP1 Analogs (Byetta/Bydurion, Victoza):** These medication work by enhancing insulin effects. They mimic hormone GLP1 that assists insulin in controlling blood sugar

Pros: Weight loss is guaranteed; safe.

Cons: Injection; will cause some degree of nausea; expensive.

**Insulin:** Insulin is the exact hormone lacking in diabetes. The genetically engineered hormone is provided through a very fine needle injection.

Pros: Safe; virtually identical to your body's [bodies] own hormone.

Cons: Expensive; injection; can be associated with weight gain.

**Monitoring:** There are two ways to monitor your progress in treating and controlling your diabetes.

**The Scale:** If you are overweight, then losing weight is the simplest key to treatment. Monitoring you weight and accomplishing weight loss is the single most important thing you can do.

**Goals:** If you can return to 'normal body weight' diabetes can often be eliminated, but losing 5-10 pounds can have a major impact and will improve your blood sugar.

**Blood Glucose Monitor:** These simple devices are quite accurate and virtually painless. Monitoring sugar is done regularly at first, but often can be done only occasionally, once diabetic control is obtained.

Testing the blood first thing in the morning, prior to eating, is the most important time to check. Other times are prior to meals and prior to bedtime.

Occasionally, checking a blood sugar 30 minutes after eating will allow one to see how much certain foods affect the blood sugar.

Goals: Fasting (morning) blood sugar: Should be under 140, preferably 120 or below.  
Before meal sugars: Under 140 is preferred, but definitely under 200.

**Glycohemoglobin (also called HBA1C):** This is a 90 day average for your blood sugar and is measured by a different scale than the other blood sugar testing. It is performed by a routine blood test or a special fingerstick blood test done only in the office.

Glycohemoglobin levels:

6.0 and below:	Normal. Most excellent control
6.1—6.9	Excellent blood sugar control
7.0—8.0	Solid blood sugar control
8.0—10.5	Too high. Unacceptable levels
10.6 or greater	Severely out of control and must be lowered

A glycohemoglobin below 8.0 is a definite goal for all diabetic patients because control that results in numbers of 8.0 and below result in less overall complications of diabetes over the years.

Some patients will use this as their preferred test for monitoring so that they can perform limited glucose testing at home. This is quite acceptable.

**Hypoglycemia:** Hypoglycemia is low blood sugar (below 80) and can result from treatment of diabetes. This is the result of overactive medications, either pills or shots.

Hypoglycemia symptoms include: shakiness, tremor, confusion, cold sweating, general weakness.

Treatment: Eat something sugary quickly. Sugared soda, fruit juice, candy, sugar itself (or glucose tablets) will readily resolve low blood sugar and resolve the symptoms associated with it.

Prevention: Reduce your medication or eat at proper intervals to avoid this low blood sugar.

**General Goals for the New Diabetic Patient:**

Education: Diabetes is a lifelong illness . It is critical that you understand your condition, it's treatment and proper diet. This book provides only a cursory introduction. More resources can be found at:

<http://doctordoug.com/health-information-for-our-patients/recommended-medical-resources/>

Diet: Learn about carbohydrates and balancing your diet to both lose weight and reduce blood sugar excursions.

Lose Weight: If you are overweight, the single most important way to get your diabetes under control is lose weight. If you can possibly return to a normal weight, this is the best possible treatment as it often can result in the complete resolution of diabetes. Of course, if you gain the weight back, you will get your diabetes back as well, so you will never be without the potential for diabetes.

Losing 5-10 pounds will make a difference in your blood sugar, but losing even more is better.

Monitor glucose: Check your blood sugar regularly until you have an understanding of your general levels. Start off with checking before breakfast (fasting), before lunch, before supper and before bedtime. Reduce to twice daily (fasting and before supper), then reduce to once daily (fasting only). If control is generally present, checking sugar once or twice a week, fasting, is reasonable.

Glycohemoglobin: Check this every 3 months after beginning treatment (this is done at the office). Once control is clear, then you can check this every 6 months.