

Stress Testing

A stress test is most commonly used to objectively determine how the heart functions during stress or activity in a non-invasive way.

It can also sometimes be used to determine the presence or absence of symptoms in patients with other structural heart conditions.

The test usually involves walking on a treadmill or using an exercise bike. During the course of the test the speed and work required gradually increased to 'stress' the heart. On occasion a drug is administered through a drip to speed the heart up (for example when a patient is unable to perform the required exercise).

The most common types of stress testing include:

- Exercise treadmill testing (ETT)
- Stress echocardiography
- Perfusion cardiac MRI (CMR)

Exercise Treadmill Test (ETT)

How do I prepare for a ETT?

You will need to wear comfortable clothing with trainers. You may also be asked to avoid caffeine and also stop taking some medications (e.g. beta-blockers) before the test so that all measurements and interpretation of the results are as accurate as possible.

How long does the test take?

The test will take no longer than 20 minutes (including the set-up time) and recovery.

What is measured?

Throughout the test, your blood pressure, heart rate and also a continual ECG will be measured. Additionally you will be asked about symptoms including the presence or absence of chest pain or breathlessness

Are there any risks?

There is no significant risk from the test. Your symptoms will be carefully monitored during the test and will be stepped well before you get to a level where your heart is beginning to struggle.

Stress echocardiography

How should I prepare for a stress echo?

Wear clothing that allows for imaging of the heart. If the test is being performed with physical stress (e.g. exercise bike) then comfortable clothing and trainers are advised in addition. You will likely be asked to avoid caffeine and some medications (e.g. beta-blockers) for 24-48 hours prior to the test.

What is involved?

For an exercise stress echocardiogram (most commonly using an exercise bike) you will be asked to exercise and at intervals pictures of your heart will be taken.

If exercise is not possible then pharmacological stress may be used with administration of a drug (usually dobutamine +/- atropine) to stress and increased the heart rate. At intervals, pictures of your heart will be taken.

The test usually takes approximately 30 minutes including recovery time. If pharmacological stress is used, then you will be observed for an hour after the test to ensure all of the effects of the medication have worn off before you go home.

What is measured?

In addition to heart rate, blood pressure and monitoring of symptoms, echocardiography assesses how the heart muscle works both at rest and at maximal activity.

Are there any risks?

The test is very safe. There is a very small risk (<0.1%) of an adverse reaction to medication if pharmacological stress is administered. This can be managed at the time.

Stress MRI

How should I prepare for a stress CMR?

You will be asked to avoid caffeine for 48 hours prior to the test to ensure adequate stress. Please wear comfortable clothing.

Most people are suited to MRI, although there are some restrictions due to the strength of the magnet (e.g. with some implants). Prof Ruparelia shall discuss this prior to suggesting this investigation. The supervising radiographer / consultant will go through a final safety checklist before proceeding to the test.

What is involved?

Stress CMR involves the administration of contrast (Gadolinium) and adenosine (to stress the heart) to measure heart function both at rest and also under stress to determine adequacy of blood flow to the heart.

The test will take approximately 45 minutes and you will be asked to following instruction with regards to breathing to ensure that optimal images are obtained.

Are there any risks?

The test is very safe. There is a very small risk ($<0.1\%$) of an adverse reaction to either the contrast (Gadolinium) or the adenosine administered to induce stress. These can be simply managed at the time in the rare event of occurrence.