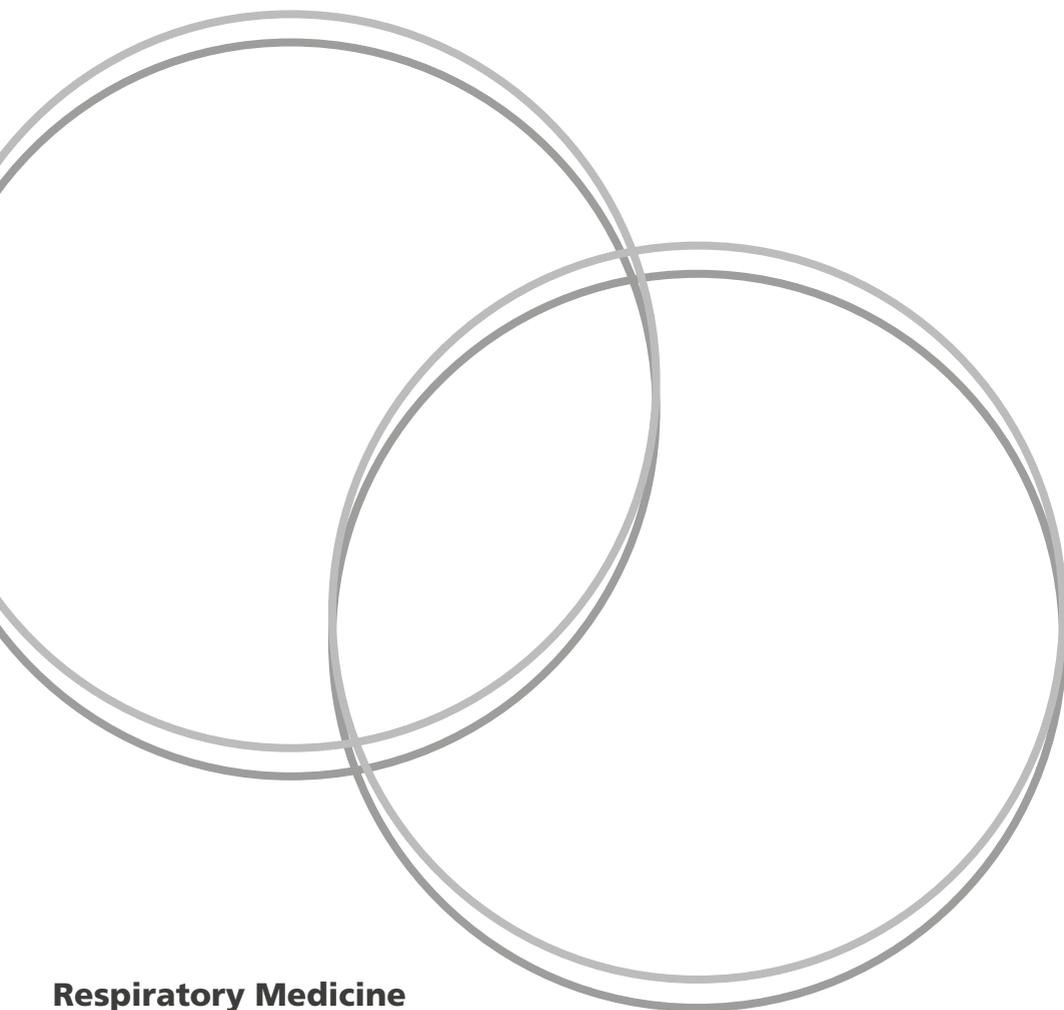


# Methacholine Challenge Test

Information for patients



## **Why have I been asked to have a Methacholine Challenge Test (MCT)?**

This is a test of airway responsiveness. The test looks at how 'twitchy' your airways are, by seeing whether they narrow after inhaling (breathing in) a substance called methacholine.

We assess the effect on your airways by asking you to exhale (breathe out) forcefully into a breathing machine (spirometer). The machine can usually detect airway narrowing before you become aware of it. The effect of the methacholine is easily reversible once the test is complete. The test takes between 20 to 60 minutes.

If you have asthma your airways will narrow when you breathe in the methacholine. This is detected by the spirometry machine as a drop in lung function.

## What happens during the MCT?

During the MCT, you will inhale a very low dose of methacholine from a nebuliser. Nebulisers are used to turn liquid medicines into a fine mist, which can be inhaled into the lungs. You will then be asked to perform the breathing test.

If your breathing does not change with the first dose, you will be asked to inhale gradually stronger doses of methacholine, until you have a significant drop in lung function or develop symptoms (see step 7).

If your airways tighten at any point, you will be given a bronchodilator medicine (either salbutamol or ipratropium), which can be breathed in and will re-open your airways. Often, the respiratory physiologist or severe asthma nurse doing the test will know that your airways are tightening before you feel it, by seeing a drop in your breathing test results.

## How is the MCT carried out?

The steps for a methacholine challenge test are as follows:

- 1.** You will do a spirometry test, to see what your baseline lung function is. If your lung function is not too low, you will move to the next step of the challenge test.
- 2.** In this step, you may or may not be asked to breathe a saline (salt water) solution through a nebuliser, before repeating the spirometry test.
- 3.** If your lung function does not change, you will be asked to breathe in a very low dose of methacholine through a nebuliser.
- 4.** You will repeat the spirometry test immediately after inhaling the methacholine, and again a few minutes later.
- 5.** If your lung function does not change after the lowest dose of methacholine, you will inhale another dose of methacholine that is a little stronger. You will then do the spirometry test again.

6. As long as you do not react to the methacholine, you will continue the test; inhaling stronger doses of the methacholine (usually between 5 to 10 doses in total), followed by spirometry testing.
7. As soon as your lungs show a significant drop in lung function (a drop in forced expiratory volume at 1 second (FEV1) of 20% or more) the test is considered complete. The concentration of the methacholine given at this point will be your test result. If you have the maximum dose of methacholine and still do not have a drop in function or symptoms, this last dose will be the result.
8. You will then be given a bronchodilator treatment (usually Salbutamol or Ipratropium) to inhale, which will help reopen your airways.
9. You will then repeat the spirometry test to make sure your lung function has returned to normal.
10. We will need to monitor you for an hour or so, to make sure your breathing is completely back to normal.

## **Preparing for the MCT**

Before the test, to help us get the most accurate results, please follow these instructions:

- Please read the 'Inhalers and other medication' section.
- On the day of the test, do not eat or drink any products containing caffeine, such as coffee, tea, cola drinks, energy drinks, or chocolate. The caffeine in these products can act as a weak bronchodilator and cause inaccurate test results.
- Wear loose fitting clothing to your appointment, to allow your chest to expand freely. You will be asked to take deep breaths in and blow out hard during the tests.
- Do not take part in any vigorous exercise for 30 minutes before the appointment. This may tire you out too much before the tests.
- Do not eat a large meal within 2 hours before the test. This may make you feel uncomfortable whilst taking the tests.

## **Inhalers and other medication**

Your respiratory doctor may ask the respiratory physiologist or severe asthma nurse to check your breathing response to certain types of inhaled medication. This will be done by measuring your breathing before and after taking inhalers or nebulisers.

To get more accurate readings, you will need to stop using certain inhalers or medications that control your chest conditions, for a limited time before the tests.

Please bring your current inhalers to your appointment, along with a list of any other medication you take regularly.

Also make a list of any over the counter medications or herbal remedies you are taking for your breathing or for sinus congestion or allergies.

If you find it difficult to manage without your inhaler, please continue to use your reliever inhaler (short acting bronchodilator). Tell us when you arrive what you have used and when you last used it.

You can take all other medication as usual.

Medication name:	Examples of brand names:	How long to stop medication for before lung function tests:
<b>Short-Acting Bronchodilators Inhalers and Nebules</b>		
Salbutamol	Airomir, AirSalb, Salamol, Ventolin	4 hours
Terbutaline sulphate	Bricanyl	
Ipratropium bromide	Atrovent	24 hours
<b>Long-Acting Bronchodilator Inhalers</b>		
Formoterol	Atimos, Foradil, Oxis	24 hours
Salmeterol	Serevent, Soltel	
Acclidinium	Eklira	24 hours
Glycopyrronium	Seebri	
Indacaterol	Onbrez	48 hours
Olodaterol	Striverdi	
Tiotropium	Braltus, Spiriva	
Umeclidinium	Incruse	
<b>Long-Acting Bronchodilator (within combination inhalers)</b>		
Formoterol	Bevespi, DuoResp, Flutiform, Fostair, Fobumix, Luforbec Symbicort, Trixeo	24 hours
Salmeterol	Aerivio, AirFluSal, Aloflute, Sereflo, Sirdupla, Seretide	
Acclidinium	Duaklir	24 hours
Glycopyrronium	Bevespi, Trixeo, Trimbow	
Indacaterol	Ultibro	
Tiotropium	Spiolto	48 hours
Umeclidinium	Trelegy	
Vilanterol	Anoro, Relvar	

Medication name:	Examples of brand names:	How long to stop medication for before lung function tests:
<b>Antihistamines – Tablets or Capsules</b>		
Acrivastine	Benadryl	3 hours
Cetirtzine	Zirtek	
Chlorphenamine	Piriton	
Desloratidine	Neoclarityn	
Loratidine	Clarityn	
Fexofenadine	Telfast	
<b>Other Medication – Tablets</b>		
Montelukast	Singular	24 hours
Theophylline	Uniphyllin Continus	48 hours

## Coming for the tests

Before the tests start, the respiratory physiologist or severe asthma nurse will ask you some questions. These are to check whether there is a medical reason why you should not do the test.

Please tell us if any of the following apply to you:

- You have coughed up any blood in the last two months.
- You have had any surgery in the last two months (including eye surgery).
- You have taken any medicine for chest pain in the last month.
- You have been told by a doctor that you have a blood clot.
- You have had a heart attack in the last three months.
- You have had a stroke in the last three months.
- You have a current chest infection requiring antibiotic treatment, or have had a chest infection within the last two weeks.
- You have uncontrolled blood pressure.
- You have certain types of blood vessel problems (e.g. aortic or cerebral aneurysm).
- You have been told by your doctor that you have a collapsed lung, a broken or cracked rib, or a problem with your neck vertebrae.
- You have chest pain on the day of the test.
- You have had to go to the Emergency Department (for your own care) in the last 3 days.
- You are pregnant or breastfeeding.
- You feel unwell on the day of the test.

## **Are there any risks or side effects?**

The challenge test is designed to see if your airways tighten. If your airways do not tighten, you may have no symptoms at all.

If your airways do tighten during the test, you may have symptoms of your asthma worsening. You may cough, wheeze, feel tightness in your chest or be short of breath.

If the test results show that your airways are tightening, you will be given a bronchodilator (such as salbutamol or ipratropium) that will relieve the symptoms. The test is carried out in the lung function laboratory, with trained staff and a healthcare provider available.

If you have any chest pain or other problems, such as dizziness or feeling light-headed during the test, please tell the respiratory physiologist. They will stop the test and wait until you feel well enough to continue, or give you treatment if necessary.

## Contact details

If you would like more information, please contact the **Oxford Severe Asthma Clinic**.

Telephone: **01865 227 242**

(9.00am to 5.00pm, Monday to Friday)

Answerphone available outside of hours.

Email: [orh-tr.severeasthmaclinic@nhs.net](mailto:orh-tr.severeasthmaclinic@nhs.net)

# Notes

## Further information

If you would like an interpreter, please speak to the department where you are being seen.

Please also tell them if you would like this information in another format, such as:

- Easy Read
- large print
- braille
- audio
- electronic
- another language.

We have tried to make the information in this leaflet meet your needs. If it does not meet your individual needs or situation, please speak to your healthcare team. They are happy to help.

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