

New way of preserving kidneys for transplant trialled successfully at NUH

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A new way of preserving kidneys before they are implanted in kidney transplant patients has been trialled successfully on three patients at National University Hospital (NUH).

Called hypothermic machine perfusion, the procedure involves using a specialised machine to pump cold preservation fluid below 4 deg C into the donor kidneys to optimise them for implantation. The process reduces the risk of the renal transplant failing to function immediately.

The team of doctors from NUH's National University Centre for Organ Transplantation (Nucot) involved in piloting the method in Singapore is working with the National Organ Transplant Unit under the Health Ministry to nationalise the technique.

Kidney transplants are consi-

dered the best treatment for patients suffering from end-stage kidney disease, as it brings better clinical outcomes, in terms of patient survival, cost-effectiveness and allowing the patient to resume a normal life post-transplantation.

About 30 per cent of deceased donor kidney transplants in Singapore are at risk of a complication called delayed graft function, where the renal transplant fails to function immediately and dialysis is needed in the first post-transplantation week.

Patients with delayed graft function would have to be hospitalised longer, have a longer road to recovery, and face larger medical bills.

But using hypothermic machine perfusion, the risk of delayed graft function can be reduced by 43 per cent, said Assistant Professor Benjamin Goh, a consultant with Nucot's adult kidney transplantation programme, citing a study published in the New England Journal of Medicine in 2009.



Assistant Professor Benjamin Goh with Madam Sapiah Isnin, 66, who "feels like a free bird" after her kidney transplant. ST PHOTO: GAVIN FOO

Prof Goh first came across this method in 2019 when he was doing his fellowship in London.

He said that compared with the traditional way of preserving an or-

gan on ice before transplantation, hypothermic machine perfusion simulates the body's way of pumping liquid into the kidney, improving the washout of micro blood

clots and toxins.

"It will seek to keep all the little blood vessels open as it pumps and stops. By the time you implant it into the patient, the kidney is ready to take the (human body) blood flow, because it has already been simulated for three to four hours."

In order to shorten the waiting times for transplants, kidneys are sometimes accepted from older and higher-risk deceased donors with multiple comorbidities.

The quality of these kidneys can be improved with hypothermic machine perfusion, said Associate Professor Tiong Ho Yee, surgical director at Nucot's adult kidney transplantation programme.

"In the longer term, what we are hoping for is that all patients, or at least the deceased donor kidney cases, will be put on hypothermic machine perfusion... And for kidneys on the borderline, it can help to tell us which ones we can use and which ones maybe we shouldn't use," added Prof Tiong.

NUH currently has two of the machines, which cost US\$20,000 (S\$27,000) each. Subsidised patients will pay about \$1,500 if they opt for the procedure, to cover the cost of the sterile consumables.

Madam Sapiah Isnin, 66, was the first patient to have hypothermic machine perfusion for her kidney transplant procedure on Oct 6, 2022. She was diagnosed with cysts in her kidneys that caused reduced renal function in 2008, and she required thrice-weekly dialysis from 2013.

"After my dialysis sessions, I would feel very weak and my shoulders would feel heavy. I would also be in a bad mood," she said.

After undergoing the kidney transplant, Madam Sapiah did not have delayed graft function and made a full recovery. She no longer has to endure frequent dialysis.

"I feel like a free bird now!" she said.

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