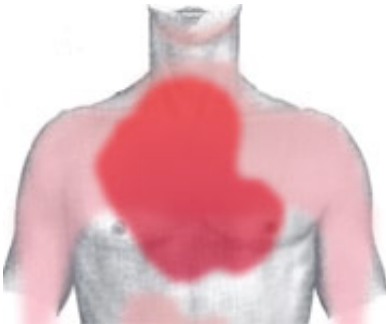


# Pain could be a good thing for heart attack patients

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Feeling the pain of a heart attack could actually help the heart minimise damage, say academics in the University of Bristol's School of Clinical Sciences.

The study, co-funded by the British Heart Foundation (BHF) and the European Union, showed that during a [heart attack](#) – when a blood clot blocks an artery serving the heart with oxygen – pain signals from cardiac nerves may help attract stem cells to the site of the blockage to repair some of the damage.

Around 124,000 people in the UK each year have a heart attack. The symptoms can include chest pain – a feeling like a belt tightening around your chest. As a blockage cuts off the oxygen supply to the heart, cells die and the heart often suffers permanent damage.

This new study, published in the American Heart Association journal [Circulation](#), shows that a key molecule in the body's ability to sense pain, called Substance P, is released from nerve terminals in the heart during a heart attack. Substance P then mobilises stem cells from the bone marrow to the site of the artery blockage. The stem cells have the ability to generate new vessels to bypass the blockage and restore some of the blood flow.

After initial experiments in mice, the researchers went on to show that the Substance P released by cardiac nerves may play a role in stem-cell mediated recovery after a heart attack in human patients. The discovery points to a new possible route for future therapies to repair a damaged heart.

Professor Paolo Madeddu, Chair of Experimental Cardiovascular Medicine in the School of [Clinical Sciences](#) and Bristol Heart Institute at the University of Bristol, who led the study, said: "After a heart attack, the heart can't mend itself properly. That's why tens of thousands of heart attack patients in the UK are affected by the debilitating symptoms of heart failure.

"Our discovery shows that pain receptors are involved in repairing damaged blood vessels, through recruiting [stem cells](#), could point towards new ways to harness the body's natural mechanisms of repair. The ultimate aim is to develop a therapy which will regenerate the muscle damaged or lost after a heart attack."

Dr Hélène Wilson, Research Advisor at the British Heart Foundation (BHF), which co-funded the study, said: "Pain is a very complicated process. It's not just the body's way of warning you that something is wrong – when we feel pain, it can also be a sign that the body is doing what it can to fix the problem.

“As well as opening up exciting new avenues for new heart repair treatments, this discovery highlights the potential role of pain in our natural response to having a heart attack. The pain of a heart attack is extremely distressing for patients, and we have to do everything we can to keep it to a minimum. But this discovery opens up the possibility that in the future we might be able to harness [pain](#) more effectively in the crucial window just after a heart attack, when there could be an opportunity to keep damage to a minimum.”

The study was funded by a £200,242 research grant from the BHF and a grant from the [European Union](#).

**More information:** Role for Substance P-based nociceptive signaling in progenitor cell activation and angiogenesis during ischemia in mice and in human subjects, Silvia Amadesi, et al, *Circulation* 2012, originally published online March 5, 2012. [doi: 10.1161/CIRCULATIONAHA.111.089763](#)

Provided by University of Bristol

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