The gift of life … straight from the heart

EXCLUSIVE

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Alexandra Moroianu was not sure she would make it.

In the cardiac ward of a Perth hospital waiting for a donor heart, adrenaline fed through her veins from a drip was the only thing keeping her alive as her failing heart struggled to pump blood.

"I was very grey, I was so pale that I was see-through," Ms Moroianu says.

"My heart was so enlarged, it would shake my body with every pump."

Although doctors did not know why their young patient's heart was failing, they knew she would not survive long without a transplant. She was placed on the waiting list, but in Western Australia hearts are donated only about once every four or five days, and not all donated hearts are suitable. The east coast was too far away for a donor heart to be transported and survive.

Deprived of oxygen, the precious organs deteriorate fast – within four to five hours – and it's a race against time. Three out of four donor hearts nationally are currently discarded.

"In the past 40-odd years, we have been able to send people to the moon – but we are still using basically bags of ice to transport donor hearts," says the founder of the Critical Care Research Group at Prince Charles Hospital, John Fraser.

"It reduces the amount of oxygen debt, it stops swelling to a degree, but bit by bit cells are dying because the heart is deficient of oxygen and it's got no food."

Now, an extraordinary invention, initiated by Swedish professor Stig Steen and advanced by Australian doctors, has changed the game of organ transplants.

Thanks to a joint research effort by Brisbane's Prince Charles Critical Care Research Group, Sydney's St Vincent's and Melbourne's Alfred hospitals – and supported by the charity The Common Good – donor hearts can now be kept alive for as long as 11 hours using a specially designed transportable device that pumps a donor heart with blood, oxygen

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and nutrients. It means that for the first time, all hearts donated in Australia can be used in any transplant program in the country, and no heart will go to waste.

"This is the biggest advance in transplant medicine in 50 years," says Professor Fraser, the founder of CCRG which led the project.

A clinical trial using the world-first heart transplant technology – dubbed the Living Heart Project – began a year ago and has so far saved the lives of 36 people. One of the hearts was kept alive for eight hours and 47 minutes.

Ms Moroianu, who holds a masters degree in astrophysics, is one of those whose lives have been saved. Last spring, a donor heart from the east coast was transported to Perth to save her life.

It now holds the world record for the greatest distance a donor heart successfully transplanted has ever travelled.

Ms Moroianu's mother Mihaela said that when the family received news that the Living Heart Project could supply Alex with a heart, her daughter's ailing ticker was pumping at less than 10 per cent capacity, her young body was full of fluid, and she weighed only 43kg. They later learned that a virus had triggered a condition called lymphocytic myocarditis which caused Alex's heart to fail.

"We just felt so helpless," Mihaela says. "She is our only child. I couldn't understand why she was chosen to go through this … the only thing I could do was pray."

Ms Moroianu was initially considered to be too sick to receive a heart via the clinical trial. But retired surgeon David McGiffin – who is the Co-Principal Investigator of the clinical trial with The Alfred's David Kaye – happened to visit her in the Fiona Stanley Hospital and she was immediately placed on the clinical trial.

"When I got the call on a Sunday morning that a heart was coming for Alex, it was the best news of my life," says Mihaela.

As the Moroianu family waited anxiously in Perth, on the east coast her donor heart was carefully prepared for the long journey. It was placed inside the special transportation device – known as Hypothermic Ex Vivo Perfusion (HEVP) – and pumped full of what Professor Fraser describes as "medical Gatorade".

"Instead of putting the heart on ice, we basically plumb it into a system of pipes," Professor Fraser says. "You give it a special 'medical Gatorade' mix of nutrients and good vitamins and good chemicals. And you perfuse the heart with oxygen-rich blood."

When the precious box containing Alex's new heart arrived at Fiona Stanley Hospital, surgeons immediately got to work.

As their fragile young patient was wheeled into the operating theatre, medics played Alex's favourite song, Alina Baraz's Electric.

Worried mum Mihaela waited on tenterhooks as the long operation progressed. Afterwards, as her daughter lay intubated, one moment shared with her unconscious daughter filled the Romanian-born nurse with relief and hope.

"Before she went into surgery, every day I would say 'Alex I love you', and she would say 'I love you more," Mihaela says. "I told her after the surgery 'I love you so much', and she just shook her hand, making the sign to say 'I love you more'. I knew she was my Alex. She was back with us. That will stay with me forever."

As for Alex, she is now dedicating her life to promoting awareness around heart transplants.

She said her experience proved that fundraising for medical research – such as that done to support the Living Heart Project by The Common Good – was transformational.

"I've always been someone who appreciated the little things, but I think I love life even more than I did before," she says.

"I guess if all of this had happened to me one month earlier, if the trial wasn't ready, I don't know if I'd be here."

The Common Good general manager Chloe Nguyen said it was rewarding and gratifying for the charity's generous community who had donated to see that "what started off as a preclinical trial has resulted in 36 lives saved and counting".

The doctors are now focused on using their invention to "reboot" damaged donated hearts, which at the moment have to be discarded. They hope they will be able to increase the number of viable transplant hearts by up to 40 per cent while extending the lives of donees by decades because they receive better-quality hearts.

"What we have achieved to date with our experimental work and clinical trial in Australia and New Zealand has the potential to change the practice of cardiac transplantation worldwide," said Professors McGiffin and Kaye.

"In this next phase, our goals are to increase clinician confidence in using this technology and improve the utilisation rate of donated hearts."

MAIN PICTURE: TONY McDONOUGH

Heart transplant patient Alexandra Moroianu, 24, is loving her new lease on life; below, recovering in Perth's Fiona Stanley Hospital

MAIN PICTURE: TONY McDONOUGH

An eternally grateful Alexandra Moroianu on the beach near her home in Western Australia; and, below from left, John Fraser and David McGiffin with the device that preserves hearts far longer than previously possible; Alexandra with the miracle machine that saved her; and recovering well in hospital