

Stem cell treatments improve heart function after heart attack

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Stem cell therapy moderately improves heart function after a heart attack, according to a systematic review published in The Cochrane Library. But the researchers behind the review say larger clinical trials are needed to establish whether this benefit translates to a longer life.

In a [heart attack](#), the [blood supply](#) to parts of the heart is cut off by a blocked artery, causing damage to the [heart tissue](#). The cells in the affected area start to die. This is called necrosis and in the days and weeks that follow, the necrotic area may grow, eventually leaving a large part of the heart unable to contract and increasing the risk of further [heart problems](#). [Stem cell therapy](#) uses cells from the patient's own bone marrow to try to repair and reduce this damage. Currently, the treatment is only available in facilities with links to scientific research.

The authors of the review drew together all the available evidence to ask whether adult bone marrow stem cells can effectively prevent and repair the damage caused by a heart attack. In 2008, a Cochrane review of 13 stem cell therapy clinical trials addressed the same question, but the new review adds 20 more recent trials, drawing its conclusions from all 33. By incorporating longer follow up, the later trials provide a better indication of the effects of the therapy several years after treatment.

The total number of patients involved in trials was 1,765. All had already undergone angioplasty, a conventional treatment that uses a balloon to open the blocked artery and reintroduce the blood supply. The review's findings suggest that stem cell therapy using bone marrow-derived stem

cells (BMSCs) can produce a moderate long-term improvement in [heart function](#), which is sustained for up to five years. However, there was not enough data to reach firm conclusions about improvements in [survival rates](#).

"This new treatment may lead to moderate improvement in heart function over standard treatments," said lead author of the study, Enca Martin-Rendon, of the Stem Cell Research laboratory, NHS Blood and Transplant at the John Radcliffe Hospital in Oxford, UK. "Stem cell therapy may also reduce the number of patients who later die or suffer from heart failure, but currently there is a lack of statistically significant evidence based on the small number of patients treated so far."

It is still too early to formulate guidelines for standard practice, according to the review. The authors say further work is required to establish standard methods, including cell dosage, timing of cell transplantation and methods to measure heart function. "The studies were hard to compare because they used so many different methods," said Martin-Rendon. "Larger trials with standardised treatment procedures would help us to know whether this treatment is really effective."

Recently, the task force of the European Society of Cardiology for [Stem Cells](#) and Cardiac Repair received funding from the European Union Seventh Framework Programme for Research and Innovation (EU FP7-BAMI) to start such a trial. Principal Investigator for the BAMI trial, and co-author of this [Cochrane review](#), Anthony Mathur, said, "The BAMI trial will be the largest stem cell therapy trial in patients who have suffered heart attacks and will test whether this treatment prolongs the life of these patients."

More information: Clifford DM, Fisher SA, Brunskill SJ, Doree C, Mathur A, Watt S, Martin-Rendon E. Stem cell treatment for acute

myocardial infarction. Cochrane Database of Systematic Reviews 2012, Issue 2. Art. No.: CD006536. [DOI: 10.1002/14651858.CD006536.pub3](https://doi.org/10.1002/14651858.CD006536.pub3)

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