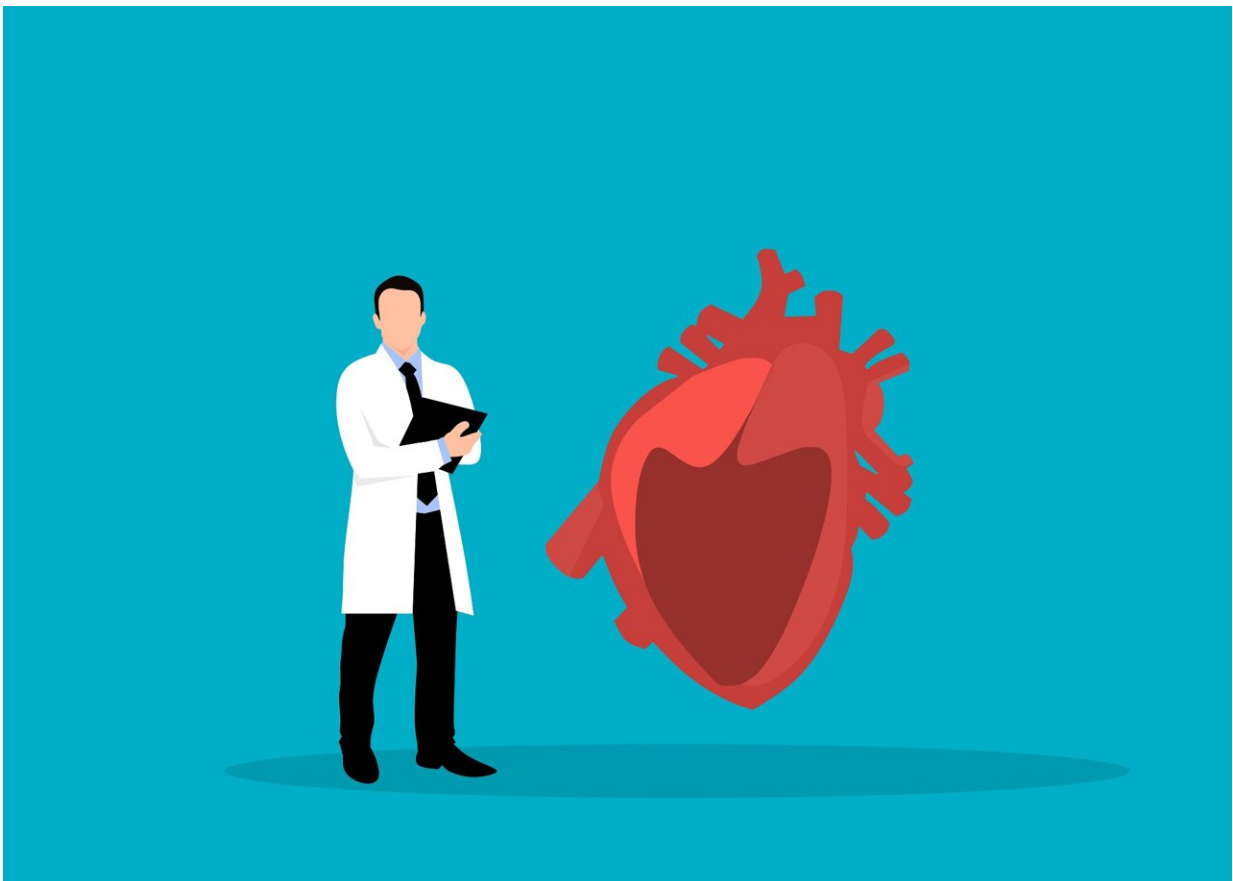


What's the difference between a heart attack and cardiac arrest? One's about plumbing, the other wiring

September 9 2024, by Michael Todorovic and Matthew Barton



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In July 2023, rising US basketball star Bronny James collapsed on the

court during practice and was sent to hospital. The 18-year-old athlete, son of famous LA Lakers' veteran LeBron James, had experienced a [cardiac arrest](#).

Many media outlets incorrectly referred to the event as a "[heart attack](#)" or used the terms interchangeably.

A cardiac arrest and a [heart attack](#) are distinct yet overlapping concepts associated with the heart.

With some background in [how the heart works](#), we can see how they differ and how they're related.

Understanding the heart

The heart is a muscle that contracts to work as a pump. When it contracts it pushes blood—containing oxygen and nutrients—to all the tissues of our body.

For the heart muscle to work effectively as a pump, it needs to be fed its own blood supply, delivered by the coronary arteries. If these arteries are blocked, the heart muscle doesn't get the blood it needs.

This can cause the heart muscle to become injured or die, and results in the heart not pumping properly.

Heart attack or cardiac arrest?

Simply put, a heart attack, technically known as a myocardial infarction, describes injury to, or death of, the heart muscle.

A cardiac arrest, sometimes called a [sudden cardiac arrest](#), is when the

heart stops beating, or put another way, stops working as an effective pump.

In other words, both relate to the heart not working as it should, but for different reasons. As we'll see later, one can lead to the other.

Why do they happen? Who's at risk?

Heart attacks typically result from blockages in the coronary arteries. Sometimes this is called [coronary artery disease](#), but in Australia, we tend to refer to it as ischemic heart disease.

The underlying cause in about [75% of people](#) is a process called [atherosclerosis](#). This is where fatty and fibrous tissue build up in the walls of the coronary arteries, forming a plaque. The plaque can block the blood vessel or, in some instances, lead to the formation of a blood clot.

Atherosclerosis is a long-term, stealthy process, with a number of risk factors that can sneak up on anyone. High blood pressure, high cholesterol, diet, diabetes, stress, and your genes have all been implicated in this plaque-building process.

Other causes of heart attacks include spasms of the coronary arteries (causing them to constrict), chest trauma, or anything else that reduces blood flow to the heart muscle.

Regardless of the cause, blocking or reducing the flow of blood through these pipes can result in the heart muscle not receiving enough oxygen and nutrients. So cells in the heart muscle can be injured or die.

But a cardiac arrest is the result of heartbeat irregularities, making it harder for the heart to pump blood effectively around the body. These

heartbeat irregularities are generally due to [electrical malfunctions](#) in the heart. There are four distinct types:

- **ventricular tachycardia:** a rapid and abnormal heart rhythm in which the heartbeat is more than [100 beats per minute](#) (normal adult, resting heart rate is generally 60–90 beats per minute). This fast heart rate prevents the heart from filling with blood and thus pumping adequately
- **ventricular fibrillation:** instead of regular beats, the heart quivers or "fibrillates," resembling a bag of worms, resulting in an irregular heartbeat greater than 300 beats per minute
- **pulseless electrical activity:** arises when the heart muscle fails to generate sufficient pumping force after electrical stimulation, resulting in no pulse
- **asystole:** the classic flat-line heart rhythm you see in movies, indicating no electrical activity in the heart.

Cardiac arrest can arise from numerous underlying conditions, both heart-related and not, such as drowning, trauma, asphyxia, electrical shock and drug overdose. James' cardiac arrest was attributed to a [congenital heart defect](#), a heart condition he was born with.

But among the many causes of a cardiac arrest, ischemic heart disease, such as a heart attack, stands out as the most common cause, accounting [for 70%](#) of all cases.

So how can a heart attack cause a cardiac arrest? You'll remember that during a heart attack, heart muscle can be damaged or parts of it may die. This damaged or dead tissue can disrupt the heart's ability to

conduct electrical signals, increasing the risk of developing arrhythmias, possibly causing a cardiac arrest.

So while a heart attack is a common cause of cardiac arrest, a cardiac arrest generally does not cause a heart attack.

What do they look like?

Because a cardiac arrest results in the sudden loss of effective heart pumping, the most common signs and symptoms are a sudden loss of consciousness, absence of pulse or heartbeat, stopping of breathing, and pale or blue-tinged skin.

But the common signs and symptoms of a heart attack include [chest pain](#) or discomfort, which can show up in other regions of the body such as the arms, back, neck, jaw, or stomach. Also frequent are shortness of breath, nausea, light-headedness, looking pale, and sweating.

What's the take-home message?

While both heart attack and cardiac arrest are disorders related to the heart, they differ in their mechanisms and outcomes.

A heart attack is like a blockage in the plumbing supplying water to a house. But a [cardiac arrest](#) is like an electrical malfunction in the house's wiring.

Despite their different nature both conditions can have severe consequences and require immediate medical attention.

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