

Department of Paediatric Gastroenterology, Hepatology and Nutrition

Hydrogen breath test for sugar malabsorption

This leaflet explains hydrogen breath tests and describes what to expect when your child comes to Addenbrooke's Hospital for one of these tests.

A hydrogen breath test is a non-invasive, safe and painless way to investigate if your child is unable to digest sugar properly (malabsorption). This is known as intolerance. Examples of sugars include lactose, sucrose, and fructose.

What is a hydrogen breath test?

This test is carried out to check whether your child can properly absorb a specific sugar in their small bowel. The test actually measures a breakdown product of the sugar (hydrogen - as a gas) in your child's breath. If the sugar is not properly absorbed, it is fermented by bacteria in the bowel, and hydrogen is produced as a by-product. This is absorbed by the blood and then released in the lungs. Under normal circumstances there is no/very little hydrogen in your breath. This will remain unaltered if the sugar is absorbed in the small intestine. However, if your child has sugar 'intolerance' and does not absorb the sugar, the hydrogen level will increase in their breath. We will be able to measure this increase in your child's breath samples using a special monitor.

The test is time consuming; it lasts about three hours, so please bring something with you for you and your child to do.

What happens before the test?

- You will receive information about how to prepare your child for the test in your admission letter.
- If your child is under one year old, he or she will not be allowed to eat or drink anything (except for water) for six hours before the test. If they are over one year, they will not be allowed to eat or drink anything (except for water) for twelve hours before the test. It is important to follow these instructions otherwise your child's test may need to be delayed or even cancelled.
- If your child has any medical problems, particularly allergies or diabetes, please tell the nurse or doctor about these before you book the study date. Please also tell the team about any medications your child is currently taking.

What does the test involve?

- You will be able to stay with your child throughout the test.
- Your child must **not** eat or drink during this test.
- Your child will first be asked to brush their teeth, they will then need to blow into a special tube to get a baseline (normal) reading. If your child is too young to blow into the tube, the nurses will use a facemask instead.
- After the first sample has been taken, the nurses will give your child a sugar solution to drink.
- Breath samples will then be collected in the same way as the first one, every 30 minutes for three hours.

What happens after the procedure?

Once all the samples have been collected, your child will be allowed to eat and drink again, they will then be able to go home. If you have any concerns about your child you should contact the paediatric gastroenterology nurses, or if it is after 5.00pm your G.P.

What are the benefits?

The breath test will help to diagnose the cause of your child's symptoms in a non-invasive, safe and painless way.

Are there any risks?

- There are no significant risks associated with this test, although your child may not be able to drink all of the sugary solution, or may get some mild abdominal pain and/or diarrhoea if they do not absorb the sugar properly.
- This test is not 100% sensitive. About one in 20 children do not have any hydrogen-producing bacteria and therefore this test will be (falsely) negative (even if they develop symptoms after the test!).
- We will be observing your child closely during the test.
- As they will not be allowed to drink during the test, they may feel tired, irritable and thirsty, but they are unlikely to become dehydrated. The nurses will stop the test if they have any concerns about your child's well-being.
- It is important to complete the test so that we can get truly meaningful results. There is a tiny risk that your child could become dehydrated when you get home, especially if he or she is refusing food and drink, and/or vomiting, or develops diarrhoea. Signs of dehydration include:
 - Dry lips
 - Pale skin
 - Sunken eyes
 - Not passing urine.

You can prevent dehydration by giving your child regular, small drinks rather than one large drink. If you are worried, please call your GP or a member of the team.

How long will it take to get the results?

The results will be discussed with the referring consultant, we will then contact you to discuss a follow up plan. If your child's breath contains a large amount of hydrogen (more than 20 parts per million above your baseline) they are likely to be sugar intolerant. The baseline is the amount of hydrogen that is present in your breath before drinking the lactose solution. The nurse will discuss them with you, but you may have to wait to discuss them with your doctor and/or dietician before deciding on a management plan.

What are the alternatives to having the hydrogen breath test?

For diagnosing sugar malabsorption an alternative procedure to breath testing is a small bowel biopsy, where a sample of your child's small intestinal lining is taken using an endoscope (an instrument with a narrow flexible telescope attached). The amount of lactase is then measured. If the sample only contains a small amount of lactase, lactose intolerance is likely. Due to the invasive nature of a small bowel biopsy, which requires a general anaesthetic the procedure is rarely carried out to diagnose lactose intolerance. A second alternative is to give a dose of the specific dietary sugar that is being tested for, and observe an individual for symptoms. If the individual is intolerant, bloating, distension, pain, flatulence, and diarrhoea are likely to occur. A third alternative is a trial of a diet in which the potentially offending sugar is strictly eliminated.

What is lactose intolerance?

Lactose intolerance is the inability to digest lactose. This is **not** the same as being intolerant to 'milk/dairy', as that type of intolerance/allergy is due to a reaction to the protein in dairy. Lactose is the sugar found in milk and dairy products.

Intolerance to lactose is common and can occur in up to 20% of a population. It is a result of this fact that only infants and young children need to be able to digest milk products. Older children and adults can lose the ability to digest lactose as a normal part of their gut maturing. People with 'lactose intolerance' lose the enzymes required to digest lactose as they get older and can therefore develop the symptoms of sugar malabsorption (for example bloating, cramping, abdominal pain and diarrhoea).

How is lactose intolerance treated?

If your child's symptoms are caused by the consumption of lactose (most common in milk and dairy products), a dietician may be asked to discuss a lactose free diet with you. There are lactose-free dairy products available enabling your child to take dairy products, but avoid the lactose itself.

What is fructose/sucrose intolerance?

Some people are born with low levels of the enzymes/cells that absorb the different types of sugar in our diet. This only becomes obvious when children are weaned onto solid food that contains these sugars. It is not dangerous, but can lead to the same symptoms as lactose intolerance (see above). A dietician would be asked to discuss a fructose or sucrose free diet with you.

If you have any queries, please contact:

Mary Brennen, Helen Shelley or Lesley Dark, Tel: 01223 274757



We are currently working towards a smoke-free site. Smoking is only permitted in the designated smoking areas.

For advice and support in quitting, contact your GP or the free NHS Stop Smoking helpline on 0800 169 0 169

Help with this leaflet:



If you would like this information in another language, large print or audio format, please ask the department to contact Patient Information: 01223 216032 or

patient.information@addenbrookes.nhs.uk



Document history

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Department	Cambridge University Hospitals NHS Foundation Trust, Hills Road, Cambridge, CB2 0QQ www.cuh.org.uk
Contact number	01223 274757
Publish/Review date	March 2011/March 2014
File name	Hydrogen_breath_test_for_sugar_malabsorption.doc
Version number/Ref	2/PIN2001