

Hydrogen and Methane Breath Test

Information and advice for patients

GI Physiology

What is the test?

A hydrogen and methane breath test is a non-invasive safe test used to investigate intestinal disorders. It provides data about the digestion of certain sugars (carbohydrates), such as milk sugar (lactose). This will help find out if you are sensitive to these sugars. Also, the test is used for detecting abnormal growth of bacteria and archaea within the small bowel.

You will blow into a bag and your breath sample is analysed by a machine. The machine measures the amount of hydrogen and methane in your breath after fasting (not eating) overnight to get a baseline reading. Next you will drink a test solution so further breath samples can be taken at regular intervals for 3 hours. If the amount of hydrogen or methane in your breath rises during the test it will be a positive result.

Why do I need a Hydrogen and Methane Breath Test?

There are 2 reasons why a hydrogen and methane breath test is requested. They are described below, and the exact test will be stated in your appointment letter:

1. To Test for Small Intestinal Bacterial Overgrowth

It is normal for bacteria to live in your large intestine as they aid digestion. However, the small intestine does not usually contain bacteria. Sometimes bacteria can grow in the small intestine and interfere with the digestion of food; this is a condition known as 'small intestinal bacterial overgrowth' (SIBO).

When bacteria digest sugar they produce hydrogen, which escapes from the gut via the lungs. By measuring the hydrogen in your breath after a sugary drink, we can see if small intestinal bacterial overgrowth is the cause of your symptoms. Bacterial overgrowth can cause a variety of symptoms including diarrhoea, bloating, gas, and abdominal cramps.

In some people archaea can be present, these are like bacteria, but produce methane. This methane also escapes from the gut via the lungs. By measuring methane, we can see if an overgrowth of archaea is present, which is called intestinal methanogenic overgrowth (IMO). IMO has been linked to constipation.

2. To Test for Lactose Intolerance

Lactose is a natural sugar found in milk. Lactose intolerance means your body cannot break down lactose. The problem is usually caused by a lack of lactase. Lactase is an enzyme (a protein that causes a chemical reaction to occur) that is normally produced in your small intestine.

If your body produces very little or no lactase it will be unable to break down the lactose in your digestive system. The unabsorbed lactose passes through your stomach and small bowel into your large bowel. Bacteria and archaea in your large bowel then react to the lactose,

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producing gases including hydrogen and methane. This can cause symptoms like stomach bloating and wind. By measuring the hydrogen and methane in your breath we can see if lactose intolerance may be the cause of your symptoms.

What are the benefits?

The tests find out how your body digests certain sugars which can be the cause of your symptoms.

What are the risks?

The test drink is a sugar solution e.g. lactose, glucose, or lactulose, because of this the test can cause some your symptoms to occur, such as stomach bloating, wind, or diarrhoea.

Are there any alternatives to this treatment/operation/test?

These tests are the only tests used to investigate these problems.

Preparing for the test

Please read this information leaflet. Share the information it contains with your partner and family (if you wish) so they can support you.

- **For 4 weeks before your test:** You should not take any antibiotics. If you are prescribed antibiotics by your doctor within 4 weeks of your appointment it is important you take them. Contact the department to let us know and we will rearrange your breath test appointment.
- **For 1 week before you test:** You should also not undergo any test that requires bowel preparation, such as colonoscopy or barium enema.
- Do not take any laxatives, stool softeners or stool bulking agents.
- Do not take drugs for treating constipation or to prevent being sick such as, Metoclopramide, Domperidone, Prucalopride or Linaclotide.
- **For 2 days before you test:** do not take drugs to treat diarrhoea such as, Loperamide.

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The day before your test:

Consume only a low fibre diet. When preparing meals use small amounts of oils, and salt and pepper for flavouring only. Examples of foods include:

Foods allowed	Foods to avoid
Meat e.g., chicken, turkey, lean beef, pork (without batter, breadcrumbs, or pastry)	All fruit (including dried fruits like raisins)
Baked, boiled, grilled, or tinned fish – e.g., cod, plaice, salmon, or tinned tuna, mackerel, or sardines	All vegetables including salad
Tofu, Seitan	Quorn products
White bread	Wholemeal, granary, brown and high fibre white breads
Plain white rice	Baked beans and lentils
Peeled potatoes	All nuts and seeds
Marmite / Vegemite	Dairy foods (and vegan alternatives) including milk, cheese, ice cream, yogurt, and butter.
	Confectionary including sweets and chocolate
Drink water, non-flavoured black coffee, or tea, without milk or non-dairy alternatives.	Fruit juices, vegetable juices, flavoured squash, fizzy drinks, alcohol

Meal suggestions

Breakfast

- Scrambled eggs / tofu on white toast (no butter)
- Bacon sandwich on white bread (no ketchup, no butter)
- White toast and marmite (no butter)
- Coffee / tea (No milk or non-dairy alternative)

Lunch

- Tuna mayo wrap on white tortilla bread (no butter or salad)
- Plain omelette
- Tinned sardines on white toast (no butter)

Dinner

- Grilled chicken, white rice
- Baked fish and mashed potatoes without the skins (no butter / cream)
- Egg / Tofu fried rice (no veg)

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The night before your test:

- If your appointment is between 8:30am - 9:30am you must stop eating, drinking, smoking, and vaping from 8pm the night before the test.
- If your appointment is between 10:30am - 11:30am you must stop eating, drinking, smoking, and vaping from 10pm the night before the test.
- You may continue to take your usual prescription medicines with water until 12 hours before the test.

The day of your test:

- Take no medications the morning of your test.
- Please bring a list of all prescription medications to your appointment.
- Do not eat or drink anything in the morning. If you are diabetic requiring insulin or diabetic pills, ask your physician if you should change your morning dose.
- On the morning of the test please brush your teeth.

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

- Do not sleep or exercise while the test is being done.
- Your test may take up to 3 hours 30 minutes. Please allow yourself sufficient time to complete the test.

Where do I go?

The test will take place in the Outpatients department at Sandwell Hospital. Clinic 6B is on the 1st floor. On arrival, please check in at the **Endoscopy Unit Reception desk**. You will be asked to take a seat in the waiting area. The scientist will then take you into a private room and discuss the test with you.

During the test

What should I expect?

- We will explain the tests in full and obtain your consent to proceed with the test. This is important as we must seek your consent for any procedure beforehand. The scientist will explain the risks, benefits, and alternatives before they ask for your consent. If you are unsure about any aspect of the tests proposed, please ask for more information and the scientist will be happy to provide this.

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- You will blow into a bag and your breath sample will be analysed by a machine which measures the amount of hydrogen and methane in your breath (you will do this 2 times to take a baseline reading). The breath samples are collected whilst you are blowing at your normal rate, therefore this should not make you short of breath.
- Providing you have fasted correctly; the first readings should be very low. If this reading is excessively high, we may have to abort the test and rebook it for another day.
- You will drink the test solution (either lactulose, glucose, or lactose)
- Breath samples will be collected at regular intervals for up to 3 hours. You can bring something to read to pass the time.
- After the test has finished you can go back to work or home.

After the test

Following the test, you will be able to go home. You do not need anyone with you and your ability to drive will not be affected. You will be able to go straight back to your normal routine. You may eat and drink as normal and restart any medication that was stopped for the tests.

The results of the test will be sent to the consultant in charge of your care. They will then decide on your treatment plan.

Contact details

If you have any questions about the tests, please contact the GI Physiology Department:
0121 507 2490

The department is open Monday – Friday 8am to 4pm.

Further information

Patient UK

Small Intestinal Bacterial Overgrowth

<https://patient.info/news-and-features/what-is-small-intestinal-bacterial-overgrowth-sibo>

NHS Website

Lactose Intolerance

<http://www.nhs.uk/Conditions/lactose-intolerance/Pages/Introduction.aspx>

NHS Website

Irritable Bowel Syndrome

<http://www.nhs.uk/Conditions/Irritable-bowel-syndrome/Pages/Symptoms.aspx>

(Websites accessed 19 January 2024).

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Sources used for the information in this leaflet

- British Society of Gastroenterology (2023) *Association of gastrointestinal physiologists (AGIP) proposed standardised testing protocol for hydrogen/methane breath testing (HMBT) to assess small intestinal bacterial overgrowth (SIBO) and carbohydrate malabsorption*. [Online] Available at: <https://www.bsg.org.uk/clinical-resource/association-of-gastrointestinal-physiologists-agip-proposed-standardised-testing-protocol-for-hydrogen-methane-breath-testing-hmbt-to-assess-small-intestinal-bacterial-overgrowth-sibo-and-carboh/> (Accessed 19 January 2024).
- Rezaie, A., Buresi, M., Lembo, A., Lin, H., *et al.* (2017). Hydrogen and Methane-Based Breath Testing in Gastrointestinal Disorders: The North American Consensus. *The American journal of gastroenterology*, 112(5), 775–784. <https://doi.org/10.1038/ajg.2017.46>

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