

What are the potential risks/ complications?

Adenosine is a safe and tolerable medication. Some people may experience minor side effects such as dizziness, headache, nausea, breathlessness and chest discomfort during the infusion of this medication. These symptoms are usually transient and resolve within a few minutes of stopping the infusion.

An asthmatic attack (only in patients who have pre-existing asthma) may occur but the symptoms are usually mild and short-lived. Occasionally, the asthmatic attack becomes severe and treatment is necessary. Rarely, a stress test may precipitate a heart attack or heart rhythm abnormality necessitating resuscitation and hospitalization.

Adenosine Stress Magnetic Resonance Myocardial Perfusion Imaging is very safe and well tolerated. Major side effects are very rare. Some patients may feel tingling sensations in the hands during the scan but this is harmless. During gadolinium injection, some patients may experience discomfort at the area of the injection, nausea/vomiting, a brief headache or metallic taste, but these are minor and transient. Please inform the doctor or radiographer if you experience any discomfort. Some patients with severe kidney impairment may develop a potentially serious complication called nephrogenic systemic fibrosis after receiving gadolinium contrast. For this reason, gadolinium administration is avoided in patients with severe kidney disease.

When will I know the results?

The scan images will need to be processed by computers and need some time to be analyzed to detect any abnormality. Your doctor will inform you of the final report at your next clinic appointment. If there is any severe abnormality that requires prompt medical attention, your doctor will be informed and you may be contacted immediately.

CONTACT INFORMATION

***Imaging Centre (Magnetic Resonance Imaging)**
Kent Ridge Wing, Level 3

Opening Hours: 8.30am – 6.00pm (Mondays to Fridays)
Closed on Saturdays, Sundays and Public Holidays

For appointments/ enquiries, please contact
Tel: (65) 6772 5201 Email: ddi_enquiries@nuhs.edu.sg

GETTING TO NUH



By BUS

- From Ayer Rajah Expressway (AYE) Bus Stop, you can take : SBS Transit Bus Service No. 97, 197, Express 507, SMRT Bus Service No. 963
- From Bus Stop after AYE Exit 8 (road connecting to North Buona Vista Road), you can take: SBS Transit Bus Service No. 14, 33
- From North Buona Vista Road Bus Stop (outside Science Park I), you can take: SBS Transit Bus Service No. 92, 200

By TRAIN

The Circle Line Kent Ridge Station is at our door step.

Information in this brochure is given as a guide only and does not replace medical advice from your doctor. Please seek advice of your doctor if you have any questions related to your surgery, your health or medical condition.

Information is correct at time of printing (April 2012) and is subjected to revision without notice.

Adenosine Stress Magnetic Resonance Myocardial Perfusion Imaging

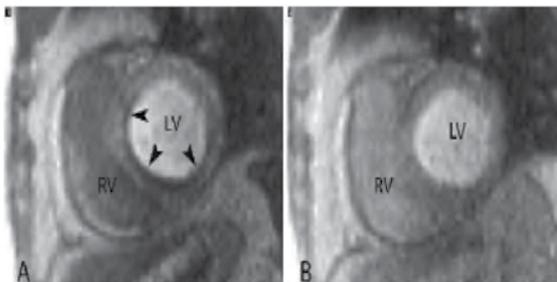


What is Adenosine Stress Magnetic Resonance Myocardial Perfusion Imaging

Blood vessels supplying the heart (also called coronary arteries) can be abnormally narrowed by a process called *atherosclerosis*. When this happens, the blood flow to the heart may be insufficient during times of stress (such as during physical exertion). A myocardial perfusion test assesses the blood flow (*perfusion*) to the heart muscles (*myocardium*). This technique detects areas of the myocardium with impaired blood flow.

Magnetic resonance imaging (MRI) is a non-invasive imaging method to assess myocardial perfusion, heart structure and function. It relies on a strong magnetic field to create images of the heart and surrounding structures in the chest. It is able to assess the perfusion of the myocardium by imaging the passage of a blood contrast material called *gadolinium* through the myocardium.

Physical exercise is usually employed to “stress” the heart. During exercise, normal coronary arteries dilate to increase perfusion of the myocardium but abnormal atherosclerotic arteries may not dilate sufficiently to provide adequate blood supply to the myocardium, resulting in a state of *myocardial ischaemia*. Some people may be unable to exercise due to various reasons, such as joint aches or poor general health. In such situations, a vasodilator medication, such as *adenosine*, is administered to dilate the coronary arteries and simulate the condition of stress.



Magnetic resonance myocardial perfusion images of the ventricles in short axis (cross section) views. Panel A shows a dark rim of myocardial perfusion (blood flow) abnormality as indicated by the arrowheads in a patient with narrowing of the right coronary artery. Panel B shows the myocardial perfusion image of a patient with normal coronary arteries - there is no perfusion abnormality in this case. LV indicates left ventricle; RV, right ventricle.

What is the purpose of this test?

This test assesses the blood flow to the heart muscles and detects the presence of myocardial ischemia. In addition, cardiac MRI produces high resolution images of the heart that allows visualization of abnormal structure and function. It is also able to detect areas of damage or scarring in the heart muscles. This important information helps a doctor in diagnosis and treatment of a patient with suspected coronary heart disease.

What can I expect?

Your doctor would have gone through a checklist with you to determine your suitability for this test before the scan. The procedure will be explained to you, and you will be required to sign a consent form before proceeding with this test. The MRI scanner is a large, cylindrical magnet situated in a specially constructed room. Before entering the scanner room, you will be asked to change into a gown and to remove all metallic objects and clothing with metallic material. Your height and weight will be taken and two small plastic needles or cannulae will be inserted in the veins on each of your arms for injection of gadolinium contrast and adenosine.

Inside the MRI scanner room, you will lie down comfortably on the scanner table. ECG electrodes will be placed on your chest (this may require shaving of the chest in order to obtain a good ECG signal). A blood pressure monitoring cuff will be wrapped around one of your arms. The injectors for the adenosine and gadolinium will be connected to the cannulae in your arms. A lightweight device is then placed over your chest to receive the image signal from your body. Finally, you will be given headphones or earplugs as the scanner makes vibrating noises during image acquisition.

The couch will then move to the centre of the scanner and you will need to lie still for the duration of the scan (usually about 45 to 60 minutes). During the test, your heart rate, heart rhythm and blood pressure will be closely monitored. You will be in contact with the scanner operator and doctor at all times, and you will be regularly asked how you feel. During image acquisition, you are required to hold your breath, usually for about 6 to 15 seconds. You will be given clear breathing instructions throughout the scan.

After the scan, you will be monitored for at least 15 minutes before you leave.

Please ask any of the attending staff if you have any question, and inform them if you feel unwell at anytime during the test.

How do I prepare for this test?

1. Avoid caffeinated food and drinks, such as soft drinks, coffee, tea and cocoa, for at least 12 hours before the test as caffeine may reduce the effectiveness of the vasodilator medication adenosine.
2. Asthmatic patients should not undergo this test as adenosine can precipitate an asthma attack. Please inform your doctor if you are suffering from asthma.
3. Omit your heart medications on the morning of the test, but bring them with you so that you can take them after the test.
4. You should preferably fast (no food and drinks) for 2 hours prior to the test to avoid feeling nauseous during the test. If you are unable to fast, please inform the staff at the MRI Centre.
5. You should not undergo this test if you have fever, viral and other concomitant acute illnesses or if you feel unwell on the day of the test. Please check with your doctor.
6. Avoid smoking for at least 6 hours before the test.
7. It is important that you inform your doctor before the scan if you are pregnant or have the following:
 - A heart pacemaker *and/or* have defibrillator
 - Had brain surgery or vascular clips in the brain
 - Implants or metal in your body
 - Metal fragments in your eye
 - Claustrophobia (fear of being in enclosed spaces)
 - Kidney impairment or failure

Do leave jewellery at home. You may bring a music CD to listen to during the scan. You must not bring any metallic object into the scanner room at any time.