

Reactive hypoglycaemia post-gastric bypass

What is it?

Reactive hypoglycaemia (non-insulinoma pancreatogenous hypoglycemia syndrome) is a seemingly rare and potentially serious complication following gastric bypass. Normal glucose levels are between 4.4 to 6.1 mmol/L (82 to 110 mg/dL). The brain can only use glucose to function. If the blood glucose level falls too low, the brain cannot function! Diabetics who inject themselves with too much insulin, can develop reactive hypoglycaemia because insulin drops their blood glucose to very low levels. Low blood glucose levels can occur in certain patients after gastric bypass (exact number not known) and this can produce several symptoms of varied severity.

Table 1: Mild Hypoglycaemia (~blood glucose down to 4.0 mmol/L)





 Shaking	 Fast Heartbeat	 Sweating	 Hunger	<ul style="list-style-type: none">• Increased or sudden hunger• Feeling shaky, dizzy or nervous• Pounding heartbeat• Drowsiness, feeling tired• Sweating (cold and clammy)• Numbness or tingling around the mouth• Headache or stomach ache
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Table 2: Moderate Hypoglycaemia (~blood Glucose 2.5-3.9 mmol/L)









 Anxiety	 Nausea	 Headache	 Impaired Vision	<ul style="list-style-type: none">• Headache• Personality change• Irritability• Poor coordination• Confusion and/or difficulty concentrating• Slurred or slow speech
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Table 3: Severe Hypoglycaemia (~blood Glucose 0-2.4 mmol/L)

 Dizziness	 Irritability	 Drowsiness/Fatigue	 Unconscious	<ul style="list-style-type: none">• Dizziness• Irritability• Drowsiness / Fatigue• Seizures and / or convulsions• Loss of consciousness
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How do I find out if I have it?

If you think you may have low blood sugar after eating, you should measure your blood sugar level using a glucometer available at any pharmacy. Do the test an hour before a meal, a few minutes after eating, an hour afterward, two hours after, etc. Keep a food log and keep track of your blood glucose readings at all the various times before and after meals. Also track your symptoms and your glucose level during these symptoms.

If your blood glucose is less than 4 mmol/L (<82 mg/dL) at any one of these measurements, please call the bariatric clinic at 514-934-1934 extension 36687 for a follow-up visit. Bring the results you recorded with you.

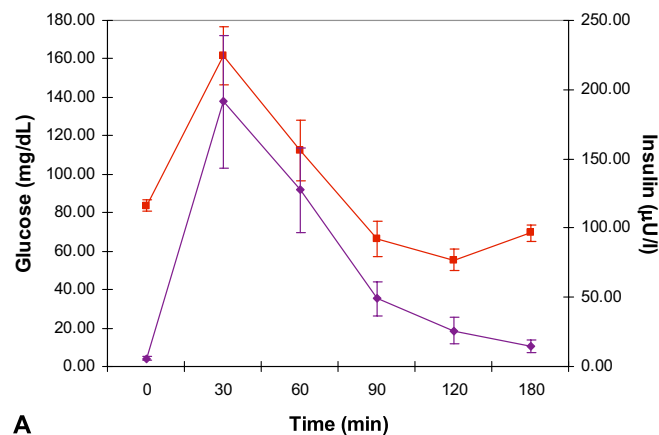
How is reactive hypoglycaemia treated?

You and the bariatric team need to understand what's going on with your body. Your food log including the times you eat and any blood sugar highs or lows on that same log will be used to spot any patterns that might develop. Over time you'll be able to spot trends and understand how your body is working a bit better.

Reactive Hypoglycaemia is manageable! Make sure you are following our dietary guidelines and instructions - eat protein first, then the complex carbohydrates and lastly the healthy fats.

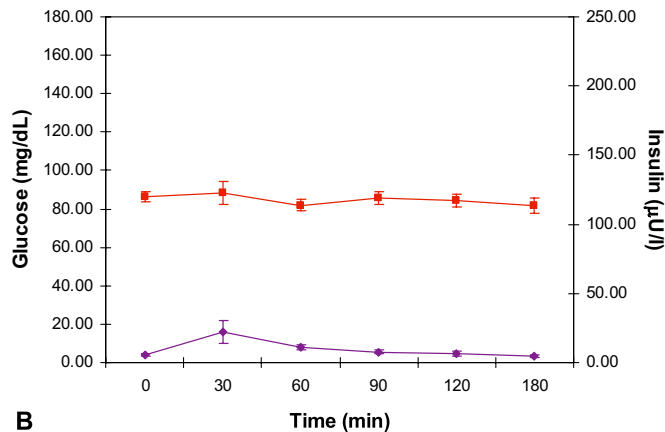
You will need to experiment with foods and figure out what YOUR triggers are, and what foods work BEST to bring you back from a sugar crash.

Here is what happens in experiment A, when 12 patients 2 years after gastric bypass suspected on Reactive hypoglycaemia, are given a **high carbohydrate meal** of 8 oz. of orange juice, 1 slice of toast with 1 tsp. of margarine and 2 tsp. of jam (79% carbohydrate, 11% fat and 10% protein, 405 calories) and their glucose and insulin levels are measured every 30 minutes for 3 hours:



Note the high peak of glucose (red) and insulin levels (purple) at 30 minutes and the drastic fall in glucose to below normal levels (<82 mg/dL) at 90 minutes.

Here is what happens when the same patients are given a **low-carbohydrate meal** was composed of decaffeinated black coffee or tea without sugar, 1 egg, a 1-oz. sausage patty, and a 1/2 oz. slice of cheese (2% carbohydrate, 74% fat and 24% protein, 415 calories).



Note how the glucose level (red) and the insulin level (purple) stay within normal levels and **DO NOT SPIKE WIDELY** as in experiment A. (The scientific reference for this study is: *T. A. Kellogg et al. / Surgery for Obesity and Related Diseases 4 (2008) 492– 499*)

What to do to control it

These experiments show us why we should not treat reactive hypoglycaemia like we do in diabetics.

For example, diabetics are asked to eat candy to bring their blood sugar up quickly from an overdose of insulin (the cause of their hypoglycaemia). That doesn't work well in reactive hypoglycaemia post gastric bypass. It will just cause a new cycle of crashes and sugar spikes. You need a **BALANCE** of nutrients, not sugar!

For most patients peanut butter crackers - or - a handful of grapes and a slice of cheese or a granola bar works the best.

The rule-of-thumb is a bit of simple carbohydrates to bring the crash up quickly, then a balance of protein and fat to keep the glucose up.

When out of the house carry a granola bar for emergencies.