

CAYMAN PULSE

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Curbing Visceral Fat by Modifying Post-Prandial Dysmetabolism

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There are two types of obesity (see newsletter December 2011). The first type is due to excess subcutaneous fat which is deposited just under the skin, and tends to be more benign. In contrast, the second type of obesity involves excess visceral fat inside the abdominal cavity, deep within the body and surrounding the gut or viscera, which can lead to serious health problems. This excess intra-abdominal fat is extremely toxic in both the short and long term, and is associated with increasing free fatty acid levels (thereby altering lipids in a malevolent way), increasing insulin resistance, and increasing hypertension. It is the hallmark of the metabolic syndrome, and why waist circumference is a very important vital sign. Given the epidemic of obesity, and its attendant risk of type 2 diabetes mellitus and related complications (nephropathy, neuropathy, and retinopathy, to name a few) curbing visceral fat is critical.

Let's start our morning with a cup of orange juice, which can be delicious with only 112 calories. Given that there are 3500 calories in a pound, it would seem to be a trivial amount of calories. It may take less than a minute to drink, particularly if one is in a hurry. Soon thereafter, most people feel a "glycemic high", which unfortunately is followed by a "glycemic low." These spikes in blood sugar result in spikes of insulin (itself atherogenic), followed by spikes in hunger. Patients find themselves craving more food, especially processed and easily absorbed carbohydrates like those containing sugar and/or wheat. The overabundance of carbohydrates is then converted to glycogen. The latter may initially be stored as subcutaneous fat (think "double chins" and "love handles"), but persistent metabolism of these foods switches the body over to creating more visceral fat. A combination of visceral fat and dysmetabolism can contribute to chronic inflammation and coronary artery disease.

On the other hand, it requires three or four oranges to produce an eight-ounce glass of orange juice. Eating three or four oranges yields the same caloric intake, but the pectin and fiber would cause a delay in gastric emptying and a blunting of the spikes in glucose and insulin, with a greater feeling of "fullness" and longer lasting satiety.

In general, one of the secrets to longevity for certain populations (for example those who live in Okinawa) is to eat nutrient rich, caloric poor vegetables and fruits that are high in fiber and take much longer to eat and digest, and produce longer lasting satiety compared to high calorie, easily digestible processed foods.

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April 8-10 Dr. Kosiborod
(Stress Echocardiograms available)

April 11 Dr. Kosiborod
(at Chrissie Tomlinson Memorial Hospital)

April 18-20 Dr. Rivas-Gotz
(Stress Echocardiograms available)

April 25-27 Dr. Chhatrwalla
(Exercise (treadmill) Stress Tests available)

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These more natural foods are much closer to our native ancestral hunter-gatherer eating patterns and can lower post-prandial glucose and improve long-term health dramatically:

- Large amounts of fresh unprocessed plants (green leafy):
 - Antioxidant rich, deeply pigmented produce such as berries, pomegranates, tomatoes, spinach, peppers, apples, and carrots.
- Moderate amounts of lean protein
- Moderate amounts of beneficial fats (nuts and seeds):
 - Omega-3
 - Mono-unsaturated fats
- Low levels of processed carbohydrates (sugar, grains)
- Low levels of saturated fats and trans fats

There are other techniques (or tricks) in slowing gastric emptying in an effort to lower post-prandial glucose:

- Foods and beverages which have increased water content (e.g. soups, water, tea, coffee, fresh produce)
- Foods that have high fiber content
- Sprinkling cinnamon:
 - When added to a high-glycemic meal can reduce both gastric emptying and post-prandial glucose spike
- Less white rice and potatoes
- Eliminate anything with added sugar of any kind
- Large amounts of lentils or *daal*
- Being nuts about nuts and other beneficial fats:
 - In a randomized study of over 7500 patients over a 5-years period, when compared with a low fat diet, the Mediterranean-style diet supplemented with 30g/day of walnuts or virgin olive oil (1 L/wk) had improved blood pressures, fasting glucose, and inflammatory markers and lowered risk of myocardial infarction, stroke and death.
 - They also rich in antioxidants, fiber, magnesium, and can slow digestion
- 1-2 Tablespoons of Vinegar:
 - A traditional salad dressing, acetic acid can also slow gastric emptying and delay carbohydrate absorption
- High protein content (without fat) also can improve satiety and glucose curves:
 - Egg whites, game meat, fish, whey protein
- Alcohol has been shown to raise HDL:
 - At lower doses (one or two drinks with or before a meal) can blunt the rise in glucose following a meal;
 - However, higher doses of alcohol do not blunt the postprandial glucose rise and can cause many other problems as well²

The goal of these techniques is to encourage portion control. If one can promote 5-10% weight loss, especially if associated with decreased waist circumference, it can dramatically lower post-prandial glucose and the risk of type 2 diabetes. A 30% reduction in calories can result in improved glucose and lipids, insulin sensitivity, blood pressure, and cardiac function.

The hard work is not just with diet, but also with exercise. In addition to its beneficial effects on cardiac function and coronary remodeling, exercise improves insulin sensitivity and lowers glucose and triglycerides acutely; furthermore, 90 minutes of walking can cut postprandial glucose in half.

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In summary,

- Choose high-fiber, low glycemic foods:
 - Whole grain, Legumes
 - Vegetables/Fruits – eat a lot of them, and eat them whole
 - Slow gastric emptying (cinnamon, vinegar)
- Eat lean protein often
 - Soy, whey, fish 2x/week, egg whites, game meat
- Grab a handful of nuts (closed fist) with berries, grains, vegetables
- Eat a green leafy salad with vinegar and virgin olive oil daily
- Avoid white flour, sugar, high-fructose corn syrup
- Pick modest serving sizes
- Watch your waist inches (less than half of your height)
- Have 30 minutes or more of daily physical activity
- Light to moderate alcohol is an option

¹Bergman RN et al, *Am J Med* 2007;120(2 Suppl 1):S3-S8

²O'Keefe JH et al. *Am J Cardiol* 2007;100:899 –904

³Hlebowicz J et al. *Am J Clin Nutr* 2007;85:152-6.

⁴Fitó M et al. *Arch Internal Med* 2007;167:119-203

⁵Josse A et al. *Metabolism* 2007;56:400-405

⁶Östman E et al. *Eur J Clin Nutr* 2005;59:983-8

⁷Nillson M et al. *Am J Clin Nutr* 2007;85:996-1004

⁸Fontana L et al *JAMA* 2007;297:986-94.

⁹Meyer T et al. *J Am Coll Cardiol* 2006;47:398-402.