

Umbilical cord cells outperform bone marrow cells in repairing damaged hearts

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A study published this month by researchers at the University of Toronto and Toronto's Princess Margaret Hospital has shown that cells derived from the umbilical cord, "Human Umbilical Cord PeriVascular Cells" (HUCPVCs), are more effective in restoring heart function after an acute myocardial infarction (in common parlance, a heart attack) in a pre-clinical model than a similar cell population derived from bone marrow.

At present, mesenchymal cells, known to release a series of factors that stimulate tissue repair, and control inflammation, are most commonly harvested from bone marrow. But the new study, headed by Dr. Armand Keating, now suggests that umbilical cord cells outperform bone marrow cells in improving heart muscle function.

The study, released in [Cell Transplantation](#) this month, demonstrates that the cells originating from the tissues surrounding the blood vessels of the human umbilical cord, also known as "Wharton's Jelly," outperformed the current gold standard for stem cell therapies for repairing damage to heart muscles, after an induced heart attack when injected directly into the affected area. Dr. Keating calls the HUCPVC results "statistically and significantly better" than [bone marrow cells](#).

Standard heart function tests measured the effect of the therapy after the cells were injected. The HUCPVC cell therapy was twice as effective at repairing damage to heart tissue than no treatment.

"We are hoping that this translates into fewer people developing

complications of heart failure because their muscle function after a heart attack is better," states Keating.

Keating and his team will now complete additional pre-clinical studies, and hope to begin clinical trials of the HUCPVC cells on patients within 12-18 months.

Keating is also interested in conducting further research with the umbilical cord cells to overcome the damaging effects of chemotherapy on [heart tissue](#), an agonizing problem for some patients who may be cured of their cancer only to confront heart failure as a result of treatment.

Apart from heart disease, clinical trials with mesenchymal cells are conducted around the world to investigate the treatment of a variety of diseases, including a serious complication of bone marrow transplantation called graft-versus-host disease, autoimmune disorders, neurological diseases and tissue injury arising from lung and liver disease. Today, more than 250 clinical trials are currently being conducted worldwide using [mesenchymal cells](#).

Provided by University of Toronto

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