



INFORMATION FOR REFERRING MEDICAL PRACTITIONERS

Imaging the Heart with CT

Advances in CT scanning technology have resulted in the latest generation of CT scanners being able to rapidly generate high-resolution images of the heart including the coronary arteries. At its St George's Radiology site, the Christchurch Radiology Group has a Siemens SOMATOM Definition Dual Source 64-slice scanner, one of the fastest cardiac CT scanners available, and the first of its kind in New Zealand. In comparison to older technology, images of the heart can be acquired with shorter scan times, less intravenous contrast and lower radiation doses.

Heart Vision – State-of-the-Art Technology & a Multidisciplinary Team combined

Heart Vision is a joint venture between the Christchurch Radiology Group and Heart Centre (2003) Ltd. It brings together the state-of-the-art CT technology at St George's Radiology, and the combined expertise of Radiologists and Cardiologists specialising in imaging and caring for cardiac patients to provide a comprehensive cardiac CT service.

CT Coronary Angiography

A CT coronary angiogram is a non-invasive imaging alternative for the evaluation of coronary artery disease. In appropriately selected patients, studies with satisfactory image quality have a sensitivity for the detection of haemodynamically significant coronary stenosis of greater than 95%. In a small proportion of patients, CT coronary angiography does not provide satisfactory images, and further investigation may be required.

As CT coronary angiography utilizes intravenous contrast and radiation to generate images, it should only be performed where potential benefits outweigh the risks of contrast and radiation exposure.

Indications for CT Coronary Angiography:

- Patients with atypical chest pain at intermediate risk for coronary artery disease
- Patients with inconclusive stress test results
- Patients with at least intermediate risk for coronary artery disease, but no documented coronary artery disease
- Detection and evaluation of suspected coronary artery anomalies

CT Coronary Angiography is *not* appropriate for:

- Initial evaluation of symptomatic patients suspected of having coronary artery disease. These patients would typically still require and should be referred for a standard coronary angiogram.

Patients meeting any of the following the criteria should be discussed with a cardiologist prior to referral:

- Impaired renal function
- Allergy to intravenous contrast
- Irregular or rapid heart rates
- Known coronary artery disease (including previous bypass grafting, angioplasty or stenting) or extensive coronary calcification (older males with significant risk factors)
- Risk stratification prior to non-cardiac surgery
- Any patient <40 years of age

Advanced cardiac CT applications

- Evaluation of complex cardiac anatomy/congenital heart disease
- Evaluation of cardiac masses (tumour or thrombus) as an adjunct to echocardiography
- Evaluation of pericardial disease including constriction, cysts or masses as an adjunct to echocardiography
- Evaluation and follow-up of complex aortic disease (intramural haematoma (IMH), dissection, aneurysm, coarctation)



Are there any medical conditions that preclude patients from having CT Coronary Angiography?

CT coronary angiography should not be performed on patients who are or might be pregnant. Patients with pacemakers, defibrillators and arrhythmias may also be unsuitable. CT coronary angiography does require administration of intravenous contrast so is contraindicated without further discussion in patients with chronic renal insufficiency (a current creatinine level is required for all patients) or contrast allergy.

What preparation is required?

Patients are asked to withhold Cialis, Viagra and Levitra for 36hrs prior to the scan, and not to take drinks containing caffeine or alcohol on the day of the scan. Prior to the scan patients will be asked to read and sign an information and consent form.

How is the scan performed?

A CT coronary angiogram is an ECG gated contrast enhanced CT scan through the heart. Patients will be asked to lie on the scanner table. ECG leads will be attached to their chest and intravenous access will be obtained (usually via an antecubital fossa vein) for contrast injection. Immediately prior to the coronary scan patients may be given sublingual nitroglycerine. Patients will need to be able to hold their breath for up to 15 seconds while the coronary scan is acquired.

What are the risks?

There is a small risk of side effects and complications related to intravenous contrast administration including contrast allergy. Allergic reactions are usually mild (such as itch or a rash). Rarely severe reactions occur (<1 in 10,000).

CT coronary angiography exposes the patient to ionising radiation. The effective dose on the Siemens Definition scanner used is in the range of 5 to 15 mSv. This is in comparison to the effective dose from a Chest x-ray of 0.1 mSv, conventional diagnostic coronary angiography of 2 to 3 mSv, and annual natural background radiation of about 2 mSv. The risk of cancer from exposure to 1 mSv of radiation is about 1 in 17 000. This compares to a natural incidence of cancer of about 57 in 17 000.

In a small proportion of patients CT coronary angiography does not provide satisfactory images, and further investigations may be required.

How much does the examination cost?

The cost is \$1720 (GST inclusive). Health insurance may not cover the full cost of the examination and reimbursement may vary depending on whether referral is via a GP or specialist. Each patient should confirm their level of coverage with their insurer in advance of their appointment.

How long before the scan results are available?

The images acquired as part of a CT coronary angiogram include the equivalent of a limited range CT chest. A CT chest report will be issued on the day of the scan. Analysing the coronary artery images using a dedicated workstation and software (Circulation) is more time consuming and as a result, a final report including the angiogram report will be issued separately once the analysis is completed.

Important note regarding incidental findings:

Non-cardiac incidental findings are detected in 25%-60% of coronary angiogram scans, with pulmonary nodules being amongst the most common. All patients should be aware that further investigation and follow-up of incidental findings might be required.

Heart Vision

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