

# Regenerative medicine: Researchers develop new tool for transplanting stem cells

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Mayo Clinic researchers and colleagues in Belgium studies are the outcome of years of [basic science research](#) at Mayo Clinic and earlier clinical studies with Cardio3 BioSciences and Cardiovascular Centre in Aalst, Belgium, conducted between 2009 and 2010.

have developed a specialized catheter for transplanting stem cells into the beating heart. The novel device includes a curved needle and graded openings along the needle shaft, allowing for increased distribution of cells. The result is maximized retention of stem cells to repair the heart. The findings appear in the journal *Circulation: Cardiovascular Interventions*.

Provided by Mayo Clinic

"Although biotherapies are increasingly more sophisticated, the tools for delivering regenerative therapies demonstrate a limited capacity in achieving high cell retention in the heart," says Atta Behfar, M.D., Ph.D., a Mayo Clinic cardiology specialist and lead author of the study. "Retention of cells is, of course, crucial to an effective, practical therapy."

Researchers from the Mayo Clinic Center for Regenerative Medicine in Rochester and Cardio3 Biosciences in Mont-Saint-Guibert, Belgium, collaborated to develop the device, beginning with computer modeling in Belgium. Once refined, the computer-based models were tested in North America for safety and retention efficiency.

What's the significance?

- The new curved catheter eliminates backflow and limits loss of cells
- Graded small to large side holes limit pressures in the heart to keep cells targeted
- The design has proved to be more effective in both healthy and damaged hearts

This new catheter is being used in the European CHART-1 clinical trials, now underway. This is the first Phase III trial to regenerate hearts of patients who have suffered [heart attack damage](#). The

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