

Why Glucose Spikes?

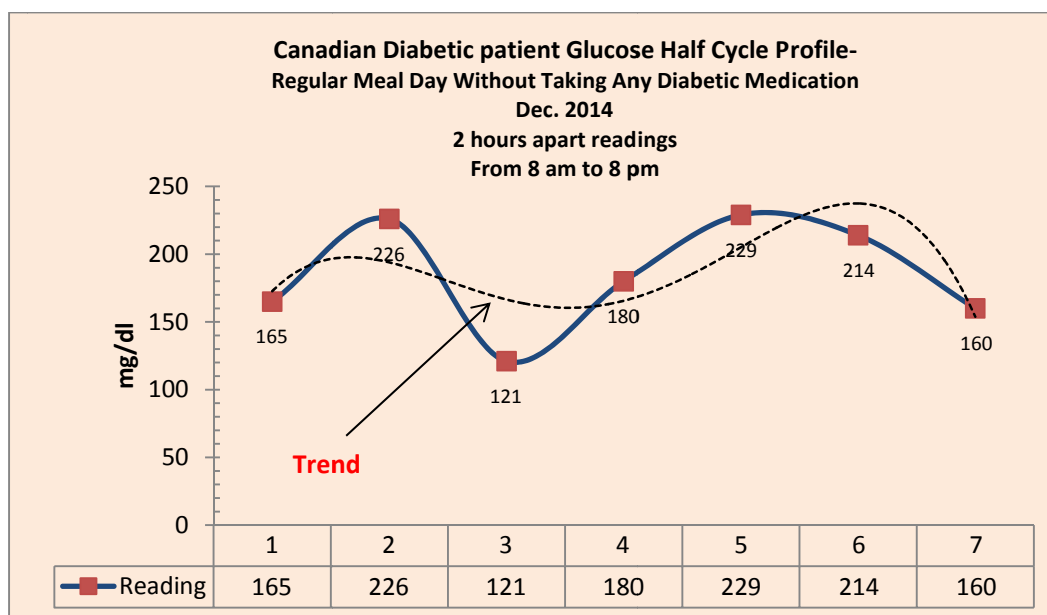
Dr. A. J. Khan

Diabetes is one of the most prevalent chronic diseases in the world. The morbidity and mortality associated with the disease is significant and derives primarily from complications of persistent hyperglycemia. Diabetes occurs when the body cannot use glucose for fuel because either the pancreas is not able to make enough insulin or the insulin that is available is not effective.

Every ailment, every sickness and every disease can be traced back to an organic trace mineral deficiency. The amount of glucose in the blood is controlled mainly by the hormones insulin and glucagon. Too much or too little of these hormones can cause blood sugar levels to fall too low (hypoglycemia) or rise too high (hyperglycemia).

The liver acts as our glucose warehouse and keeps us supplied with glucose until we eat breakfast in the morning. As we start our day, the carbohydrates we eat are digested into glucose and absorbed into the bloodstream. Some of this glucose goes to the liver and muscles, where it is stored for later use.

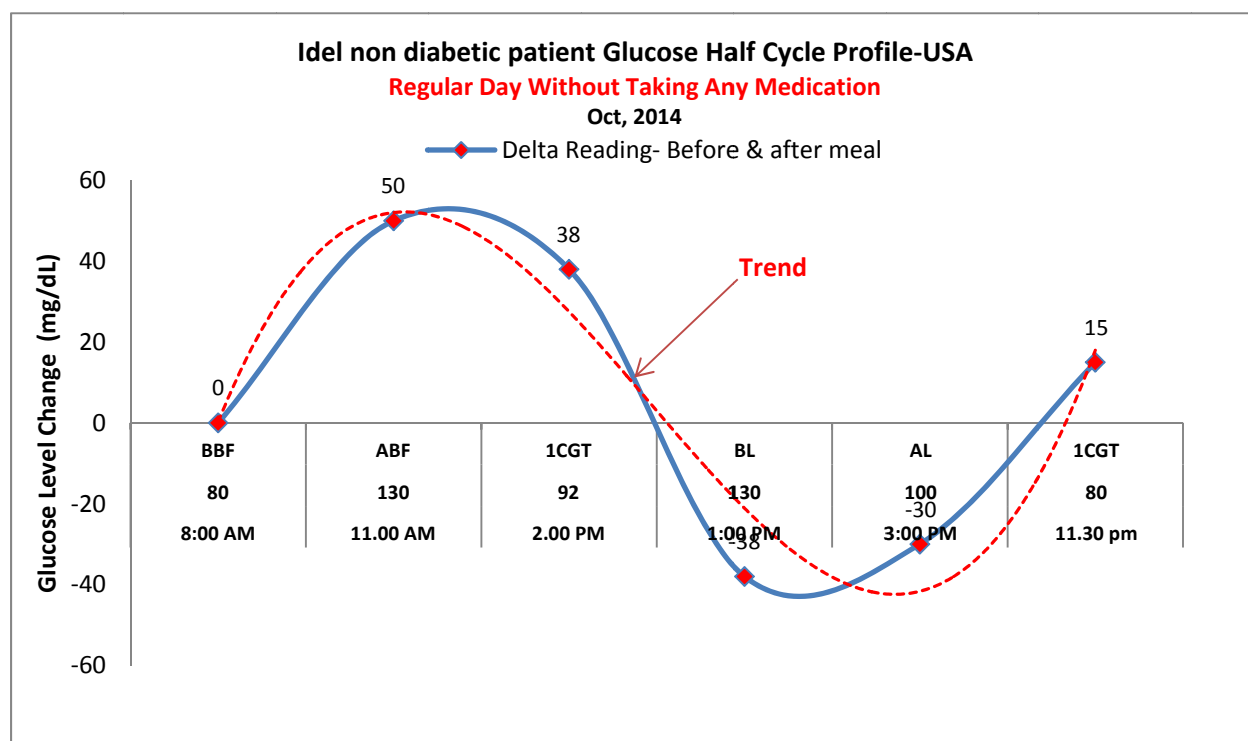
Our body uses glycogen energy between meals. Extra glucose can also be changed to fat and stored in fat cells. When blood glucose begins to fall, glucagon made by the pancreas signals the liver to break down glycogen and release glucose into the bloodstream. Blood glucose will then rise toward a normal level. In some people with diabetes, this glucagon response to hypoglycemia (low blood sugar) is impaired.



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The liver is supposed to release just enough glucose to replace what is being used, and insulin works as the messenger to tell the liver how much is enough. Sometime the messenger cannot communicate or miscommunication with liver, and the liver starts to release glucose. Once it happens the liver will release in a sense **anti-insulin hormones** such as Epinephrine, Cortisol and Amylin. These hormones can last hours in the body. This scenario happen at any time during 12 hours cycle but usually it happens to those who take insulin or drugs to increase insulin production or use wrong dose size at the wrong time of medicine such as glipizide, glyburide and metformin.



If you experience spikes in blood glucose after you eat high-carbohydrate meals, your levels will be higher than normal for as much as two to nine hours out of each day. If you have a blood sugar level higher than 200 mg/dl two hours after consuming the 75 grams of carbohydrate, you are positive type 2 diabetic patient.

Your levels should rise no higher than 140 mg/dl two hours after finishing the snack munching. Most healthy people without diabetes have two-hour readings below 120 mg/dl. The highest spikes in blood glucose levels often occur after breakfast. How much you eat as well as what you eat has a significant impact on glucose spike level regardless of medicine intake.

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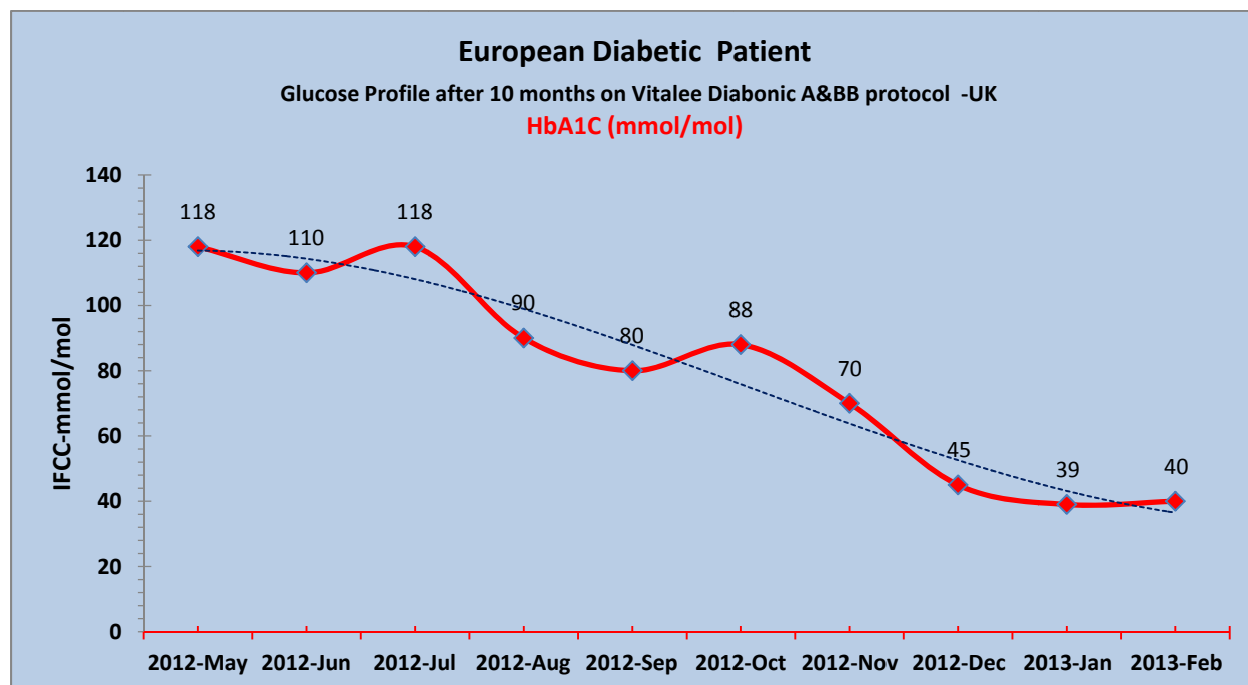
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The reason blood glucose tends to spike after eating in many people with diabetes is a simple matter of timing and food contents as you see in above chart

- ❖ *High-fat foods are digested more slowly than low-fat foods.*
- ❖ *Solids are digested more slowly than liquids.*
- ❖ *Cold foods are digested more slowly than hot foods.*
- ❖ *Under-ripe and undercooked foods are digested more slowly than fully ripe or well-cooked foods.*

Foods with a moderate glycemic index (approximately 45–70) digest a bit slower, resulting in a slightly less pronounced blood glucose peak approximately 45–60 minutes after eating. Foods with a low glycemic index (below 45) tend to cause a slow, gradual blood glucose rise. The blood glucose “peak” is usually modest and may occur an hour or two after eating. The glycemic index is a ranking of how quickly a food is broken (carbohydrates by their absorption rate) down during digestion and raises blood glucose . Please study attachments for better understanding and selecting alkaline and high pH and food with higher anti-oxidant values.

- ❖ *Glycemic Index of Food attachment- Lower the value the better it is*
- ❖ *Food Categories to avoid acidic food choices.*
- ❖ *Anti-oxidant food levels. Higher the value the better it is.*



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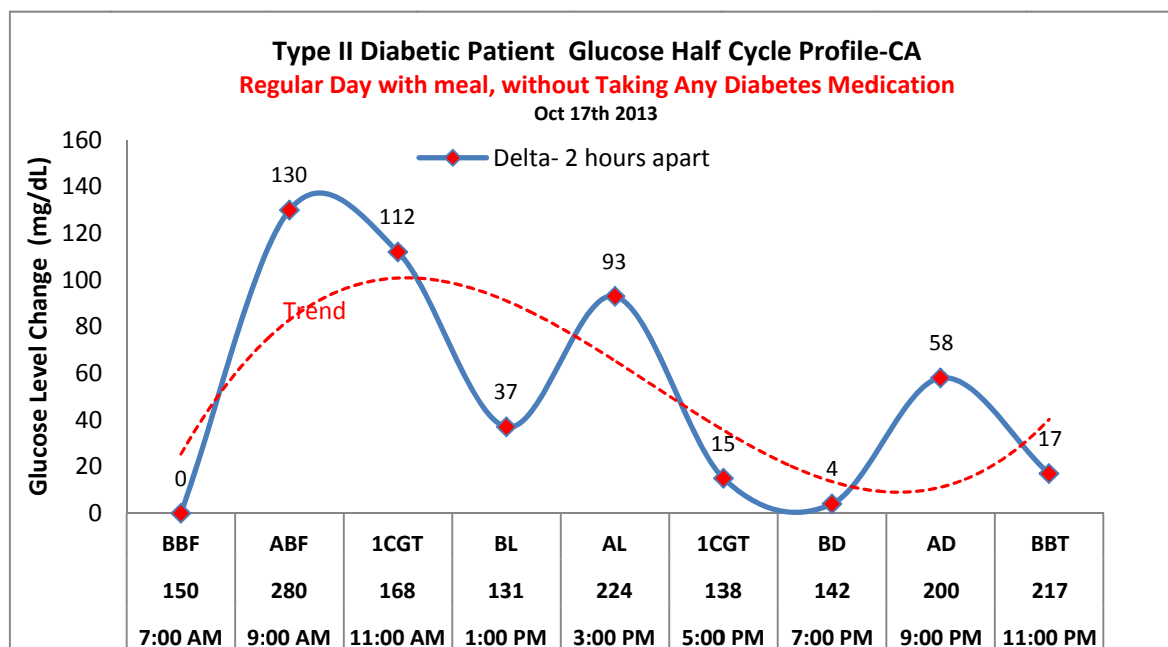
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If you experience low blood glucose (hypoglycemia) levels before a meal, you might experience a higher-than-normal spike over baseline levels; but this doesn't necessarily indicate an abnormal rise. It is normal for the level of glucose in the blood to rise even in people who do not have diabetes. However, if the rise is too high, it can affect your quality of life today and contribute to serious health problems down the road.

Low blood glucose (hypoglycemia) is problematic in many ways. One of the body's typical responses to hypoglycemia is to speed up the rate at which the stomach empties. That means food digests and raises blood glucose even more rapidly than usual. While this is certainly desirable when you're low, it does contribute to post-meal spikes. Preventing hypoglycemia before meals and snacks, therefore, is yet another effective strategy for controlling post-meal blood glucose levels.

You can also get hypoglycemia if you take too much insulin for the amount of carbohydrates you eat or drink. For instance, it can happen after you eat a meal that has a lot of simple sugars, or if you miss a snack or don't eat a full meal, or if you eat later than usual.

For Type 1 diabetes, significant after-meal rises have been shown to **produce earlier onset of kidney disease and to accelerate the progression of existing retinopathy**, the eye problem most commonly associated with diabetes. In people with Type 2 diabetes, high blood glucose after meals is a risk factor for **cardiovascular problems**.



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So exactly how high is a too high spike after a meal? There is no universal consensus on this issue. The American Diabetes Association recommends keeping blood glucose below 180 mg/dl one to two hours after the start of a meal. The European Diabetes Policy Group recommends keeping it below 165 mg/dl at the peak, and the American Association of Clinical Endocrinologists and International Diabetes Federation suggest keeping it below 140 mg/dl after eating. However, no specific guidelines are provided by any of these groups for Type 1 versus Type 2 diabetes and insulin users versus non-users, or children versus adults.

If you want your HbA1C level to be as close to normal as possible, you need to pay attention to your after-meal numbers as well. When interpreting your numbers, take your pre-meal readings into account. For example, a pre-meal blood glucose of 210 mg/dl followed by a 2-hour post-meal reading of 240 mg/dl shows just a 30-point rise (not bad), whereas a 110 mg/dl followed by a 240 mg/dl shows a 130-point rise (bad).

