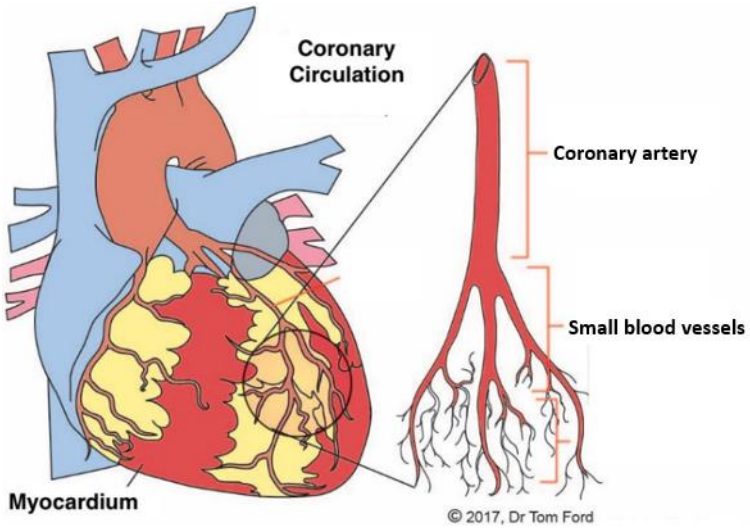
The Christ Hospital Health Network

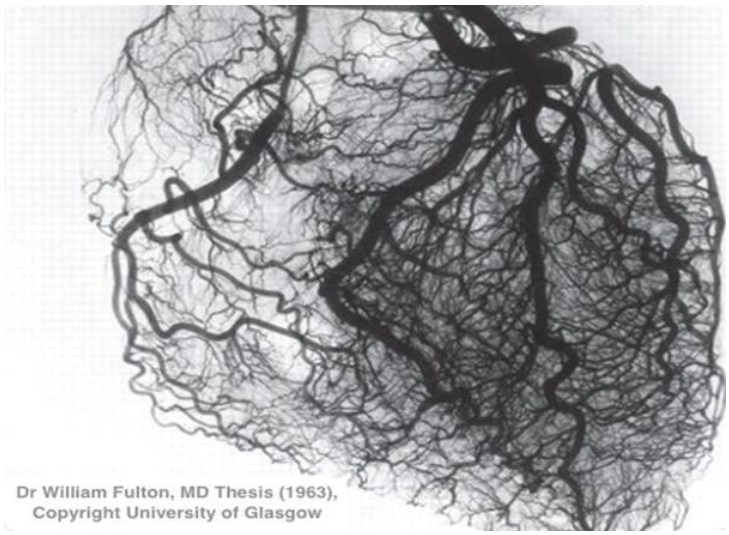
Ischemia with No Obstructive Coronary Artery Disease (INOCA)

INOCA refers to patients with signs and symptoms of blood supply problems (ischemia) to the heart muscle without significant blockage of the heart's large arteries. INOCA is considered a disease of the small blood vessels or small heart arteries.

An estimated 3-4 million people are thought to have undiagnosed INOCA in the US. INOCA is more common in women but also affects men. Cardiac testing, including a negative stress test or a coronary angiogram that did not show significant blockage, can miss INOCA, so patients with recurrent symptoms and a negative test must still be evaluated.

MICROVASCULAR ANGINA & CORONARY MICROVASCULAR DISEASE (CMD)

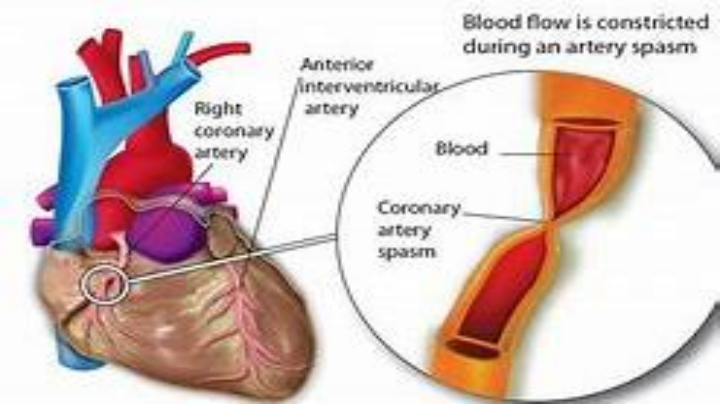




Many patients with INOCA have microvascular angina often caused by **coronary microvascular disease (CMD)**, which is disease of the small heart arteries. In patients with CMD, the small heart arteries are unable to properly dilate to allow increased blood flow when needed, such as during times of exercise, resulting in chest pain.

The Christ Hospital Health Network

VASOSPASTIC ANGINA or PRINZMETAL ANGINA



Many patients with INOCA have **vasospastic disease** which results from excessive coronary vasoconstriction affecting one or more segments of the large heart arteries. Patients with coronary spasm usually have angina at rest, mainly during the night or early morning hours, and may have a normal exercise tolerance with no chest pain on exertion.

SIGNS & SYMPTOMS

INOCA can cause symptoms of heart pain (angina) including:

- Chest pain
- Chest tightness
- Neck/shoulder/arm/back pain
- Shortness of breath
- Fatigue

Signs of ischemia can also include a positive blood test for heart damage (troponin) or a positive cardiac stress test. A negative stress test with persistent symptoms should raise suspicion for INOCA and often requires a second opinion at a specialized center.

DIAGNOSIS

A coronary reactivity test (CRT) or invasive functional angiography (IFA) is an angiography procedure performed in the catheterization lab to evaluate the coronary artery microcirculation and how the small blood vessels respond to different medications. Cardiologists use this information to distinguish different types of blood vessel reactivity and dysfunction. The results of this test enhance a cardiologist's ability to diagnose and treat patients with coronary microvascular disease or vasospastic disease and provide more specific treatment for symptoms.

TREATMENT

Treatment of INOCA and the underlying small artery disease remains a major unmet need, but strategies do now exist that can help improve patients' symptoms and quality of life.

The Women's Heart Center is currently accepting participants to further study INOCA through the Women's Ischemia Trial to Reduce Events in Non-Obstructive Coronary Artery Disease (WARRIOR) study.

FOR MORE INFORMATION

Further research is needed to have a clearer understanding of the cause and treatment of INOCA, ideally translating to improved care for patients. The Christ Hospital Women's Heart Center and Lindner Research Center are leading pioneering research to improve treatment of INOCA patients.

For more information, contact the Women's Heart Center:

513-585-2140

For more information regarding the WARRIOR study, please see list of current studies:

Womens Heart Center Research | The Christ Hospital

To schedule a second opinion, please visit:

https://www.thechristhospital.com/services/heart/second-opinion-program/second-opinion-form

To learn more, please visit:

TheChristHospital.com/womens-heart
http://www.INOCAInternational.com