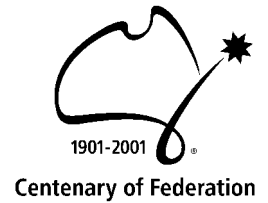


**Questacon**

# Australian Ticker



A smaller, safer, more reliable, less expensive artificial heart under development by a team of Australian researchers could extend the life of large numbers of people worldwide.

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## WHAT'S THE PROBLEM?

More than 800 000 people worldwide suffer from the final stages of Congestive Heart Failure (CHF) - a condition in which the heart has been weakened by disease. There is currently no drug that can cure this problem. A heart transplant may be suitable for some patients, but this treatment is limited due to a shortage of available donor hearts. An artificial heart is the answer.

Current generation artificial hearts have kept about 5 000 patients with CHF alive until they could receive a transplant. These artificial hearts are expensive and large and not suitable as a permanent alternative to transplantation.

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## A GREAT AUSSIE SOLUTION



Small, reliable, energy efficient and long lasting—these are the characteristics that make the new Micromedical's VentrAssist artificial heart so much better, and even suitable for children with certain heart problems.

The VentrAssist artificial heart is a project involving a number of different Australian researchers. Staff at the School of Engineering at the University of Technology Sydney are partners in developing the rare earth magnet motor. The Graduate School of Biomedical Engineering, UNSW is helping to analyse the flow of fluid in the device and measuring blood damage. The University of Sydney is evaluating different coatings for blood compatibility. Animal trials are being conducted by The Alfred Hospital in Melbourne, where clinical trials will also be carried out.

A cut-away mannequin showing the VentrAssist artificial heart.

Courtesy of MicroMedical Industries

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## HOW DOES IT WORK?

The VentrAssist artificial heart is a unique blood pumping system designed to provide support for a weakened heart. The patient's natural heart remains in place while the artificial heart takes over as much of the pumping as required for daily activities.

The VentrAssist artificial heart is based on a rotary pump design. A distinctive method is used to suspend the rotor, without conventional bearings, shafts or seals. This increases reliability and greatly reduces the chance of blood damage and clotting. There is only one moving part and this is made from a titanium alloy which is safe for use inside people. A battery and controller are worn externally.

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## THE FUTURE

This type of artificial heart could well be a long-term alternative to a transplant. Recent research has shown that normal cardiac function will sometimes return permanently to a heart if it is given the opportunity to rest and recover. The VentrAssist artificial heart can be used to retain lifestyle while a heart is recovering, and the device can be removed once the heart is recovered. This is the ideal situation since the patient can return to normal life and will not require care on a long-term basis.

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## FURTHER INFO, FACTS & FUN

- Recovery of a heart occurs in up to 40% of patients when their heart is rested.
- The VentrAssist artificial heart was tested for function under difficult situations using the Earthquake machine at Questacon - The National Science and Technology Centre.
- Heart rates vary greatly. Superfit athletes with large hearts can have extremely low pulse rates – as low as 25 beats per minute when resting. Very high pulse rates are recorded in extreme situations of activity and stress, even over 200 beats per minute.
- Try taking your own pulse rate as you do different activities, but be careful, don't overexert yourself if you are not used to it.
- For more info on VentrAssist check out:  
<http://www.ventrassist.com>  
<http://www.micromed.com.au>

### For more info on great Australian Science check out:

Questacon's Innovative Australians <http://www.questacon.edu.au/innovaus>

CSIRO's Australia Advances <http://www.csiro.au/promos/ozadvances>

The Australian Academy of Science's Nova <http://www.science.org.au/nova>

The Australian Science Archive Project <http://www.asap.unimelb.edu.au/>