

Coronary Artery Chronic Total Occlusion (CTO)

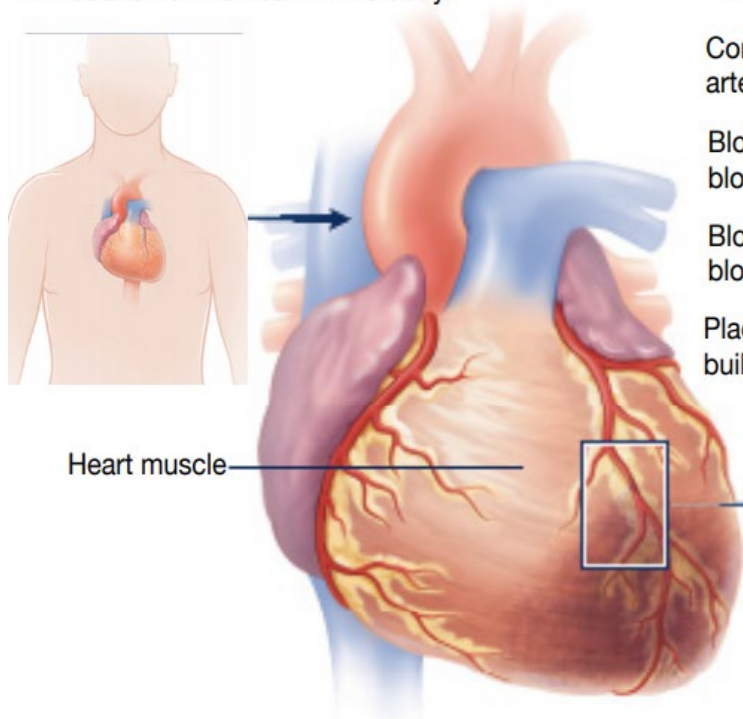
What is coronary artery disease?

Coronary arteries are small vessels on the outside of the heart. **Coronary (heart) artery disease** occurs when the coronary arteries become narrowed or blocked as a result of atherosclerosis. **Atherosclerosis** is the buildup of fatty deposits or plaque on the inner walls of the arteries that restricts blood flow to the heart muscle.

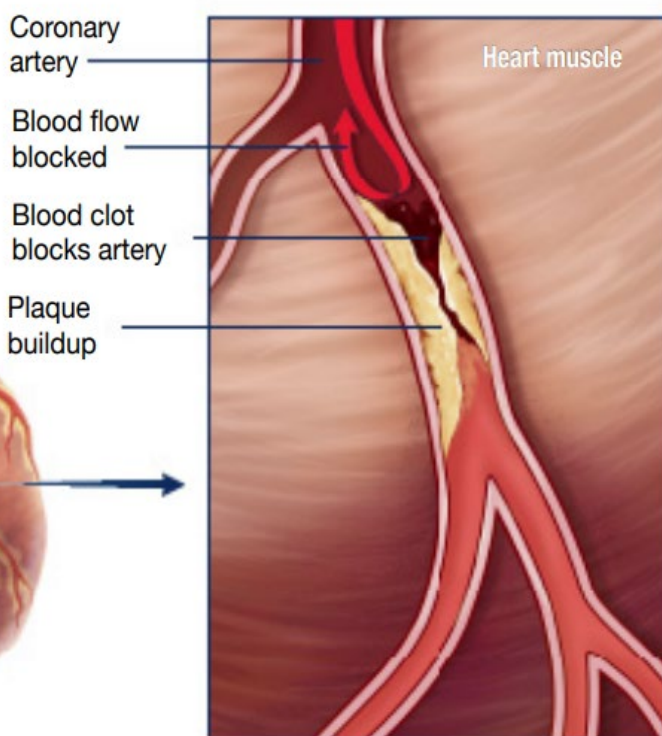
When a coronary artery is completely blocked, a heart attack may occur that can damage the heart muscle. If the blockage occurs more slowly, the heart may create small blood vessels called “collaterals” that supply an alternative route of blood to the heart muscle. This may cause chest pain (angina).

Heart Damage from a Blocked Coronary Artery

A. Location of the heart in the body.



B. Shows a section of the coronary artery with plaque buildup and a blood clot.



Adapted from <http://www.nhlbi.nih.gov/health>

What is coronary artery chronic total occlusion (CTO)?

A complete blockage in your coronary artery is called a **total coronary occlusion**, and if it has been present for more than 90 days, a **chronic total occlusion (CTO)**. These blockages are a result of the buildup of plaque within the coronary arteries and are one of the complications from coronary artery disease.

What are the symptoms of CTO?

When there is not enough blood flow to the heart muscle, you may experience many symptoms. These symptoms typically occur when you are up and moving but sometimes occur at rest. If you have CTO, you may experience these symptoms:

- Chest discomfort (angina)
- Shortness of breath
- Activity intolerance

What are the risk factors for CTO?

- Smoking
- High cholesterol
- Diabetes
- High blood pressure
- History of heart attack or known coronary artery disease
- Obesity

How is a CTO diagnosed?

Your doctor will diagnose a chronic total occlusion based on your medical history, a physical exam and a **coronary angiogram** procedure. During this procedure, contrast material is injected into your coronary arteries and pictures are taken of them. It shows if you have any blockages in your coronary arteries and how well your heart muscle and valves are working. The following tests may also be ordered to fully understand your condition:

- EKG
- Echocardiogram
- Stress test
- Nuclear medicine PET scan
- Cardiac MRI

How is CTO treated?

For many people the treatment for CTO is mainly reducing the risk for future cardiac (heart-related) events, in addition to improving symptoms. In the past, treatment options for people suffering from symptoms of CTO were limited to either medication alone or **coronary artery bypass graft (CABG)** - an open heart surgery to reroute the blood flow.

Now, with specialized equipment and advanced techniques, interventional heart doctors can treat CTOs with a **minimally invasive procedure** (no or small incisions) called **percutaneous coronary intervention (PCI)**. This involves a stent to open up blood vessels and is good for those who have symptoms despite the best medical treatment.

How do I learn more about coronary artery disease?

The following website resources:

- University of Michigan-Frankel Cardiovascular Center
<https://www.umcvc.org/conditions-treatments/coronary-artery-disease-cad>
- American Heart Association
<https://www.heart.org>
- National Heart, Lung, and blood Institute
<https://www.nhlbi.nih.gov>

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