Patient Information on Hydrogen Breath Test

A hydrogen breath test provides information about the digestion of certain sugars or carbohydrates, such as milk sugar (lactose) or fruit sugar (fructose). This will help determine if you are intolerant to certain sugars. One example is the use of this test to detect lactose intolerance, a disorder in which people have symptoms from abnormal processing of lactose, a substance in many foods including milk and ice cream. The test is also used for detecting abnormal growth of bacteria within the small bowel by having the patient ingest lactulose. Bacterial overgrowth can cause a variety of symptoms including diarrhea, bloating, gas, and abdominal cramps.

PREPARATION FOR THE TEST:

- For four (4) weeks before your test, you should not take any antibiotics.

- For one (1) week before your test, do not take any laxatives or stool softeners (for example Colace, Milk of Magnesia, Ex-Lax) or stool bulking agents (for example Metamucil or Citrucel). You should also not undergo any test that requires cleansing of the bowel, such as colonoscopy or barium enema.

- The day before your test:
  You may consume only the following foods and drinks: plain white bread, plain white rice, plain white potatoes, baked or broiled chicken or fish, water, non-flavored black coffee or tea. Only salt may be used to flavor your food. Butter or margarine is <u>not</u> permitted. Soda Pop/cola drinks are <u>not</u> permitted. DO NOT EAT OR DRINK ANYTHING ELSE – it could give false results for the test. Specifically, avoid beans, pasta, fiber cereals, high fiber foods. The night before the test, have an early dinner of rice and meat.

- For 12 hours before your test:
  You must stop eating and drinking 12 hours before the test.
  For example, if your test is at 9:00 a.m., you would stop eating and drinking at 9:00 pm the night before.
  You may continue to take your usual prescription medicines with water until 12 hours before the test.
  Take no medications the morning of your test.
  Please bring all prescription medications to your appointment.

- The day of your test:
  You should not eat or drink anything in the morning. You may take your medications with a small amount of water. If you are diabetic requiring insulin or diabetic pills, ask your physician if you should change your morning dose. Generally, half of your normal long acting insulin is given. Oral hypoglycemic medications are usually not taken that morning until completion of the test and resumption of eating meals.

  Two hours before the test, brush your teeth.

  DO NOT EAT, DRINK, CHEW GUM OR TOBACCO, SMOKE CIGARETTES, EAT BREATH MINTS OR CANDY BEFORE OR DURING THE TEST.

  Do not sleep or exercise while the test is being done.

- Your test may last for two to four hours. Please allow yourself sufficient time to complete you test.

The Test Procedure

- The technician will verify that you have not had anything to eat or drink after midnight
- A breath sample will be collected by having you exhale into bag.
- A solution of lactose, lactulose, or fructose will be given to drink. You should drink this whole amount.
- Breath samples will be collected every 15 minutes. After each sample is collected, the sample will be removed from the bag with a syringe, allowing collection of another sample into the bag.
- During the test, you should take notice of your symptoms and inform the technician if you have your typical symptoms for which the test is being performed.
- During the test, you should not eat, chew candy, smoke, sleep, or exercise.
- When the test is over, generally after two or four hours, you may leave. You may return to your usual diet and activity after the test.
- The samples will be processed in the afternoon. The report will be sent to your doctor.

Principles of Hydrogen Breath Testing

Hydrogen gas in the body is produced from intestinal bacteria. Bacteria, normally in the large intestine, produce hydrogen through fermentation of carbohydrates – such as lactose, lactulose, and fructose which are substrates given for the hydrogen breath test. Some of the hydrogen produced by bacteria is absorbed by intestinal mucosa whereby it enters the vasculature and is transported to the lungs. Hydrogen is then exhaled by the lungs by normal breathing. This is collected in the bag for subsequent analysis.

In small intestinal bacterial overgrowth, the small intestinal bacteria metabolize the lactulose given and produce an early rise in the breath hydrogen.

In lactose intolerance, the individual has a deficiency in lactase, the enzyme that breaks down lactose. Normally, lactose is broken down in the small intestine by lactase and very little lactose reaches the large intestine where the bacteria break it down to produce hydrogen. In lactose intolerance (lactase deficiency), the ingested lactose is not metabolized in the small intestine and reaches the colon where it is metabolized by colonic bacteria producing a large amount of hydrogen which is measured in the breath sample.