Acting quickly after heart attack symptoms start can be a heart saver

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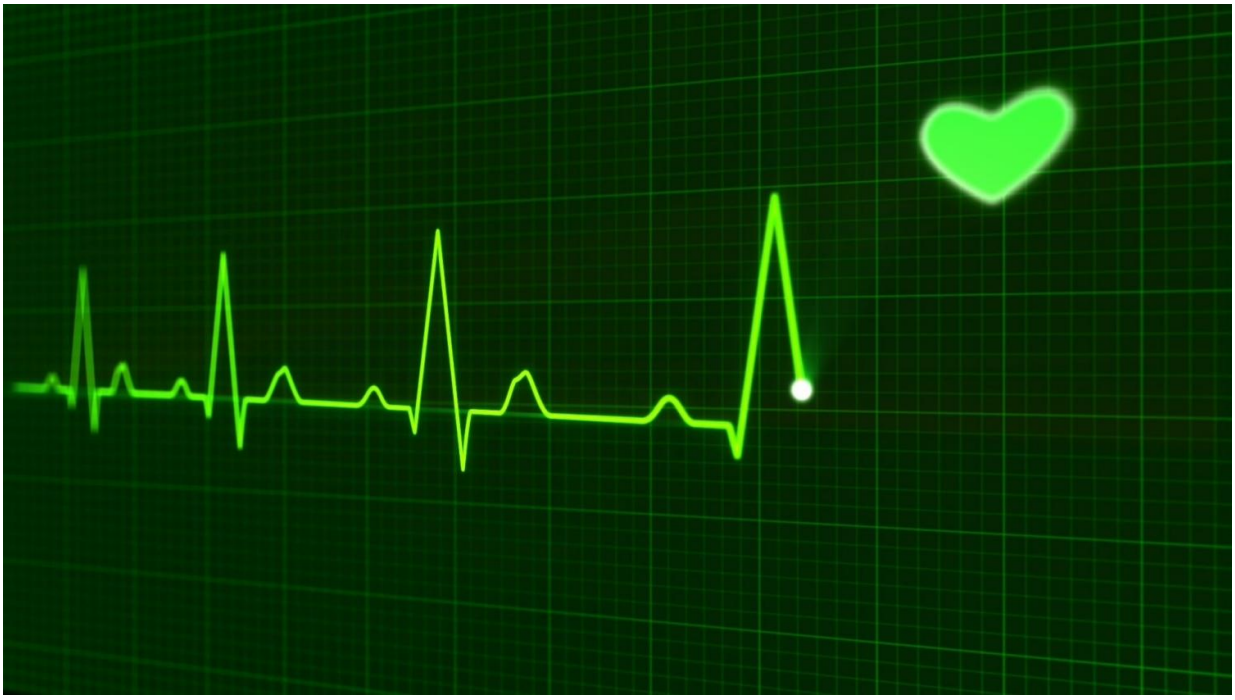

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The longer the time between when heart attack symptoms start and a patient has an artery-clearing percutaneous coronary intervention (PCI), the more damage to the heart muscle, according to new research published today in *Circulation: Cardiovascular Interventions*.

A heart attack happens about every 40 seconds in the U.S., and the most

common heart attack is caused by a complete blockage in a coronary artery, called ST-elevation myocardial infarction (STEMI). STEMI patients are most often treated with PCI, also known as angioplasty with stent, in which a catheter with a deflated balloon is inserted into the narrowed heart artery. Subsequently, the balloon is inflated, which clears the obstruction and restores blood flow. A stent is then inserted to keep the artery open.

"We know the time to opening the blocked coronary artery with PCI in heart attack patients is an important indicator for how a patient does after their heart attack. There are two measures for this time. One is symptom-to-balloon time, which is before the patient arrives to the hospital after symptoms start, to when that patient has a PCI; second is door-to-balloon time, the time from hospital arrival to PCI," said study author Gregg W. Stone, M.D., director of academic affairs at Mount Sinai Heart Health System in New York City. "We focused on heart attack size, or damage, with both time measures and found symptom-to-balloon time was by far the more important."

Stone and colleagues analyzed the data from 10 randomized controlled trials that followed more than 3,100 STEMI patients enrolled after PCI between 2002-2011. Patients' hearts were assessed within between 3-12 days after PCI to measure the size of the heart attack, and some studies also included measures of ejection fraction (a measure of the percentage of blood the heart is able to pump with each contraction) and TIMI flow (a measure of blood flow in the coronary artery). All patients had clinical follow-up data for at least six months, with a median follow-up of 341 days after PCI.

The study found:

- Symptom-to-balloon time was more strongly associated with heart attack size and patients' clinical health after heart attack

than door-to-balloon time.

- The median symptom-to-balloon time was 185 minutes. The median door-to-balloon time was 46 minutes.
- Symptom-to-balloon time represented approximately 80% of the total time from symptom onset to treatment of the artery.
- The size of the heart attack increased with longer symptom-to-balloon times, whereas longer door-to-balloon times were not notably related to heart attack size.
- Older age, female sex, arterial hypertension, diabetes and left circumflex artery as the culprit vessel were associated with longer symptom-to-balloon time.
- For every 60-minute delay in symptom-to-balloon time, the one-year rate of death or hospitalization for heart failure was increased by 11%. In contrast, there was no relationship between delays in door-to-balloon time and these clinical results.

"Health care teams have worked to reduce door-to-balloon times and are achieving excellent results with a median time of 46 minutes. While we shouldn't become complacent and relax our current standards of rapidly performing PCI as soon as possible after the patient reaches the hospital, this study suggests that major efforts to further shorten door-to-balloon times by 10 or 20 minutes might not translate to better PCI outcomes," Stone said. "Our analysis indicates the more important and meaningful focus should be to shorten the delays from symptom onset to arrival at hospitals that can perform PCI. We must emphasize efforts to increase public awareness of heart attack symptoms and shorten the time it takes for patients to access emergency care."

These findings are extremely important and particularly relevant right now, said American Heart Association president Mitchell S.V. Elkind, M.D., M.S., FAHA, FAAN, professor of neurology and epidemiology at Vagelos College of Physicians and Surgeons and attending neurologist at New York-Presbyterian/Columbia University Irving Medical Center.

"During the peaks of the COVID-19 pandemic, hospitals are reporting fewer people coming into the emergency room for heart attack and stroke symptoms—indicating people aren't calling 911, or they are delaying or avoiding critical care," Elkind said. "This concerns us because we know it's very unlikely that there are fewer heart attacks or strokes occurring. These new findings emphasize just how crucial it is to call 911 at the first sign of a heart attack or stroke—because getting quick treatment can be the difference between life and death. As we have been urging even during the COVID-19 pandemic, don't die of doubt. Call 911 as soon as possible."

Among the limitations of this analysis, detailed information about the intensity of chest pain or other heart attack signs and symptoms, or about the time from symptom onset to PCI was not available from the clinical trials' data..

More information: *Circulation: Cardiovascular Interventions*, www.ahajournals.org/doi/10.116 … RVENTIONS.120.009879

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