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Mending Broken Hearts: New Machine Could Increase Number Of Transplants

By [India Adams](#) Location: Sunderland

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Human hearts wasted because they're deemed unsuitable for transplant could get a second chance to save lives thanks to pioneering research at two North East universities.

Researchers at both [Sunderland](#) and [Newcastle](#) have developed a new machine that helps identify suitable donors by restarting the heart and keeping it beating while doctors carry out rigorous tests to see whether it is fit for transplantation.

In 2012, there were 652 potential donors but only 138 hearts were deemed suitable for transplant. Researchers believe this developing technology could potentially use more of the declined donor hearts, helping to reduce transplant waiting lists and could be ready for clinical use within a year.

Dr Noel Carter, senior lecturer in molecular biology at the University of Sunderland's Faculty of Applied Sciences, said: "Heart surgeons have to be 100 per cent positive that this vital organ is going to work before transplantation, which is why a number of them end up not being used.

"Our research wants to take those rejected hearts, get them restarted, carry out echocardiograms and tests in a sterile environment to check activity and show them to be in perfect working order. We believe then a proportion could be reconsidered for transplantation."

As a result of successful pre-clinical tests in the lab to get dead pigs' hearts beating once again, clinical trials are to begin on human hearts that would not otherwise have been used after ethical approval was granted by National Research Ethics service in Newcastle.

Dr Carter explained: "We have demonstrated enough evidence in our results from restarting pigs' hearts after several hours of being clinically dead, to be able to begin clinical testing on human hearts that are considered too marginal to be used for transplant or as a source of heart valves.

The research team has developed a novel circulatory equipment and defibrillators to pump warm, oxygenated blood through the hearts and used dialysis to filter out unwanted products from the circuit thereby restoring the heart's metabolic activity.

Dr Carter added: "We are devising a series of parameters to test the hearts and ensure that they would be viable if a transplant goes ahead. We believe this could offer new hope for patients and see a greater increase in heart transplants."

Also collaborating on the research is Professor David Talbot, Dr Guy MacGowan, Mr Stephen Clarke and Professor John Dark who all work at Newcastle's [Freeman Hospital](#).

The work is the research project of University of Sunderland PhD student Omar Mownah, a clinical fellow and trainee surgeon, and Susan Stamp, research technician from Newcastle University.

Professor Talbot said "Heart transplantation rates are dwindling year on year within the UK and abroad.

"This is partly good news as deaths from head injuries through road traffic accidents have fallen but other organ transplants such as the liver and kidney have managed to increase the use of more marginal and older donors.

"This is often not possible for the heart due to heart disease and the effect of certain drugs on the heart toward the end of life.

"As a result patients with cardiac failure are increasingly using mechanical devices to support their own hearts as a definitive treatment rather than them being a bridge until a heart transplant becomes available."