Central Sydney Cardiology
Australia's CaRi-Heart® Centre

Detecting Hidden Heart Risk with AI

Central Sydney Cardiology is proud to be the first designated CaRi-Heart® Centre in Australia, led by local CaRi-Heart® expert A/Prof Imre Hunyor. In partnership with Caristo Diagnostics (University of Oxford, UK), we now offer advanced analysis of coronary CT angiograms (CTCA) to detect hidden coronary inflammation, a powerful marker of future heart attack risk.

How it works

• CaRi-Heart® is performed on a standard cardiac CT scan (either a new scan or one you've had previously).

• The images are securely uploaded to Caristo's analysis platform, where artificial intelligence measures inflammation in the arteries and quantifies plaque.

• A detailed CaRi-Heart® Report is generated within 2–3 business days and returned to your cardiologist at CSC.

Why it matters

• Standard CT scans show if there are narrowings or blockages.

• CaRi-Heart® goes further, identifying "invisible" inflammation that increases your risk of future heart attacks — even when arteries appear clear.

• CaRi-Plaque® analysis can also be performed, providing detailed information about the amount and type of plaque in the coronary arteries — including calcified and non-calcified plaque — for a more complete picture of heart health.

• This information can help guide personalised prevention strategies, including lifestyle, cholesterol-lowering, and anti-inflammatory therapies.

• Serial analysis can also track disease activity and treatment response.

Referrals
Any cardiologist at Central Sydney Cardiology can refer you for CaRi-Heart® analysis based on a new CT coronary angiogram or a previous CT scan (if image quality is suitable).

After reviewing your CaRi-Heart® report, your cardiologist will discuss the findings with you and outline treatment options tailored to your results.

I What causes a Heart Attack?

II CaRi-Heart® Analysis

III Managing your heart health

An unpredictable condition

Coronary Artery Disease is a condition caused by the formation of plaques (fatty deposits) in the artery wall. This process is silent and takes place over years or decades. However, it is not predictable and may worsen abruptly.

A heart attack is caused by sudden rupture or erosion of the plaque, leading to blood clot formation that blocks the coronary artery.

If a plaque doesn't rupture abruptly, it may cause narrowing (stenosis) of the artery, which impairs blood supply to the heart muscle (ischaemia), causing chest pain.
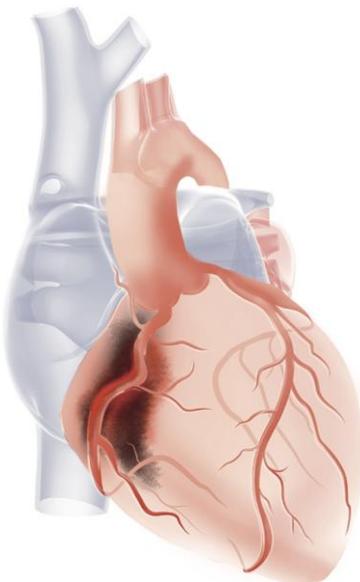
A HEART ATTACK IS OFTEN THE FIRST PRESENTATION OF CORONARY ARTERY DISEASE

Stenosis detected on Cardiac CT at time of heart attack*

6%
13%
22%
59%

- NO CAD
- <50% STENOSIS
- 50-70% STENOSIS
- 70%< STENOSIS
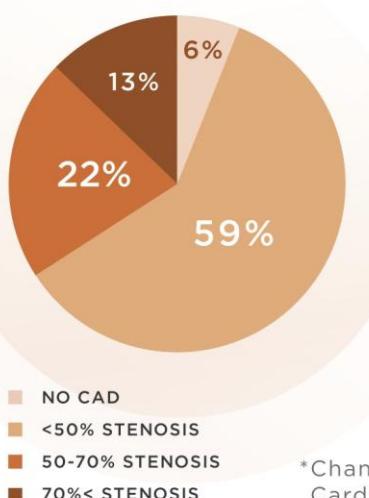
Current tests for coronary artery disease are focused on identifying a stenosis that causes ischaemia. However, more than half of the people who have a heart attack did not previously have a significant stenosis. Therefore, they often did not have any preceding symptoms (e.g. chest pain, breathlessness).

This means that many patients at high risk remain undiagnosed and untreated, until it is too late.

*Chang et al. Journal of the American College of Cardiology 2018, Volume 71, Issue 22

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Inflammation shows active Coronary Artery Disease

Coronary inflammation is not only responsible for the development and growth of plaque, but also for activating the biological mechanisms that make plaques more prone to rupture or erode, causing a heart attack.

Unfortunately, it may not produce any symptoms and can go undetected for many years.
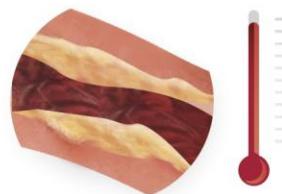
Inflammation is the 'catalyst' that makes coronary artery disease more active: knowing whether a person has evidence of coronary inflammation can help doctors prescribe treatments to prevent further development of coronary artery disease or stabilize dangerous plaques.

| Normal | > | Silent Inflammation | > | Structural Damage | > | Plaque Rupture | > | Heart Attack |

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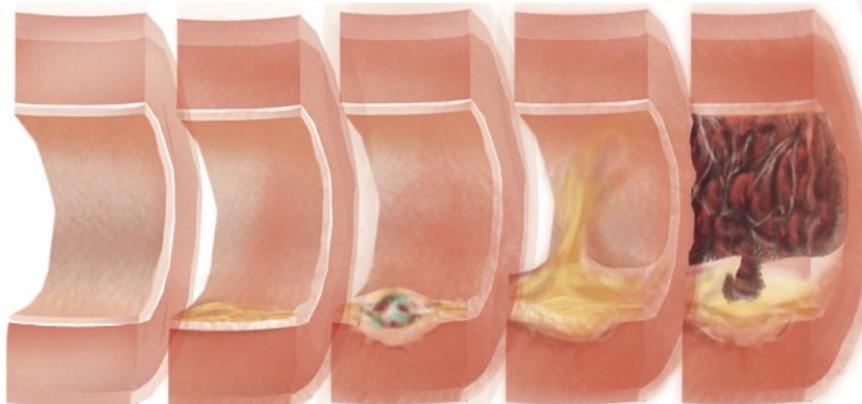
Can we measure inflammation if it is invisible?

Yes. Inflammation in your coronary arteries can be detected through advanced technologies that analyse changes, at a cellular level, which are invisible to the naked eye or any other cardiac test.

The CaRi-Heart® Analysis aids diagnosis with the quantification of inflammation by analysing images from a standard cardiac CT scan. It simply requires the images to be transferred to Caristo for analysis.

Your doctor will receive a report with information on your coronary artery disease activity.

Standard
CT Scan

CaRi-Heart® Analysis
(cloud-based platform)

CaRi-Heart®
Report

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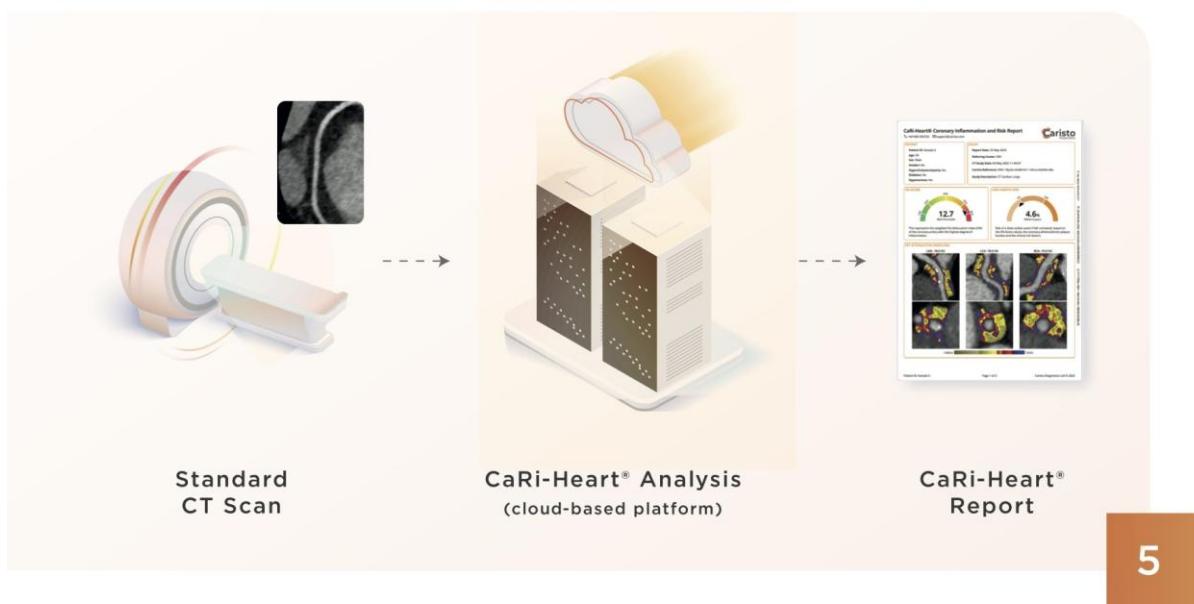
Coronary inflammation

The CaRi-Heart® Analysis provides an individualised quantification of coronary inflammation in each of the 3 main coronary arteries. This information includes

- Your relative risk indicated by the level of coronary artery inflammation, compared with people of the same age and gender

- A personalised estimate of your risk of having a fatal heart attack within the next 8 years

- A visual report that your doctor will interpret for you
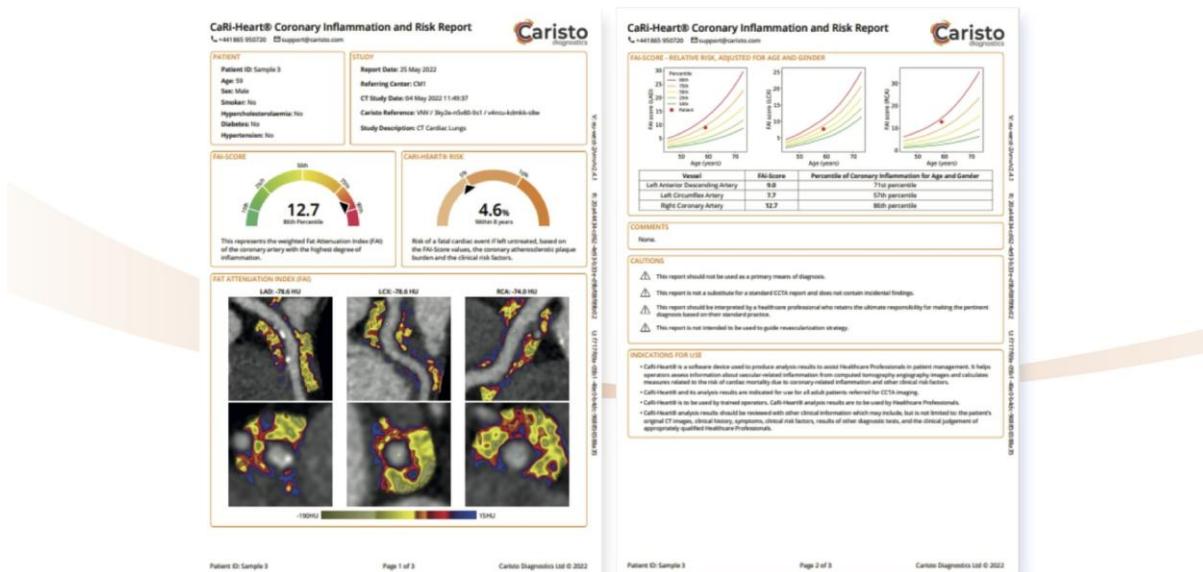

With CaRi-Heart® analysis you can

- Understand the root cause and severity of your condition

- Measure and monitor improvements in your treatment

- Feel confident that you receive appropriate care (tests, procedures, medication)

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Plaque assessment

The CaRi-Heart® analysis can also evaluate plaque volume and composition to help your doctor identify the characteristics most associated with heart attacks.

This combined information about anatomy and disease activity provides a comprehensive assessment of your cardiovascular risk.
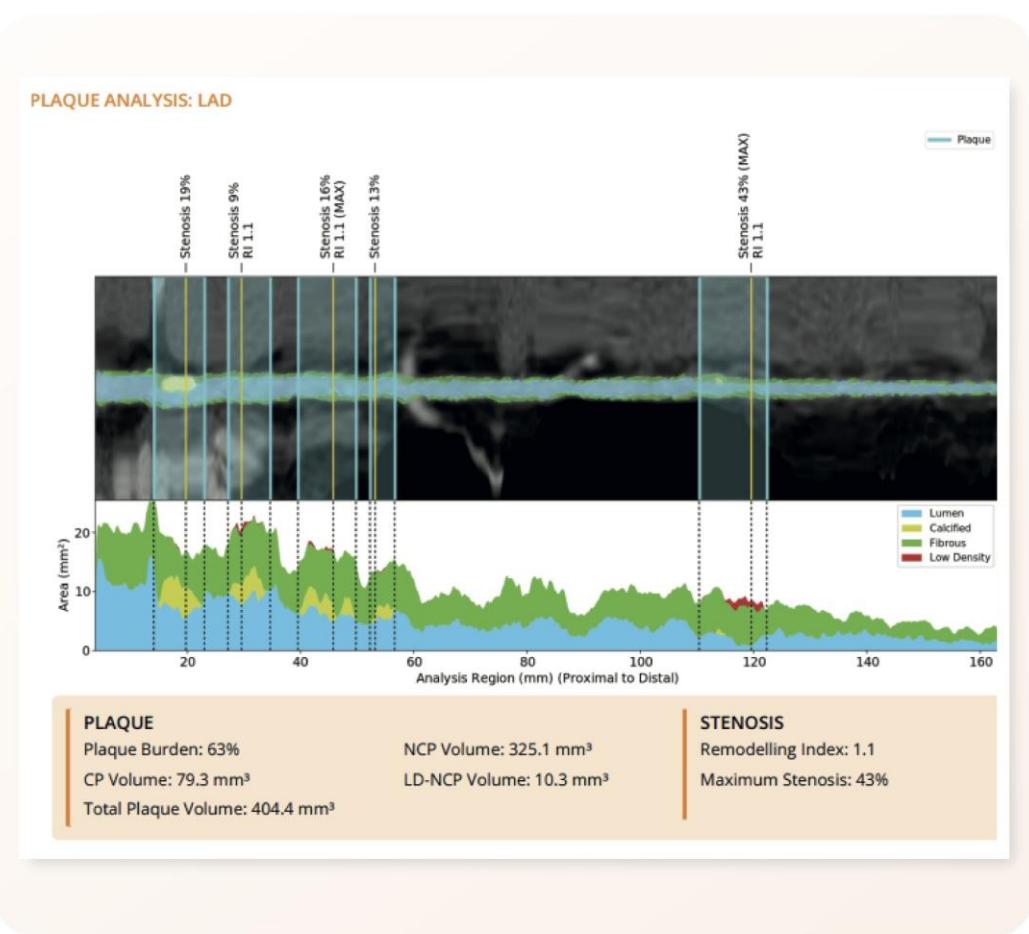
Plaque information provided on the CaRi-Heart® Analysis Report

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Inflammation is a risk factor for Cardiovascular Disease
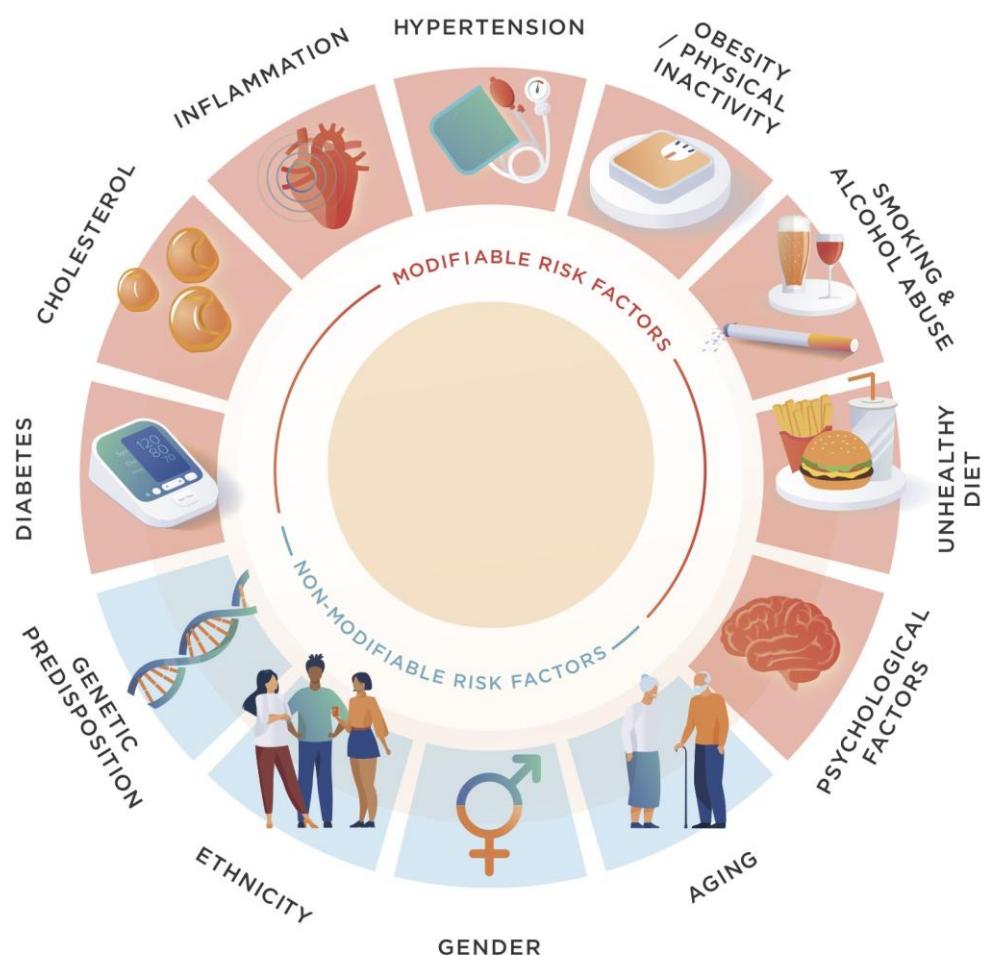
Several health conditions, your lifestyle, your age and family history can increase your risk for coronary artery disease (CAD). These are called risk factors.

Most of them, such as inflammation or cholesterol, are modifiable and can be managed to lower your overall cardiovascular risk.

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Reducing cardiovascular risk factors

In addition to lifestyle changes, various medicines are used to treat Coronary Artery Disease.

These include drugs to lower blood pressure, reduce heart rate, or prevent blood clotting. But lowering cholesterol is the primary focus of cardiac prevention through prescription of statins.

In addition to their beneficial effect on cholesterol, statins have anti-inflammatory properties.

Yet, many statin-treated patients continue to have life-threatening cardiac events. Beyond aggressive cholesterol lowering, these patients need to reduce this "residual risk", either through additional lifestyle improvements, by increasing their current treatments, or by considering drugs specifically aimed at reducing inflammation.

Avoiding a Heart Attack

Managing modifiable risk factors with a healthy lifestyle reduces the risk of developing plaque and lowers inflammation.

Lifestyle

Diet and Exercise

30 min per day,
5 times per week*

A prescribed nutrition plan to focus on your health objectives and symptoms.

Medication

Follow treatment recommended by doctor

The CaRi-Heart® Analysis will help your doctor prescribe the treatment most indicated for you to reduce risk factors including inflammation.

*Source: https://www.oxfordhealth.nhs.uk/health/lifestyle/exercise/