

Headline  
Date  
Media Title  
Section  
Page No  
Circulation  
Readership

New dialysis device set to give fresh hope

12. Jul 2008

Language ENGLISH

The Business Times

Wellness

Article Size 858 cm2

Frequency Daily

Color Full Color

AdValue 5499.02



# New dialysis device set to give fresh hope

A treatment which serves as a good alternative to kidney transplants may give patients fresh hope, writes **CHEAH UI-HOON**

**K**IDNEY transplants – and the debate as to whether it's ethical or not – could well be a thing of the past in just two years.

That's because a Singapore company has come up with a new dialysis system called Automated Wearable Artificial Kidney (AWAK) that pretty much functions as natural kidneys – without tying the patient down to a machine.

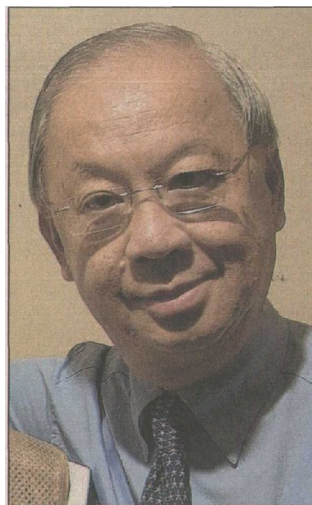
"If the clinical trials are successful, then this will be revolutionary," says Dr Gordon Ku, a kidney specialist. "Kidney transplants – which come with its own set of risks – won't be absolutely necessary for those suffering from end-stage renal failure, as AWAK is a viable alternative."

AWAK is an improvement on peritoneal dialysis and works on the principle of Singapore's Newater concept.

"We put the two together, to get a 24-hour dialysis system that can be easily carried around by the patient," explains Dr Ku, the chairman of AWAK Technologies, the company which is developing it. Dr Ku is also the founder and chairman of the Kidney Dialysis Foundation.

Two US doctors, one of whom was Dr Ku's schoolmate in medical school, had been working on the concept for more than 20 years, but couldn't get the funding or know-how to develop it commercially. It wasn't until Dr Ku got wind of it and got things going.

Their start-up, AWAK Technologies, partnered with Singapore's Temasek Polytechnic to refine the technology and design. After just a year, the wearable dialysis system which is built into a vest is now ready and is



**Dr Ku:** 'Kidney transplants won't be necessary for those suffering from end-stage renal failure, as AWAK is a viable alternative.'

set to undergo clinical trial on eight patients at Singapore General Hospital, and another eight in Los Angeles by year end.

After the trial, it will take about a year to further refine the design, and it should be marketed commercially by 2011, reckons Neo Kok Beng, the chief executive officer of AWAK Technologies.

There are currently two types of dialysis for patients with end-stage kidney failure. More common in Singapore is haemodialysis, where patients have their blood circulated through a filter (dialyser) by a kidney machine

to have the waste and excess fluid removed, and cleansed blood is directed back into the body.

"The problem with this is that it's very inconvenient, as patients have to go to a dialysis centre to have it done three times a week. You need to have vascular access, and patients also have to be on anti-coagulant to thin their blood," says Dr Ku.

The other method is peritoneal dialysis, which is less popular and used by some 30 per cent of kidney patients here. In some countries like Hong Kong, where there's a better management system for it, majority of patients use peritoneal dialysis as opposed to haemodialysis.

For peritoneal dialysis, the blood is cleansed within the body itself – in the peritoneal cavity inside the abdomen. The abdomen is filled with two litres of dialysate solution through a catheter implanted below the patient's navel. Nitrogenous waste, excessive electrolytes and water will diffuse from the blood vessels lining the peritoneum into the dialysate solution. The spent fluid in the abdomen has to be drained out and replaced up to four times a day.

"The problem with this is that patients have a high chance of infection when they do exchanges of fluid frequently, plus they have to be using eight litres of dialysate a day," says Dr Ku. Then there's protein loss in the spent dialysis fluid.

AWAK's *modus operandi* is based on peritoneal dialysis, but by using sorbent technology that recycles the dialysate, so that the fluid is continuously cleansed and regenerated.

With this, patients need only use one litre of dialysate for up to six months, instead of eight litres a day.

Headline **New dialysis device set to give fresh hope**  
Date **12. Jul 2008**  
Media Title **The Business Times**



PHOTOS: JOHN HENG

**Life saver:** *The wearable dialysis system which is built into a vest is now ready and is set to undergo clinical trial on eight patients at Singapore General Hospital, and another eight in Los Angeles by year-end.*

It also does away with the need to make fluid exchanges frequently, thus cutting down the inconvenience, time spent and risk of infection. The sorbent system also contains chemical which has anti-bacteria effect, and there won't be protein loss from the body.

"The key is in this sorbent technology, which will be patented, as it allows for the same one litre of dialysate to be recycled in the abdominal cavity so patients don't have to keep changing fluids," points out Mr Neo. The regeneration of the spent dialysate is the concept that's similar to

NEWater. For this first model, the one litre of dialysate will need to be replaced only in six months.

For the prototype, the dialysis mechanism is mounted in two front compartments in a mesh vest so that wearers can go about their daily activities. At night, they just take it off and place it next to them.

The cost of AWAK will likely be priced lower than haemodialysis and peritoneal dialysis as well, says Mr Neo. Currently it costs patients here \$2,400 a month for haemodialysis and \$1,500 for peritoneal dialysis.

Mr Neo says optimistically that the

Temasek Polytechnic team – comprising members from the engineering, design and applied science schools – will likely be able to reduce the size of the mechanisms; and even develop water-proof versions in the future so that kidney patients can swim and be involved in other types of sports.

"AWAK is a good alternative to kidney transplantation, where patients have to be on immunosuppressant drugs, which are costly and can have harmful side-effects, for life. It really offers a revolutionary form of treatment and new lease of life to kidney patients," concludes Dr Ku.