Diabetes & Exercise

By Donna Adler, BA, ATRIC, AEA, AFAA

Did you know that there are 54 million Americans that are pre-diabetic and are unaware of this? Diabetes is rampant in the US. While there are already 18 million diagnosed diabetics, there are 6 million that are *undiagnosed*. My intention for this article is for you to walk away with some immediate dietary and exercise guidelines to assist your diabetic clients in maintaining normal blood sugar. As an added benefit, this program also helps attain normal triglyceride and cholesterol levels.

So what is Diabetes? It is High Blood Sugar. It's where your body creates a condition of insulin resistance, therefore increasing your chances of developing type 2 Diabetes and heart disease. When you have insulin resistance, your body has problems responding to insulin and eventually your blood glucose (sugar) levels will rise above normal. The good news is that cutting calories, exercising and losing weight can reverse insulin resistance and lessen your chances of getting type 2 Diabetes and heart disease.

There is also Type 1 Diabetes and that is 5-10% of the population. This is caused by a virus, antibodies and/or heredity. All the Beta cells have died so they cannot make insulin, and insulin must be injected to survive. (Beta cells are the cells that make insulin, and all of us are born with a lifetime supply.) 90-95% of Diabetics are Type 2. That's where 50-80% of the Beta cells have died due to overuse and toxic effects. This used to be called "Adult Onset" Diabetes, but it is becoming increasingly more common in children and teens. With Type 2 Diabetes, you have insulin resistance, and the body needs higher than normal levels of insulin to lower blood sugar.

Insulin's job is to help the body use glucose for energy. It is an amazing hormone made in the Beta cells in the pancreas that tells the cells what to do with sugar. It lowers blood sugar, stores fat, controls the use of stored fat, affects growth, your DNA and affects blood pressure, cholesterol and triglycerides. It's made by the pancreas, an organ located behind the lower part of the stomach. Your pancreas usually makes just the right amount of insulin to match the food you eat.

Sugar is a basic fuel for the body, while Insulin is a hormone which directs sugar in the body. However, if you continue to eat foods that use up your beta cell stores, one day your pancreas says, "Hey, I can't do this anymore." Basically, you've "eaten up" your lifetime supply of carbohydrates that trigger insulin resistance. It's a bit outside the box as far as ADA guidelines are concerned, however, I have seen the diet I will explain to you used by many of my clients, and I've seen dramatic results. Not only does their blood sugar normalize, their triglycerides and cholesterol levels also improve. However, it is also a combination of the correct style of *exercise*, which is what I call the "reverse pyramid" to what we normally do when we exercise. This program was developed by Dr. Richard K. Bernstein, and he is a Type 1 Diabetic diagnosed at age 12. He is 75 years 'young' currently!

Type 2 Diabetes is caused by how we eat and how we live – our lifestyles. Currently there are twice as many *new cases* of Type 2 Diabetes diagnosed each year compared to 10 years ago. Our genetic makeup hasn't changed that fast, so it's not our genes. It's how we live, eat and drink – that will affect what genes are 'activated'. The amount of sugar adults get from soda, fruit drinks, alcohol, sport drinks, juice, etc. has **quadrupled**

from 1965 to 2002.* Did you know that 12 ounces of soda (1 can) = 10+ teaspoons of sugar and 12 ounces of 100% orange juice = 9+ teaspoons of sugar?

First we need to talk about carbohydrates. Carbohydrates = Sugars and Starch. Sugars are one of the basic fuels which are made from sugars, starch, protein, glucose, sucrose, fructose, lactose, maltose, etc. Starches are chains of sugar. Starch = sugar to your body. Carbohydrates are not a necessary nutrient. Why? Because we can make glucose from protein, fat and pyruvate (from other body processes), and we can use that fat as fuel for the body. Here's a quick preview of the diet –

Benefits of Eating Low-Carb

- Keeps blood sugars more normal, fewer highs and lows
- You feel better quickly when blood sugars are normal
- Reduces insulin resistance
- Reduces hunger
- Makes weight loss much easier
- Rests the Bets cell and prolongs their life
- Reduces and sometimes reverses diabetes complications by keeping blood sugar, insulin resistance and insulin levels normal.
- Can reduce medicine needs for blood sugar, cholesterol, neuropathy and blood pressure

How Do I Eat Low-Carb? Protein & 2-3 veggies every meal!

- Protein each meal –
    - Whatever walks/swims/flies (3 oz = size of deck of cards)
    - Eggs or eggbeaters
    - Cheese (low fat best)
    - Nuts
    - Soy, Small portion of beans
    - Nutty Seeds (sunflower, pumpkin, sesame)
    - 8-16 oz total every day
- 2-3 veggies each meal –
    - Lettuce, spinach, cabbage, greens, any leaves
    - Yellow or green squash
    - Broccoli, cauliflower, cabbage
    - Peppers, chilis
    - Green beans, pea pods
    - Avocados, eggplant, okra
    - Celery, cucumber
    - Small amounts onion, tomato
    - Many others
- *OIL is OK*

Foods to Avoid– Grains, Roots, Fruits, Milk

- No Grains
    - Wheat: not whole wheat either
    - Corn: not fresh, canned, corn meal or masa
    - Rice: not brown or white
    - Oats: has lots more bad starch than good fiber
    - Rye: not dark either

    - Not amaranth, teff, quinoa, triticale, etc.
- No Roots
    - Potatoes, sweet potatoes carrots, beets
    - A little radishes, onions, garlic for flavor OK
- No Fruits
    - No juice
    - All the vitamins antioxidants and fiber you need are in veggies!
    - (Berries have the lowest carbs – OK before exercising)
- No Milk (lactose)
    - Not nonfat, 2% or whole
    - 10 oz milk = 1 slice bread = 15 grams carbs
    - Cheese is OK (all the lactose is fermented out)
- No Fructose, Lactose, anything with an "ose"…
- No Corn Syrup

Here are some suggestions – as for pasta dishes, put it over vegetables instead of pasta. The vegetables have more flavor than the pasta, anyways! Don't totally deny yourself – it's okay to have a 'bite' of a dessert – once in awhile.

- 30 minutes of exercise burns 15 grams of carbs (for splurges).
- It's OK to eat small portions of carbs right before you exercise; they go straight to the muscles.
- If diabetic, check your sugar 1 hour after a splurge. (It will make you think twice next time!)
- Read nutrition labels – They can legally be off by 20%!!!
- Low carb desserts (like Carb Smart Ice Cream) and low carb chocolate (dark chocolate) are OK in small portions. They do have some carbs.
- Eat 3 meals a day – with protein & 2-3 veggies
- Eat breakfast every day within 2 hours of getting up
- Protein or veggie snacks
- Oil is OK, don't deep fry.
- No sweet drinks
- No roots, fruits, grains or milk (carbs)
- No whole grains (bulk 100% wheat <u>bran</u> OK; treat yourself with organic buckwheat pancakes once in awhile)
- Eat less than 15 grams of carbs at each meal

<u>Exercise and Diabetes –"Reverse Pyramid"</u>

It is advisable that clients contact their physician before starting any exercise routine – some contraindications include heart issues, high blood pressure, retinopathy, (fragile blood vessels from retina that can rupture if you strain too much), fainting, blood sugar +170 mg/dl, sympathetic autonomic neuropathy, (unable to sweat below the waist), proteinuria (elevated levels of urinary protein), and low blood sugar.

Diet and Exercise are the foundation of Diabetes self care and prevention. One great benefit of regular, strenuous exercise in type 2 Diabetes is that it can bring long-term reduction in insulin resistance, by increasing muscle mass. Long-term muscle development can create blood sugar control and weight loss. It also reduces the rate of beta cell burnout, because the increased ratio of muscle mass to abdominal fat reduces insulin resistance and thus reduces the demand for insulin production.

Aerobic exercise is exercise mild enough that your muscles are not deprived of oxygen. When muscles exercise aerobically, they don't increase much in mass and they don't require as much glucose for energy. Nineteen times as much glucose is required when doing anaerobic activities versus aerobic activities. When you perform anaerobic exercise, your muscles break down for the first 24 hours, but then they build up over the next 24 hours. Anaerobic activities (anaerobic metabolism) demand energy at a very rapid rate, producing high-energy compounds faster than the heart can pump blood to deliver oxygen. This requires large amounts of glucose and virtually no oxygen. Why is this so good for diabetics? Well, the blood sugar drop after nearly continuous anaerobic exercise will be much greater than after a similar period of aerobic exercise because of the requirement for large amounts of glucose. As your body becomes used to this requirement, it will adjust to the stresses and more efficiently transport glucose into your muscle cells (and other organs/tissues as well). The bottom line is - you will develop greater insulin sensitivity for lowering blood sugar by performing anaerobic exercise. Your requirements for insulin will also diminish. The overall drop in insulin in your bloodstream will reduce your body's ability to hold onto stored fat, further lowering insulin resistance.

So, reverse your exercise pyramid – start working hard, so your muscles are so tired after about 20 seconds that you can't go any further. As soon as you reach this point, lower the activity and keep going. This can be done with a challenging water workout, followed by a challenging water weight workout. Just follow the same principles in your routine. Again, the most important considerations are keeping within the restrictions of your physician, and discover what you like to do best and what you will stick with. Isn't a longer life, lower stress, weight loss if you're overweight and better overall health worth the time and effort?

Biography: Donna Adler is an aquatic specialist focusing on working with people with health challenges. She is the owner of Liquid Assets for Fitness, a mobile fitness company in Phoenix, AZ, and a national presenter for AEA and ATRI. In addition to her active aquatic and personal training practice, she facilitates workshops on spiritual self-mastery.

"Shifts in patterns and consumption of beverages between 1965 and 2002" Duffey K., Popkin B, *Obesity* 2007.