

Mannitol Challenge Test

Information and advice for patients

Respiratory Physiology

What is the test?

A mannitol challenge test is a diagnostic test used to assess how sensitive your airways are. By inhaling mannitol powder, via an inhaler, and performing serial breathing tests after each dose, we can assess if there has been a significant response within the airways. Mannitol is a naturally occurring sugar used as a sweetener or within medication.

What are the benefits?

The benefits to having the test performed are to help clinician's rule out, diagnose and plan treatments if required

What are the risks?

- When inhaling Mannitol you may feel an increase need to cough as it is a dry, fine powder. Dependent upon the sensitivity of your airways you may feel an increase in breathlessness, chest tightness and wheeze. An inhaler or nebuliser at the end of the test to help with the above side effects, this in itself may cause tremor, an increased heart rate and/or palpitations.
- Other common side effects include feeling sick, headache, sore nose and throat and discomfort when swallowing, runny nose and vomiting.
- Some uncommon side effects include; cold hands and feet, diarrhoea, feeling dizzy, jittery, thirsty, tired, flushing and sweating, hoarseness, itching and rash, itchy eyes, less oxygen in the blood, mouth ulcers, nosebleeds, stomach pain, sore muscles and joints.

Please be aware that although very rare, all medications carry a risk of an allergic reaction.

When performing serial spirometry tests you may feel:

- dizziness
- breathlessness
- experience coughing
- feeling faint

What are the risks of not having the test?

If you decide you do not want to perform these tests then that is okay, we can only perform tests if patients are happy to consent to performing them. If you decide you do not want to perform the tests we will not be able to pass important information to your referring health professional which may affect the medical treatment that you receive

Are there any alternatives to this test?

There are other tests that can assess your lungs and airways in different ways but may not measure the sensitivity within your airways as originally requested. Any alternative test would require a new referral made by your referring healthcare professional.

Preparing for the test

- Do not smoke for 24 hours prior to testing
- Do not consume alcohol for a least 4 hours prior to appointment
- Please avoid eating a large meal within 2 hours of testing, however a small meal is appropriate
- Do not partake in vigorous exercise in the 30 minutes prior to appointment
- Please wear comfortable non restricting clothing

Withholding Medication

Please continue taking any other medication not listed below, as normal. If you are unable to withhold, please contact the department to discuss.

Time to Withhold	Medication
6-8 Hours	INHALED NON-STEROIDAL ANTI-INFLAMMATORY AGENTS e.g. sodium cromoglycate, nedocromil sodium
8 Hours	SHORT-ACTING BETA2 AGONISTS e.g. salbutamol, terbutaline
12 Hours	INHALED CORTICOSTEROIDS e.g. beclomethasone, budesonide, fluticasone
12 Hours	IPRATROPIUM BROMIDE
24 Hours	INHALED CORTICOSTEROIDS PLUS LONG-ACTING BETA2 AGONISTS e.g. fluticasone and salmeterol, budesonide and formoterol
24 Hours	LONG-ACTING BETA2 AGONISTS e.g. salmeterol formoterol
24 Hours	THEOPHYLLINE
72 Hours	TIOTROPIUM BROMIDE
72 Hours	ANTIHISTAMINES e.g. cetirizine, fexofenadine, loratadine
4 Days	LEUKOTRIENE-RECEPTOR ANTAGONISTS e.g. montelukas

Please contact the department if any of the following applies:

- You are allergic (hypersensitive) to mannitol or any of the other ingredient.
- You now have or used to have a swollen or weakened blood vessel around the heart or brain (aneurysm).
- You have high blood pressure which is not controlled by medicine
- You have had a heart attack in the last 6 months
- You have had a stroke in the last 6 months
- You are under 18 years of age
- You are pregnant (can be performed while you are breast feeding)

During the test

On arrival you should expect:

- Height and weight will be recorded to help us calculate reference ranges
- Risk factors assessed via pre-test questioning and contraindication assessment
- An explanation of the test prior testing
- Answer any questions you may have regarding the tests

We will firstly want to perform a fast blowing test called a spirometry. All breathing tests are performed via a mouthpiece connected to a testing piece of equipment to ensure accurate measurements are obtained. To ensure accurate testing you will also be wearing a nose peg during each test. You will be provided with clear, concise instructions while performing the tests to ensure valid tests are obtained. We will ask you to breathe normally for a few breath cycles, followed by a big breath in to fill the lungs and a sharp fast blow out until your lungs are empty. We will use these tests as the baseline measurements to compare to throughout the test. We will then prepare the first capsule to inhale through an inhaler, after a short amount of time we will ask you to repeat the fast breathing tests again. After each breathing test we will compare to baseline and previous attempts. This cycle of inhaling mannitol, followed by performing fast blows will continue until you have either; reached the end of the test, had a 10% change in the amount of air you can breathe out in the first second between doses or 15% change in the amount of air you can breathe out compared to the baseline. You will then be given a Salbutamol nebuliser to reverse any impact upon your airways. We will repeat the fast blowing test again to ensure your lung function is back to baseline.

After the test?

The testing physiologist will inform you of the follow up process and you are then able to continue with your day as normal.

Follow-up

Your test results will be sent to the referring healthcare professional who is responsible for discussing the result of these tests with yourself. Please note, none of your tests results will be discussed on the day of testing.

Contact details

Respiratory Physiology Sandwell: 0121 507 3666

Respiratory Physiology City: 0121 507 4298

Respiratory Physiology MMUH: 0121 507 4650

Further information

<https://www.artp.org.uk/patients>

<https://www.asthmaandlung.org.uk/>

Sources used for the information in this leaflet

National Institute for Health and Care Excellence (2024). Asthma: diagnosis, monitoring and chronic asthma management (BTS, NICE, SIGN) [NICE Guideline NG245]. London: NICE. Available at: <https://www.nice.org.uk/guidance/ng245> [Accessed 16 June 2025].

Association for Respiratory Technology & Physiology (2020). ARTP Statement on pulmonary function testing 2020. [Online]. Available at: <https://bmjopenrespres.bmj.com/content/7/1/e000575> [Accessed 16 June 2025].

Pharmaxis Europe Limited (Unknown). Osmohale Leaflet. Available in Mannitol Test Kit Box.

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Incorporating the Midland Metropolitan University Hospital, City Health Campus, Sandwell Health Campus and Rowley Regis Hospital.

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M7589

Issue Date: August 2025

Review Date: August 2028