Beating insulin resistance through lifestyle changes

This information is relevant to people at risk for type 2 diabetes, those who already have type 2 diabetes, pre-diabetes, polycystic ovary syndrome (PCOS), high triglycerides or low HDL cholesterol, women who had diabetes during pregnancy, women who have excess facial or body hair, some people with high blood pressure or heart disease and many people who are overweight.

Background:
Increasing evidence is available from research showing that type 2 diabetes (previously called adult onset or maturity onset diabetes) is caused by “modern” eating habits and lack of activity.

The first step in the path toward type 2 diabetes is insulin resistance, and this is often present already in children! Insulin resistance refers to the difficulty insulin has doing its job, which is to control the way the body handles carbohydrates, or sugars. Cells “resistant” to insulin fail to respond normally to the insulin secreted by the pancreas. Early on in this condition, the pancreas simply makes more insulin to overcome this resistance. But eventually the insulin cells “wear out” and can no longer put out enough insulin to do the job. When this happens, sugar (or glucose) cannot get inside the body cells normally. High blood sugars then develop, and that is what we call diabetes.

Many cases of PCOS – now the leading cause of infertility in the US, high blood pressure, high triglycerides, low “good” (HDL) cholesterol, liver problems, even gout and many heart attacks are caused by this same insulin resistance – all due to "modern" eating and inactivity, and all this can happen even before a person gets diabetes.

The lifestyle suggestions presented below each improve the insulin resistance we just described, and therefore delay or maybe even avoid the “wearing out of insulin cells” described above. This is how behavioral changes are likely to prevent diabetes. For people who already have diabetes, making it as easy as possible for the remaining insulin cells to do their job should “save” what is left as long as possible AND diabetes medications can work much better if they do not have to overcome insulin resistance. Also all the other conditions associated with insulin resistance improve if insulin resistance is improved.

To fully understand what this is all about, we must first talk some about food. The bulk of all food is made up of carbohydrate, protein and/or fat. Carbohydrates are mainly found in plant foods. All carbohydrates are digested into sugar, mainly glucose. Carbohydrates are an essential part of the diet since glucose is the major fuel that the body runs on. However, insulin is needed to properly store glucose
after it gets into the blood after digestion. So the challenge is how to get all the carbohydrate that is needed into the body without overwhelming the insulin system.

In the specific points below you will see we are in each case recommending something that will help insulin do its job or will lead to less insulin being needed.

**Health problems associated with insulin resistance:**

- Obesity, particularly around the abdomen
- Type 2 diabetes and “pre-diabetes”
- Gestational (pregnancy) diabetes
- High blood pressure
- High blood triglycerides
- Low blood “good” (HDL) cholesterol
- Heart attacks and strokes
- PCOS
- Infertility
- Excess facial or body hair in women
- Liver problems
- Some cases of pancreatitis

**What to do?**

1. **Increase activity level**

Most of us have cars, more of us have desk jobs, and “labor saving” devices are everywhere. That is a big part of the problem. During aerobic exercise and for several hours afterward, glucose can get into the muscle cells of the body without insulin. Any aerobic activity will do. Vacuuming, dancing, walking, mowing the lawn. Thirty to forty-five minutes of aerobic activity five times per week will really help your body. Much less insulin is needed in this situation and that is a big help. Recent research has shown that 30 minutes of activity five days per week plus small changes in weight (~5-7 percent, that’s 10 – 14 lb for a 200 lb person) reduce the risk of developing diabetes by more than 50 percent!

In addition, making changes in Activities of Daily Living such as parking further away from your destination, hiding the remote control for the TV or taking the stairs instead of the elevator, will all increase glucose burning throughout the day. Remember, you want to help the muscles burn energy to get rid of excess glucose.

Many find it helpful to get a pedometer (“step counter”) to monitor their activity; 10,000 steps per day is a number many strive for ([www.thewalkingsite.com](http://www.thewalkingsite.com)), but any increase over baseline will help. There is also evidence that “fidgeting” – for
instance tapping the foot while watching TV – can help! Try to make some movement while sitting a habit.

Oh and don’t forget, exercise can be fun!

2. Reduce total calories

Reducing total calories will improve insulin sensitivity immediately. Long term reductions in calories consumed combined with exercise will help with attaining the 5-7 percent weight loss. Many experts see our current food environment as toxic. Due to scheduling, families are eating out in restaurants more often. Portion sizes have grown enormous over the past few decades and most of us have lost the ability to eyeball normal portion sizes. To regain a sense of normal portions, please use measuring cups at first to help with downsizing your portions.

3. Increase the amount of water in your food

Recent studies have shown that eating foods that are bulky, but do not contain much energy, helps control weight. The easiest way to do this is to eat more food containing lots of water, such as non-cream based soups and fruits and vegetables. Conversely foods very low in water, such as dried fruits, should be avoided. But just drinking lots of water does not seem to work, the water must be part of the food.

4. Increase fiber intake (25 - 35 gm/day)

Fiber slows the digestion of carbohydrate and therefore slows the rate at which glucose enters the blood stream after eating. Increasing fiber intake will lower the amount of insulin needed by the body.

5. Decrease total carbohydrate to 40 - 45 percent of daily calories

Plant foods (carbohydrates) turn 100% into sugar in the body. When less total carbohydrate is eaten, the pancreas needs to supply less insulin to control the blood sugar.

6. Eat foods with lower glycemic index / load

The glycemic index is a way to determine how quickly a carbohydrate food will digest and enter the blood stream. The slower a food digests, the easier it is for the body to process and utilize that food, because the insulin response to a low glycemic index food can be less. There is some evidence that people who consume a lot of high glycemic index foods are at higher risk for developing diabetes. Thus it makes sense to favor eating foods with lower glycemic index (if you want to learn more about the glycemic index check out www.glycemicindex.com). The total of the glycemic index of foods eaten at a meal is called the glycemic load.
7. When using fats, choose “good fats” - monounsaturated (MUFA) & polyunsaturated (PUFA)

MUFA’s are the fats found in olive oil, canola oil, nuts, olives, avocados and sesame seeds. PUFA’s are the fats found in other vegetable oils, walnuts and soft margarine. These fats are generally liquid or soft at room temperature. If you eat less carbohydrates and that leaves you hungry, to be comfortable you may need to replace that food with something else. The other fuel that the body uses is fat and so the obvious foods to replace carbohydrate calories with are fat calories. But you cannot just use any fat or you will increase your LDL / bad cholesterol. On the other hand adding in small amounts of MUFA’s and PUFA’s can actually lower LDL cholesterol. But remember, the overall goal is to reduce total calories to lose weight. So try to cut out as much carbohydrate as you can, snack on MUFA and PUFA foods if you are hungry, but watch that you don’t replace all the calories that you cut out by adding snacks! Beware - fat has more than two times as many calories per gram as does carbohydrate.

Avoid “bad” fats, the saturated and trans fatty acids. These are fats that are hard at room temperature. Saturated fats come mainly from animal sources including, butter, bacon, lard, and fatty meats. Trans fatty acids are oils that have been hydrogenated to make them hard and shelf stable in processed foods. Examples include stick margarine, and many crispy processed foods. Check the label for the words: partially hydrogenated vegetable oils and/or No Trans fats in the product.

8. Changing responses to stress

Many people overeat when stressed. There are reasons why this works to relax our bodies, but unfortunately, all those calories and carbohydrates worsen insulin resistance. Learning new responses to stress helps to lessen insulin resistance. If following this plan is difficult due to overeating during stress, please discuss this at your next visit.

Tips on Changing Habits

- Start small and make only gradual changes in your activity and eating habits.
- Try things out and don’t be disappointed if you don’t find “your” way immediately.
- Check out “Energy Expenditure of Daily Activities” on our website; it will really surprise you.
- Remember step counters are fairly inexpensive and can really help you increase what you do each day (http://walking.about.com/cs/measure/a/pedaccuracy04_2.htm); many find it’s kind of fun to try to add steps day by day.
- Or join a health club, a gym or your local YMCA.
- If you have trouble walking, try chair exercise.
• But before you dramatically increase your activity level, check with your doctor to make sure it is safe to do so for your heart and your feet.
• And if you want to get really serious about counting calories burned you may find “Energy Expenditure of Exercise” interesting.
• A way of eating that incorporates many of the healthy choices we have just reviewed is outlined in our handout, “Exchange Lists for Better Health.”
• Another currently very popular diet is the South Beach Diet.

**Type 2 diabetes can be prevented**

What is type 2 diabetes? This is the more common form of diabetes, the type of diabetes that is seen typically in older overweight people. However, ever more even younger people are getting type 2 diabetes now. Almost HALF of all people born in the US in the year 2000 are predicted to develop diabetes!

The Diabetes Prevention Program was a study funded by the US government to see if type 2 diabetes can be prevented. Here are the results:

• There were 3,234 participants in the study all at high risk of developing type 2 diabetes.
• Their ages were 25-85 years old, and they were overweight.
• They were followed in the study for almost three years on average.
• Participants who were able to lose and keep off about five percent of their initial body weight, and who were able to walk at least 30 minutes, five days a week, had their risk of diabetes reduced by more than 50 percent.
• Those who could not lose weight and exercise saw less diabetes develop if they took the medication metformin.

The risk of type 2 diabetes can be cut by more than half by a 200 lb person losing only 10 lbs and walking 30 minutes five days a week.