

AUCKLAND HEART GROUP

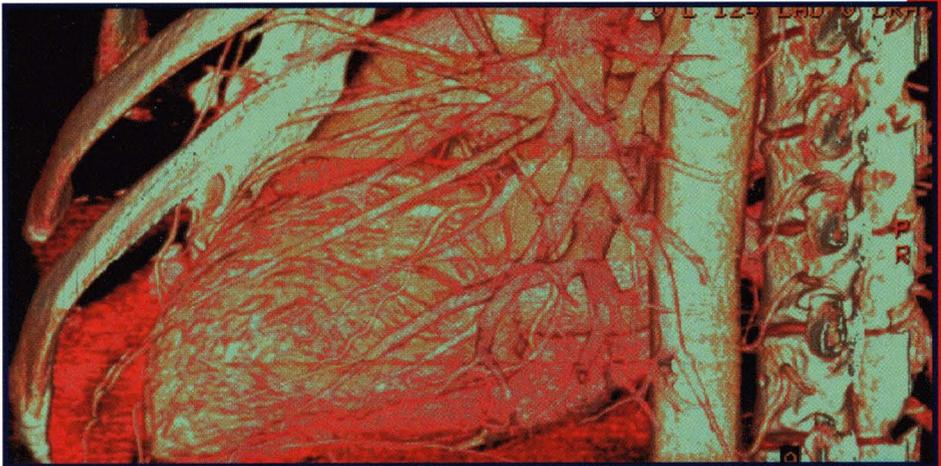


CT Angiography



What is 64-Slice Coronary CT Angiography?

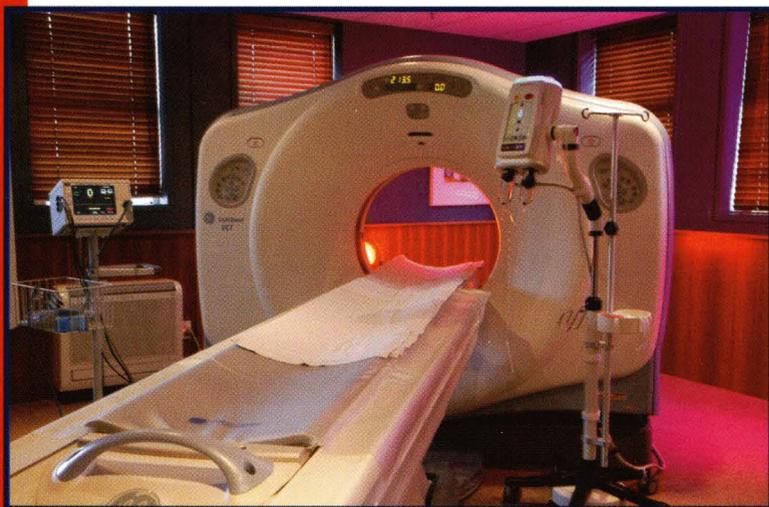
CT coronary angiography (CTA) is state-of-the-art, very fast imaging technology, that takes multiple X-ray cross-sections of the heart (like slices of bread). The whole heart can be imaged in approximately five heart beats. A computer then assembles the cross-sectional images into a detailed picture of the heart. It is “non-invasive” because the body is not physically entered except for a cannula in the arm used to give contrast dye. This contrast dye fills the arteries and the heart chambers briefly making them visible on X-ray pictures. The arteries that take blood to the heart muscle are called coronary arteries and the CT pictures give information about narrowings, fat deposits and calcium in the arteries. In addition, CTA gives information about heart muscle function, valves, and the pericardial sac that encloses the heart. The 64 slice scanner can take so many pictures so quickly that excellent images of cardiac structures down to less than a millimeter in size can be examined. The cardiologist is provided with extensive information that helps determine patient management and thus may prevent heart attacks and cardiovascular death.



A 3-Dimensional reconstruction of the heart and great vessels inside the thoracic cavity.

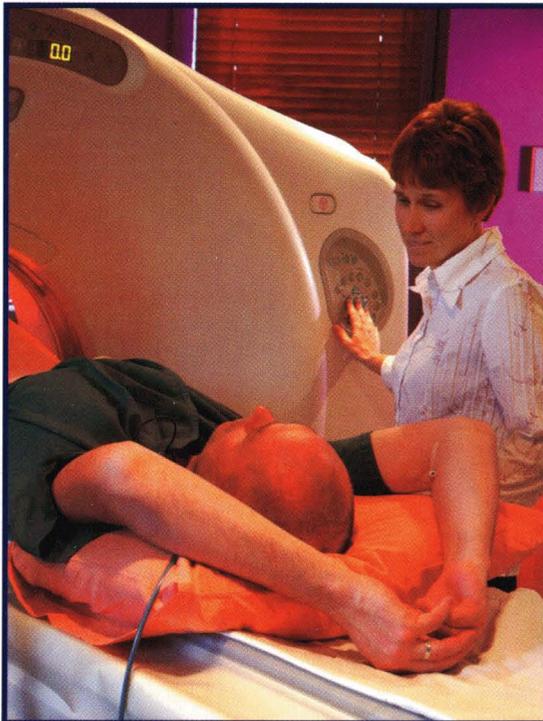
The new generation 64-slice CT scanner is a non-invasive method of assessing coronary artery disease and offers the following benefits to cardiac patients:

- ♥ Painless and non-invasive imaging of the coronary arteries
- ♥ High resolution 3 dimensional images of the coronary arteries
- ♥ Exceptional speed and accuracy – images obtained in a single breath hold
- ♥ Earlier diagnosis and assessment of coronary artery disease
- ♥ Highly specific for excluding coronary artery disease
- ♥ Reduces the need for invasive coronary angiography
- ♥ Improves patient education and understanding of their coronary disease
- ♥ Costs less than conventional invasive coronary angiography
- ♥ Results will be interpreted in the context of a comprehensive cardiac evaluation



How is a CT Angiography procedure performed?

- ♥ Medication is usually given to slow the heart rate.
- ♥ An intravenous cannula is inserted into the arm to enable contrast dye to be given.
- ♥ The patient lies on the table.
- ♥ The table slides the patient into the “doughnut” of the scanner as the X-ray tube circles the patient.
- ♥ The detector array records the X-rays from multiple angles and the images are then passed to a computer for reconstruction from 2 dimensional to 3 dimensional images.
- ♥ The patient is on the table for a very short time (approximately 10 minutes).



CT scanner in operation



A 3-dimensional (3D) reconstruction showing a view of the heart demonstrating the aorta, left anterior descending and circumflex coronary arteries



A 3D reconstruction showing left and right coronary arteries arising from the aorta.

How does CT angiography differ from conventional coronary angiography?

Conventional invasive coronary angiography remains the ‘gold standard’ for viewing the arteries that feed the heart. The following table compares CT coronary angiography and invasive coronary angiography and demonstrates the advantages of both.

	CT Coronary Angiography	Conventional Coronary Angiography
Invasive	No	Yes
Attendance time	1 – 2 hours	Minimum 5 – 7 hours
Diagnostic Use	Rules out significant coronary artery disease	Accurately shows severity of artery narrowings
Vessel Wall Narrowing	Shows vessel wall as well as the inside of the artery	Focuses on the inside of the artery
Intervention	Stenting treatment of narrowings not able to be done with this technology.	Stenting treatment of narrowings can be done
Contrast dye	Yes	Yes
X-ray used	Yes	Yes

What are coronary narrowings and why are they important?

Coronary arteries (Figure 1) can be narrowed by plaque (a mixture of cholesterol fat, fibrous tissue and calcium). If the artery is narrow, blood flow to the heart muscle may be reduced and this may cause angina (discomfort, often in the chest or arms, especially with exercise).

Sometimes a fatty plaque may “rupture” or “tear” exposing cholesterol to blood in the artery, causing the formation of a blood clot that may further narrow the artery and worsen angina. On occasion the blood clot may completely block the artery causing permanent damage to some parts of the heart muscle (heart attack or myocardial infarction).

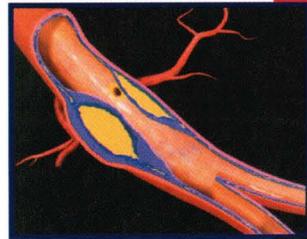


Figure 1

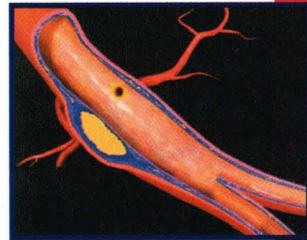


Figure 2

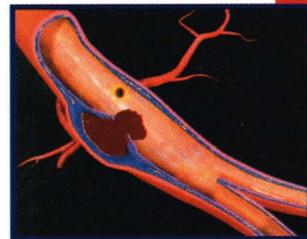


Figure 3

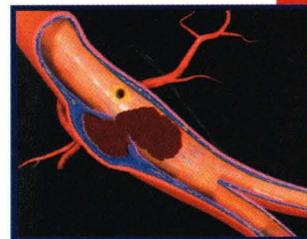


Figure 4

Figure 1 *Coronary artery narrowed by plaque.*

Figure 2 *Large lipid filled plaque in the wall of the coronary artery. Note the plaque bulges outwards and can be very large before it starts to narrow the inside of the artery.*

Figure 3 *A ruptured plaque with the formation of a blood clot (thrombosis) on top of the plaque and into the artery. This is partially narrowing the artery causing worsening or unstable angina.*

Figure 4 *A ruptured plaque with a blood clot (thrombosis) formed on top of the plaque and completely blocking the blood flow down the artery. This causes the heart muscle supplied by the artery to be damaged (heart attack or myocardial infarction) unless the artery can be quickly unblocked using blood clot dissolving drugs or urgent angioplasty and stenting.*

Preparation for CT Angiography

Before your CT scan

Please:

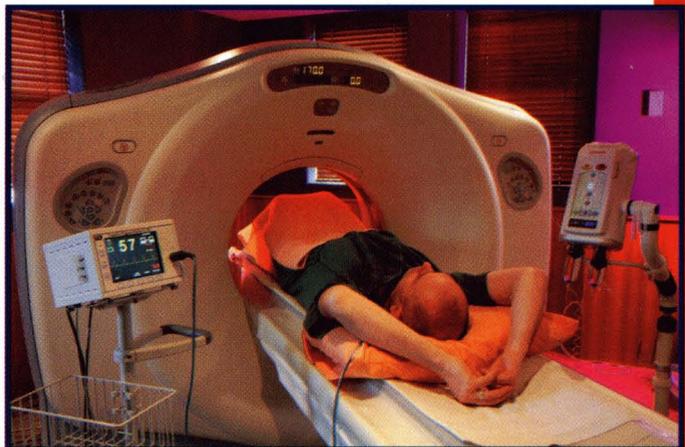
1. Do not eat for ²4 hours before your procedure, but you may drink clear fluids. *(If you are a diabetic, we can supply a small snack after your scan).*
2. Continue to take your regular medications as usual.
3. Do not have any alcohol or drinks containing caffeine (*coffee, tea, soft drinks*) on the day of the procedure.
4. You will be required to arrive at least an hour before your CT scan.
5. Bring your completed questionnaire with you.
6. Do not take Cialis, Viagra or Levitra for 36 hours before the procedure.

On arrival

1. A nurse will check your questionnaire noting your medical history. The nurse will record your pulse rate and blood pressure and an ECG may be performed.
2. You will be told about the procedure and its risks and given instructions.
3. You will be asked to sign a form consenting to the procedure.
4. You will usually be given medication orally to slow your heart rate.

During the CT scan

1. A small intravenous cannula will be inserted into a vein in your arm, before you go to the CT Room.
2. You will lie on the table.
3. Medication may be given into the vein to slow your heart rate.
4. You will usually be given nitroglycerin spray under the tongue to dilate your coronary arteries during the scan. This may on occasion cause a slight headache. Although it is not serious, please let the cardiologist or nurse know.
5. Contrast dye will be injected through a vein in your arm.
6. You will be instructed to hold your breath.
7. You will experience a brief warm flush, which spreads throughout your body. This is a normal reaction to the contrast dye.
8. You will be on the table for only a few minutes while it moves through the CT “doughnut” and the images are being taken by the X-ray machine.
9. A technologist and a cardiologist will be in attendance.



After the CT scan

1. The nurse will check your blood pressure and pulse and ensure you feel comfortable and well before you leave.
2. The computer generates 3D images from the 2D slices taken.
3. A technologist, cardiologist and radiologist will be involved in reviewing your images.
4. A full report of the CT Angiography will be made by a Cardiologist and sent to your referring Cardiologist or Specialist.
5. Analysis of the data is time consuming so a full report will not be immediately available.
6. Arrangements will be made for you to have a follow-up appointment with your cardiologist to receive your results and discuss on-going management of your cardiac condition taking into account your risk factors, symptoms and other test results. Your GP will be kept informed by receiving a copy of the report.

Frequently asked Questions

How do I get a Coronary CT angiogram?

Your GP can refer you to an Auckland Heart Group Cardiologist for assessment to see if you need a CT angiogram.

Are there any medical conditions which exclude me from having the test?

- Yes, if you are pregnant or possibly pregnant.
- If you have a very irregular heart beat you may be unsuitable for CT angiography.

What are the risks?

Allergic reactions to contrast dye can occur and are usually a mild temporary rash or itch. A serious allergy is rare, occurring in less than 1 in 10,000 people. You will be exposed to X-rays. The radiation dose is similar to conventional coronary angiography and about the same as the average person receives as background environmental radiation over a three year period. This procedure should not be done if you are pregnant or suspect you could be pregnant.

Can I have a CT angiogram if I already have a pacemaker or stents?

If you have a pacemaker or stent/s, please bring this to the attention of your Cardiologist and discuss this with him/her before your scan. Usually, it is possible to have a CT scan with stents and/or a pacemaker.

What is the cost?

The cost is \$1,600.00 (GST inclusive). We are an Affiliated Provider for Southern Cross Healthcare and have a specific cardiac CT benefit for this scan. We are able to provide a timely and efficient claims approval process on behalf of Southern Cross members. For other medical insurance companies, you will be required to obtain prior approval from your insurer before confirming your appointment.

How long does it take?

The actual scan takes approximately ten minutes. However, you are required to be present up to an hour beforehand to complete documentation and be medically prepared for the procedure. The total time involved could be between one and two hours.

What will I feel?

You will feel the small needle when it is placed in your arm vein. You will be instructed to hold your breath. You will experience a warm brief flush throughout your entire body when the dye is injected.

Can I drive home afterwards?

It is expected that you will be able to drive yourself home after your scan. The nurse will check you after your scan to ensure you are comfortable with this.

Do I need to see my doctor first?

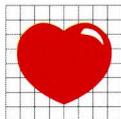
The usual referral pathway would be for you to visit your GP who would refer you to an Auckland Heart Group cardiologist. This cardiologist will discuss options with you and recommend whether CT coronary angiography is in your best interests. The recommendation will depend on your condition, cardiac risk factors and the results of other diagnostic tests, for example, your exercise treadmill test.

How will I know the results?

A follow up appointment with your cardiologist will be made at the time of your CT scan. At this time the results of your scan will be discussed with you together with your ongoing care plan. Your GP will be kept informed by receiving a copy of your result.

Whom do I contact to find out more?

Should you have further enquiries regarding CT Coronary Angiography,
Phone: 09 623 9838, visit www.heartgroup.co.nz
or email ahg@heartgroup.co.nz.



AUCKLAND
HEART
GROUP

94 Mountain Road, Epsom, Auckland 1023, New Zealand

Phone: 0-9-623 9838 Fax: 0-9-623 1030

Email: ahg@heartgroup.co.nz Web: www.heartgroup.co.nz