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Preventing Diabetes Mellitus

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What is your risk of developing Diabetes? There are six risk factors for developing Type II Diabetes Mellitus. There is a seventh with female patients. SETMA has devised an electronic method for assessing your risk every time you see your healthcare provider. A summary of your risk will be given to you each time you visit SETMA. Because the most important risk factor is being overweight, SETMA's Diabetic-Prevention-Program document begins with the following statement:

“10-15 pounds of excess weight places a person at a higher risk for developing diabetes, but 10-15% decrease in weight, even if a person is obese, decreases that risk significantly.”

This statement continues, “The bad news is that more people are at greater risk of developing diabetes than think they are, but the good news is that a person can help decrease their risk without attaining their ideal body weight.”

The document then tells you how many pounds you are over your ideal body weight and how many pounds (10-15% of total body weight) you need to lose, in order to decrease your risk of developing diabetes.

Elements of Preventing Diabetes

There are six factors which place you at higher risk for the development of diabetes; a seventh factor only applies to women.

1. Family History

The first factor is “Family History.” Both types of diabetes, I and II, have genetic links but the link with Type II diabetes is not absolutely determinant. It is possible for a person with a family history of Type II Diabetes not to develop the disease, if they pay attention to their health. Family History is important in three regards as to this risk:

- Type II Diabetes itself. If you have a family history of this disease, it places you at a higher risk.
- Hypertension. If you have a family history of high blood pressure, you have a higher risk of Diabetes Mellitus.
- Elevated Cholesterol. If you have a family history of lipid abnormalities, which would include elevated cholesterol, or decreased HDL or elevated triglycerides, you have an increase risk of developing Diabetes.

2. Overweight/Obese

The second factor and perhaps the most important is being overweight. The twin epidemics of obesity and diabetes are expected to reduce life expectancy in the not so distant future.

- Obesity afflicts 300 million people worldwide, and
- an estimated 194 million have diabetes;
- The total number of people with diabetes is projected to hit 366 million by 2030.
- The number of Americans with diabetes is expected to almost double from 18.2 million in 2003 to 30.3 million in 2030.
- The United States ranks third behind India and China in the incidence of diabetes.

When you realize that almost one third of the people in the world who are overweight or obese live in the United States, you see what a public health problem this is in this country. Also, if you look at the dietary habits of the three countries which have the highest incidents of diabetes, India, China and the United States, you see that a high, non-fibrous carbohydrate diet contributes considerably to weight gain and the risk of diabetes.

From a clinical standpoint, regardless of whether a person is lean or obese, accumulation of intra-abdominal fat results in:

- insulin resistance and
- raise the risks of diabetes
- cardiovascular disease

Until recently adipose (fat) tissue was regarded as a passive storage depot for lipids. The fat cell is now considered to be a highly active and complex endocrine gland. Alterations in adipose tissue metabolism in obese individuals may be the missing link between insulin resistance – the inability of the muscle, liver and other tissues to respond properly to insulin -- and cardiovascular disease.

Adipose tissue secretes a number of substances which have a negative impact on health, which:

- dampen the effect of insulin,
- impair glucose utilization in skeletal muscle,
- promote glucose production by the liver, and
- impair insulin release by pancreatic beta cells.

Weight loss through diet and exercise is the best approach to reduce visceral fat. Decreasing adipose tissue mass alone will not improve metabolic abnormalities associated with obesity. When subcutaneous abdominal adipose tissue was removed by liposuction in obese women with normal glucose tolerance and women with diabetes, there were no significant changes in either group regarding the fat cells production of the substances which harm one's health.

Four recent trials have demonstrated that more than half of new cases of diabetes could be prevented through simple lifestyle changes. The most effective ways to prevent diabetes are to maintain:

- a BMI under 25 kg/m² (optimal BMI is between 21 and 23 kg/m²) and
- to exercise at least moderately for 30 minutes a day.

When overweight people in a diabetic prevention program:

- lost 7% to 10% of their body weight and
- began taking half-hour walks 5 days a week,

they decreased their risk of developing diabetes by 58%.

3. Low Birth Weight

The third risk factor for the developing of diabetes is a low birth weight. If your birth weight was less than 2,500 grams (5 pounds 9 ounces), you are at a higher risk of developing diabetes. Those who were underweight at birth and become overweight in middle age have the most severe insulin resistance and the greatest risk of Type 2 Diabetes Mellitus, possibly because intrauterine growth restriction leads to inadequate pancreatic development. At all ages, the risk of impaired glucose tolerance, or Type II Diabetes Mellitus rises with increasing body weight.

4. Blood Pressure

The fourth risk factor for the development of Type II Diabetes is elevated blood pressure. If your blood pressure is greater than 130/80, you are at a higher risk of developing Type II Diabetes Mellitus.

The reasons for this are not totally clear but it is well established that one of the causes of treatment-resistant hypertension is insulin resistance. All of the elements of insulin resistance contribute to inflammation in the arteries, to

increase blood clotting and to arterial constriction. Each of these increases the probability of the development of hypertension and is benefited by the decreasing of abdominal fat which decreases the production of the substances which harm the body.

5. Abnormal Lipids

Lipids are cholesterol, triglycerides, HDL and other particles in the blood which contribute to heart and vessel disease. The classification of lipid disorders is complex but if you have Fredrickson's classification IIa, IIb or III you have a significant risk of developing heart disease and each of these abnormalities and others are both associated with the development of Type II Diabetes and are worsened by Type II Diabetes. You should know whether you have a lipid abnormality and if you do, you should know what type you have. Typically, a type IIa, IIb or III will require medication to effectively treat and that treatment will often last a life time to be effective.

- If your cholesterol is over 150;
- if your HDL is below 40;
- if your triglycerides are above 150,

you need to institute life-style changes to improve each and/or you need to begin medication if life-style fails to reach the desired goals. If your lipids are abnormal, in order to eliminate disease risk, your:

- total cholesterol should be treated to reach a level below 120,
- HDL above 40 and
- Triglycerides below 90.

Another lipid particle which is very important is called LDL and it should be treated to reach a level below 70.

6. Non-Caucasian Ethnicity

The sixth risk factor for the development of Type II Diabetes is ethnicity. If you are non-Caucasian, you have a higher risk of developing Type II Diabetes Mellitus. In that this cannot be changed, it simply means that you have to work harder on the other risk factors so as to avoid Diabetes Mellitus Type II.

7. Gestational Diabetes

The seventh risk factor for the development of diabetes mellitus obviously applies only to women. It is determined by whether during pregnancy the blood sugar rose and condition developed call "gestational diabetes," that is, diabetes while pregnant which resolved once the pregnancy was over. While this does not

cause diabetes, it indicates that the patient has marginal pancreatic beta cell function and has a higher risk of developing Type II Diabetes later in life.

Conclusion

The prevention of Type II Diabetes is potentially accomplished by affecting each of these seven factors. Obviously, there are several factors which you cannot change:

- Family history
- Birth Weight
- Ethnicity
- Gestational Diabetes

These four simply alert you to the fact that you must pay special attention to the three factors which can be changed.

There are three factors which can be changed:

- Weight
- Blood pressure
- Lipids

The last two can be affected with medication, but the most important way to change your blood pressure and your lipids is the same way that you can change your weight:

- Exercise
- Dietary modification

SETMA's LESS Initiative

This brings us to SETMA's **LESS Initiative**. Its elements are:

Lose weight
Exercise
Stop
Smoking

If you are at increased risk of developing diabetes, it is imperative that you lose weight, exercise and stop smoking. Smoking is an element of preventing diabetes because tobacco fumes and the poisons in those fumes compound all of the harm effects of fat cells and of a sedentary life style.

If you have any of these seven risk factors, the conclusion to **SETMA's LESS Initiative**, which will be given to you each time you visit SETMA, states:

“Based on your age, body mass index (BMI), and the risk factors listed above you have a risk of developing diabetes. You must lose weight, exercise, stop smoking and/or avoid inhaling other people's smoke, and you need to maintain your weight loss through continuing to exercise. We will continue to monitor your blood pressure, blood sugar and lipids on a regular basis.”

This is followed by the plan of care which states:

“We will provide you with follow-up counseling to help you stay on track towards health lifestyles. We will monitor you annually for the development of diabetes.”

SETMA's goal is to help you avoid Diabetes Mellitus. Diabetes Mellitus can be prevented in many cases. It is your healthcare provider's responsibility to give you the above information. It is your responsibility to act upon it. Remember, it is your life and it is your health.