



## Coronary Anomalies

Coronary artery anomalies (CAAs; also known as anomalous coronary arteries) are any defect in one or more of the coronary arteries that supply oxygen to the heart muscle. The defects may relate to an artery's origin, location, size, and/or shape and often are found in patients with congenital heart diseases (those present at birth).

### Are CAAs dangerous?

The coronary arteries supply the heart with oxygen-rich blood. Thus, any defect in a coronary artery can lead to myocardial ischemia (a lack of blood to the heart muscle) and sudden cardiac death.

This condition has recently received a lot of attention, as many young athletes have died suddenly after strenuous exertion because they unknowingly had a CAA called hypertrophic cardiomyopathy. In fact, 15% to 34% of young athletes who experience sudden cardiac death are found to have a CAA, which is the second leading cause of death for this population. Strenuous physical activities may also lead to sudden cardiac death in adults who have a CAA.

### What causes CAAs?

The exact causes are unknown, as the development of the coronary arteries is a highly complicated process. Any mishap during development can lead to a CAA.

Sometimes CAAs run in families. They are detected in about 5% of people who undergo cardiac catheterization.

### How would I know if I have a CAA?

Unfortunately, most people with a CAA do not even know they have the condition, either because they do not have any symptoms at all or because sudden cardiac death (sudden cardiac arrest) occurs unexpectedly. It is possible that sudden cardiac death is caused by the abnormal coronary artery becoming “sandwiched” between larger arteries that have expanded during exercise, which reduces the blood flow to the heart and causes immediate death.



In babies and youth, some of the symptoms of a CAA may include:

- Breathing problems
- Pale skin
- Poor feeding
- Sweating

In teens and adults, the symptoms of a CAA may include:

- Fainting during strenuous exercise (often the first and most dramatic symptom of a CAA)
- Shortness of breath at rest or during exercise
- Fatigue
- Chest pain at rest or during exercise

### How is a CAA detected?

Your doctor will perform an exam and may require additional tests, such as:

- Echocardiography to show heart size and any muscle damage
- Transesophageal echocardiography to view the heart from within the esophagus
- Angiography, a cardiac catheterization procedure that offers an up-close look at the coronary arteries and any defects
- Magnetic resonance imaging (MRI) to see detailed heart images that may reveal a CAA
- Magnetic resonance angiography, which depicts blood flow through the arteries
- Computed tomography (CT or “CAT”) scanning, especially electron beam computed tomography, which creates a detailed image of the coronary arteries
- Nuclear imaging tests to study the blood flow to the heart and assess any damage to the heart muscle



### How are CAAs treated?

- Lifestyle changes – including becoming less active and avoiding strenuous exercise or aggressive sports
- Medicines – beta-blockers slow the heartbeat, diuretics (water pills) reduce fluid and take pressure off the heart's pumping capacity, antiarrhythmic medicines control the heartbeat and oxygen therapy forces more oxygen-rich blood to the heart
- Percutaneous coronary interventions – a long, thin tube (catheter) is threaded through an artery or vein in the leg or arm and into the heart so that a stent can be placed in the artery to open it
- Surgery – may be needed, depending on the type of CAA