

# If You Don't Know CPR, You Will After Watching This

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## STORY AT-A-GLANCE

- › By increasing blood flow to the organs, CPR provides a life-saving, temporary treatment for cardiac arrest
- › If someone near you experiences cardiac arrest, you should first call 911, then immediately begin CPR
- › For the general public, hands-only CPR, or compression-only CPR, is recommended and highly effective
- › Perform chest compressions at a rate of 100 to 120 per minute; this is about the same beat as the song “Stayin’ Alive”
- › If you have access to an automated external defibrillator (AED), which are required in many public spaces, follow its simple instructions to deliver a shock to the heart

Would you know what to do if a loved one – or even a stranger – went into cardiac arrest? Knowing what to do in this emergency situation, and administering cardiopulmonary resuscitation (CPR), could save a life. CPR, which involves making chest compressions on the person affected, helps increase blood flow to the organs<sup>1</sup> until more advanced treatment is available.

In the video above, CNN's Dr. Tara Narula demonstrates how to perform hands-only CPR if you witness someone go into cardiac arrest. If more people learn this simple technique, it could have major implications for public health as, currently, about 350,000 Americans die annually from cardiac arrest. That's more than the number of deaths from

colorectal cancer, breast cancer, prostate cancer, influenza, pneumonia, auto accidents, HIV, firearms and house fires combined.<sup>2</sup>

## What Is Cardiac Arrest?

Cardiac arrest occurs suddenly due to a malfunction in the heart that causes it to stop beating. Some cases of cardiac arrest have no symptoms. In other instances, the following symptoms may occur prior to the event:<sup>3</sup>

Fatigue	Dizziness
Shortness of breath	Nausea
Chest pain	Heart palpitations (fast or pounding heart beat)
Loss of consciousness	

While blood loss, lack of oxygen and high levels of potassium and magnesium – which can cause arrhythmia, or irregular heartbeat – can lead to cardiac arrest, there are three primary causes:<sup>4</sup>

1. **Arrhythmia** – An electrical signal in the heart may lead to an irregular heartbeat known as ventricular fibrillation, which is the No. 1 cause of cardiac arrest. It describes a heartbeat so rapid that the heart trembles instead of pumping blood.
2. **Cardiomyopathy (enlarged heart)** – This leads to abnormal heart contractions.
3. **Coronary artery disease** – If coronary arteries become blocked by plaque, it restricts blood flow to the heart. Left untreated, this may lead to heart failure or arrhythmia, which can trigger cardiac arrest.

While cardiac arrest often occurs without warning or a known underlying cause, there are certain risk factors known to increase the risk, which include:<sup>5</sup>

Alcohol or drug abuse	Family history of heart disease or cardiac arrest
Heart disease	High blood pressure
Low potassium or magnesium	Obesity
Smoking	

## **Difference Between a Heart Attack and Cardiac Arrest**

Unlike a heart attack, which occurs due to blocked blood flow to the heart – and during which the heart usually continues beating – during a cardiac arrest the person loses consciousness and does not have a pulse.<sup>6</sup> As noted by the American Heart Association, “A heart attack is a ‘circulation’ problem and sudden cardiac arrest is an ‘electrical’ problem.”<sup>7</sup>

The most immediate and recognizable difference is that a heart attack victim will remain conscious with their heart beating, while someone who suffers a sudden cardiac arrest will be unconscious with no discernible heartbeat.

While a heart attack affects the oxygen supply to the heart muscle, cardiac arrest affects the electrical impulses. During a heart attack, part of the heart may have a reduction in oxygen supply if the blood is restricted, but the remaining areas of the muscle will continue to beat.

During a cardiac arrest, the electrical system is impacted by physical conditions, such as cardiomyopathy, heart failure or arrhythmias. A heart attack will also increase your risk of having a sudden cardiac arrest, however, since the loss of oxygen supply will affect the electrical system in the heart. This is perhaps the most common reason for a sudden cardiac arrest.<sup>8</sup>

In other words, loss of oxygen to the heart muscle from a heart attack affects the electrical impulses and may trigger a cardiac arrest.

## **How to Perform CPR for Cardiac Arrest**

By increasing blood flow to the organs, CPR provides a life-saving, temporary treatment for cardiac arrest. If someone near you experiences cardiac arrest, you should first call 911, then immediately begin CPR. If you're a health care provider or well-trained in CPR, the American Heart Association (AHA) recommends using conventional CPR using chest compressions and mouth-to-mouth breathing, at a ratio of 30-to-2 – 30 chest compressions, followed by two breaths, then repeat.

However, for the general public, hands-only CPR, or compression-only CPR, is recommended and highly effective. How does hands-only CPR work, even without mouth-to-mouth breathing? According to AHA:<sup>9</sup>

*“When a teen or adult suddenly collapses with cardiac arrest, his or her lungs and blood contain enough oxygen to keep vital organs healthy for the first few minutes, as long as someone provides high quality chest compressions with minimal interruption to pump blood to the heart and brain.”*

The basics? “Push hard and fast in the center of the chest.”<sup>10</sup> Acting fast is crucial, as each minute that CPR is delayed, the person's chance of survival goes down by 10%.<sup>11</sup> So doing something, even if it isn't perfect, is usually better than doing nothing. As noted by AHA:<sup>12</sup>

*“Adults who suddenly collapse and are not responsive are likely experiencing sudden cardiac arrest. Their chance of survival is nearly zero unless someone takes action immediately ... In the majority of cases, any attempt to provide CPR to a victim is better than no attempt to provide help.”*

Fortunately, hands-only CPR is straightforward and involves the following steps:

- Perform chest compressions at a rate of 100 to 120 per minute. This is about the same beat as the song “Stayin’ Alive,” which is 100 beats per minute<sup>13</sup>
- The compressions must be done with enough force, to a depth of about 2 inches for an average adult<sup>14</sup>

While remembering the basics is what’s most important in a time of crisis, there are additional components that ensure the CPR administered is most effective. This includes:<sup>15</sup>

- Don’t stop; minimize interruptions in chest compressions
- Provide compressions at an adequate rate and an adequate depth
- Avoid leaning on the patient between compressions
- Ensure proper hand placement
- Avoid excessive ventilation

## **CPR Doubles or Triples Survival From Cardiac Arrest**

It’s important for the public to understand how effective CPR is – and the impact it has on the life of someone suffering from cardiac arrest. Sadly, about 90% of people who experience cardiac arrest outside of a hospital setting die. However, if CPR is administered immediately, the person’s chance of survival can double or triple.<sup>16</sup>

Even though CPR can make the difference between life and death, only about 46% of people who go into cardiac arrest outside of a hospital get immediate help before professionals arrive.<sup>17</sup> About 70% of Americans indicated they feel helpless to act during a cardiac arrest because they’re not sure how to perform CPR and don’t want to hurt the person.<sup>18</sup>

There are differences between men and women as well, with men being 1.23 times more likely to receive CPR from a bystander in public compared to women. Perhaps as a result, men’s chance of survival is 23% higher than women’s.<sup>19</sup> The difference, AHA

notes, “could come down to anatomy and a bystander being comfortable enough to perform CPR on a woman.”<sup>20</sup>

Increased awareness of the simple steps involved in hands-only CPR can help alleviate the misconception that you must be a health care provider to effectively perform CPR.

AHA explains:<sup>21</sup>

*“Anyone can learn Hands-Only CPR and save a life. Hands-Only CPR has just two easy steps: If you see a teen or adult suddenly collapse, (1) Call 9-1-1; and (2) Push hard and fast in the center of the chest to the beat of the disco song Stayin’ Alive.”*

## **AEDs Are Also Lifesaving**

If you have access to an automated external defibrillator (AED), it should be used immediately to assist a person in cardiac arrest. AEDs are required in certain public spaces in many U.S. states, including schools, athletic facilities, casinos and public golf courses.<sup>22</sup> When emergency medical personnel arrive to help a person in cardiac arrest, they will use a defibrillator immediately.

The device sends an electric shock, or defibrillation, to the heart, helping it to start beating normally again. If you’re in a public space with an AED available and someone is experiencing cardiac arrest, follow the AED’s included instructions to help. Once the unit is turned on, it will provide voice prompts instructing you on what to do.

It involves placing two sticky pads (electrodes) on the person’s bare chest. One pad goes on the upper right side of the chest, while the other goes on the lower left side of the chest, below the armpit.<sup>23</sup> The AED will analyze the person’s heart rhythm to determine if an electric shock is needed. If defibrillation shock is necessary, the device will instruct the user to deliver a shock.<sup>24</sup> You should stand clear of the patient while this occurs.

After the shock is delivered, begin CPR immediately, continuing for two minutes before checking to see if another shock is needed.

# The Six-Step Chain of Survival

AHA promotes a six-step chain of survival that should be followed to help adults in cardiac arrest. “A strong Chain of Survival can improve chances of survival and recovery for victims of cardiac arrest,” it explains. The steps include:<sup>25</sup>

1. Recognition of cardiac arrest and activation of the emergency response system (in the U.S., calling 911)
2. Early CPR with an emphasis on chest compressions
3. Rapid defibrillation
4. Advanced resuscitation by emergency medical services or other health care providers
5. Post-cardiac arrest care
6. Recovery, including additional treatment, observation, rehabilitation and psychological support

As far as prevention, lifestyle changes are key to building a healthy heart. This includes eating right, avoiding excess **linoleic acid** from seed oils, exercising, dealing with stress and getting proper sleep. For instance, women with low fitness levels have a higher risk of dying from any cause, including cardiac arrest.<sup>26</sup> While cardiac arrest often occurs unexpectedly, leading an ongoing **heart-healthy lifestyle** is the best approach to prevention.

## Sources and References

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- <sup>1, 3, 4, 5</sup> [Johns Hopkins Medicine, Health, Cardiac Arrest](#)
- <sup>2, 16, 17</sup> [American Heart Association, CPR Facts & Stats](#)
- <sup>6, 7</sup> [American Heart Association, Heart Attack and Sudden Cardiac Arrest Differences](#)
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- <sup>9, 10, 11, 12, 18, 21</sup> [American Heart Association, Hands-Only CPR](#)
- <sup>13</sup> [American Heart Association, FAQ: Hands-Only CPR](#)
- <sup>14, 15, 19, 20, 25</sup> [American Heart Association, What Is CPR?](#)
- <sup>22</sup> [U.S. CDC, Public Access Defibrillation \(PAD\) State Law Fact Sheet](#)
- <sup>23</sup> [American Red Cross, AED Steps](#)

- <sup>24</sup> U.S. FDA, How AEDs in Public Places Can Restart Hearts
- <sup>26</sup> Ball State University February 5, 2019