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Murmurs

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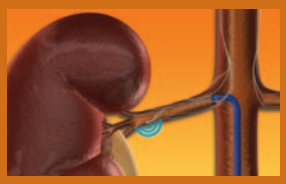
HIGHLIGHTS

- Renal Denervation for Treatment-resistant Hypertension
- Fellowship in Cardiothoracic Surgery
- We are BCM-recertified



NHCS Introduces New Aquapheresis Therapy for Fluid Overload

Dr David Sim (left), Consultant, Department of Cardiology and Co-Director, Heart Failure Programme, National Heart Centre Singapore (NHCS) explaining the new Aquapheresis therapy to his patient, Mr Soh Teow Cheng.

Within a short space of two weeks, Mr Soh Teow Cheng puts on 15.5 kilograms. "I couldn't walk, and would feel breathless covering a distance of less than 10 metres. The swelling in my abdomen was so bad, I looked like I'm 10 months pregnant," said the 59-year-old heart failure patient.

Mr Soh had a condition known as fluid overload where excess fluid (mainly salt and water) accumulates in the body. For most patients, they are treated with diuretics, commonly known as "water pills," to help the body get rid of unneeded water and salt through the urine. However, about 20 to 30 per cent of these patients suffer from diuretic resistance, as in Mr Soh's case. He was recommended the new therapy known as Aquapheresis.

Safe and Effective Way to Remove Fluid

Aquapheresis, a form of ultrafiltration, helps heart failure patients with fluid overload remove excess salt and water from the body safely and effectively. Using the Aquadex FlexFlow, the device-based therapy is targeted at those who do not respond well to diuretics. Aquapheresis helps to relieve symptoms such as weight gain, swelling in the legs, arms and abdomen, difficulty in breathing and fatigue. This will help heart failure patients reduce their readmissions, length of hospital stay, unscheduled clinics and emergency room visits. The National Heart Centre Singapore is the first in Asia to introduce Aquapheresis in October 2011.

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During Aquapheresis, trained medical personnel will insert catheters in selected veins in the patient's body. Once in place, the catheters are connected to the blood filter circuit. The filter removes the excess fluid (salt and water) from the blood and re-circulates the blood back to the body. Mr Soh was started on the new therapy on 8 November 2011. After the treatment, his net weight loss was 8.8 kilograms and fluid loss was 12 litres over 48 hours. His symptoms were relieved and he was discharged well after five days.

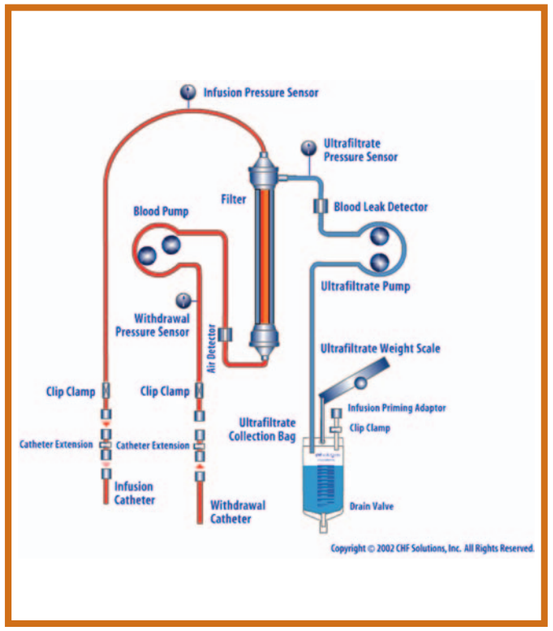
Visibly relieved after the therapy, Mr Soh said, "After the treatment, I can walk so much better and can continue to work as a taxi driver."

Reduces Readmissions and Length of Stay

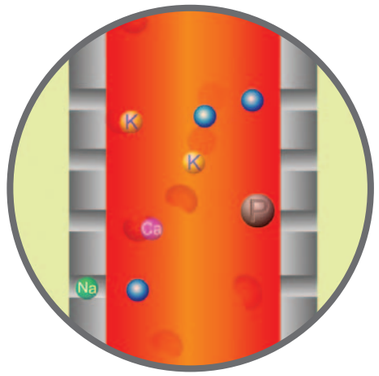
Dr David Sim, Consultant, Department of Cardiology and Co-Director, Heart Failure Programme, NHCS said, "Fluid overload accounts for over 90 per cent of hospitalisations for heart failure patients. The introduction of Aquapheresis therapy can be used as a more efficient method of fluid removal. This helps to improve the quality of life for the patients with a shorter length of hospital stay."

The safety and efficacy of the new therapy is shown in a major clinical trial (UNLOAD trial) involving 200 patients at 28 centres in the United States. The trial compared ultrafiltration with standard intravenous diuretic therapy. The results showed that at 48 hours, the ultrafiltration group had 38 per cent greater weight loss and 28 per cent greater net fluid loss than the diuretics group. At 90 days, the ultrafiltration group saw 50 per cent reduction in re-hospitalisation episodes, 63 per cent reduction in total re-hospitalised days and 52 per cent reduction in unscheduled clinic/emergency room visits.

To date, a total of 10 patients have successfully received the Aquapheresis therapy. In Singapore, heart failure is a top cause for cardiac admissions at about 5,000 cases yearly. NHCS sees about 1,000 cases each year. The centre estimates about 50 patients will benefit from the Aquapheresis therapy.



Fluid Path Diagram of the Aquapheresis therapy.

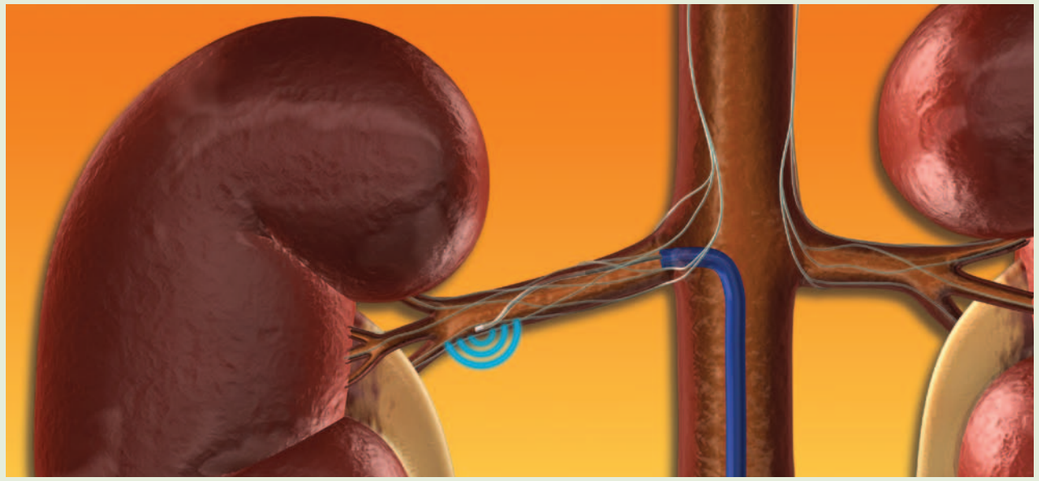


A close-up view of the smaller molecules of sodium and water being removed from the blood.

About Fluid Overload

- Fluid overload is a condition in which more fluid is going into your body than is coming out.
- This fluid, primarily salt and water, builds up in various locations in a patient's body and leads to an increase in weight, swelling in the legs and arms, and/or in the abdomen.
- This fluid enters the air spaces in the lungs, reduces the amount of oxygen that can enter the blood, and causes shortness of breath.
- Fluid can also collect in the lungs when a patient lies down at night and can make night time breathing and sleeping difficult.
- Fluid overload can be caused by many reasons, including problems with the heart, kidneys, liver, lungs or a combination of any of these vital organs.

Renal Denervation for Treatment-resistant Hypertension



In renal denervation, the cardiologist guides a catheter to the renal artery and delivers radiofrequency energy from the tip of the catheter to destroy the nerves in the renal arteries to modulate blood pressure. Image courtesy of Medtronic, Inc.

For years, Mr Leow Cheng Hai was plagued by persistent hypertension. Taking four types of medications did not even help. He was always tired and did not feel like getting out of the house.

In Singapore, about one in four adults has high blood pressure. Persistent hypertension is a risk factor for stroke and heart disease. A/Prof Lim Soo Teik, Head and Senior Consultant, Department of Cardiology, National Heart Centre Singapore (NHCS) said, "Research has shown that each incremental 20/10 mmHg increase of blood pressure above normal levels directly correlates to a doubling of cardiovascular mortality over a 10-year period."

Normal blood pressure is defined as below 130/80 mmHg. "Hypertensive patients should get their blood pressure below 140/90 mmHg, and diabetic hypertensive patients even lower, to 130/80 mmHg," A/Prof Lim added.

Lowers Risk of Stroke, Heart Disease and Death

Mr Leow's doctor, Dr Chin Chee Tang, Consultant, Department of Cardiology, NHCS suggested a new minimally invasive procedure known as renal denervation to him. During the procedure, a catheter is guided to the renal artery via an opening at the groin area.

Radiofrequency energy is then delivered from the tip of the catheter to selectively disable renal nerves within the sympathetic nervous system to modulate blood pressure.

The safety and efficacy of renal denervation was demonstrated in the Symplicity HTN-2 Trial which involved 106 patients at 24 overseas centres. At six months, 84 per cent of renal denervation patients had ≥ 10 mmHg reduction in systolic blood pressure. There was also no serious device or procedure-related adverse event.

Elaborating on the impact of this new treatment, Dr Chin said, "Studies have shown that a 5 mmHg reduction in blood pressure results in 14 per cent decrease in stroke, 9 per cent decrease in heart disease and 7 per cent decrease in death. Previously once hypertensive patients are at the maximal dose of medications, there was no other good option to further control their blood pressure. Renal denervation presents a new viable treatment for these patients."

Two weeks after the procedure, Mr Leow's blood pressure has dropped from 190 mmHg to 150 mmHg, a significant drop of 40 mmHg. "Last time, I'm always very tired like a sick person. Now, I feel more energetic," he said.

Fellowship in Cardiothoracic Surgery

Dr Soon Jia Lin (2nd from right) performing his last transapical transcatheter aortic valve implant at St Paul's Hospital with Dr John Webb (left) and Dr Jian Ye (right).

This issue, the Murmurs team speaks to Dr Soon Jia Lin, Associate Consultant, Department of Cardiothoracic Surgery at the National Heart Centre Singapore (NHCS) on his rigorous fellowship at the John Radcliffe Hospital, Oxford, United Kingdom and the St Paul's Hospital, Vancouver, Canada from 2009 – 2011.

Why John Radcliffe Hospital and St Paul's Hospital

The John Radcliffe Hospital has the largest experience with the 3F valve which was part of the FDA device approval study. They have the longest follow-up on these patients as well. It was the only implanting centre in the UK for this new generation of aortic valves, and my fellowship coincided with the commencement of its participation in the FDA device approval trial.

The St Paul's Hospital performed the world's first transapical transcatheter aortic valve implantation, is the only transcatheter valve centre for west coast Canada, and the Edwards SAPIEN valve training centre for the west coast of North America. It is also a tertiary referral centre for high risk cardiac surgery, heart failure and transplant centre offering advanced cardiac mechanical support devices.

The Robust Training

I started my fellowship training in adult cardiac and thoracic surgery at the John Radcliffe Hospital and spent a year there. During this period, I learnt the aortic root surgery (including homograft root and valve-sparing root replacement), and the implantation of new generation stented, stentless and sutureless aortic valves. The following year was spent at the St Paul's Hospital where I focused on adult cardiovascular surgery with emphasis on transcatheter heart valve therapies and heart failure surgery.

When I'm not in the Operating Room, I worked on my research projects which have culminated in six publications in peer reviewed journals. Some collaborative works are still ongoing. I have also helped to refine the transapical transcatheter valve and cardiac assist device databases at the St Paul's Hospital.

The rigorous training allowed me to learn strategies and techniques to treat high risk 'older' patients whom were previously declined for conventional open heart surgery. Heart failure patients can now be treated using minimal access techniques. Together with technological advances, we can now offer these patients a better quality of life.

Memorable Experience

I spent 2009's Christmas operating and caring for a patient undergoing a second reoperative aortic root and mitral re-replacement that required perioperative extracorporeal membrane oxygenation (ECMO) support. I remembered him being transferred to the John Radcliffe Hospital from afar for surgery, and grasping my hand so tight in the intensive care unit on that snowy Christmas day, refusing to let me leave him when he was still ill. Seeing him well in the outpatient clinic just before I left the hospital, made my year worthwhile.

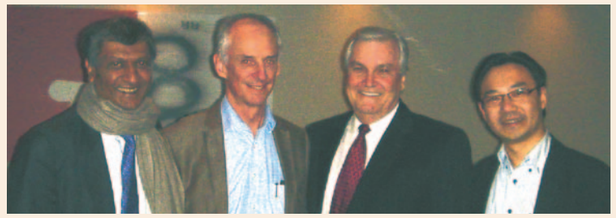
At the St Paul's Hospital, there was a patient with a second resternotomy for bailout transaortic aortic valve replacement due to failed transcatheter valve-in-valve for a degenerated bioprosthesis within a failed homograft root. He needed perioperative ECMO support but was subsequently discharged well from the hospital, having had a HeartWare HVAD cardiac assist device implanted.

These cases demonstrated the endless possibilities with the techniques and technology available today.

What's next

My newly acquired skills and knowledge will complement the range of minimally invasive cardiac surgeries offered at the NHCS. These include minimally invasive procedures for patients with aortic valve disease and patients with failed bioprosthesis in all positions. For patients with advanced heart failure, I plan to use the new generation of cardiac assist devices in the future, which are also amenable to minimal access implantation.

During the course of his training, Dr Soon Jia Lin made time for long walks around historical Oxford with his family. The walks kept them physically fit and gave them quality time together. They also gave him the opportunity to hone his photography skills, which he hopes to convert into paintings in the future.



Dr Soon Jia Lin (far right) with Dr Ravi Pillai (far left) from the John Radcliffe Hospital and Dr James L Cox (2nd from right), father of the Cox maze procedure for atrial fibrillation and inventor of the 3F valve, at a device implantation workshop in UK.

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NHCS CARDIOTHORACIC SURGERY SERVICES

Cardiac Surgery
- Conventional coronary artery bypass graft surgery
- Off-pump / beating heart surgery
- Congenital heart disease surgery
- Maze surgery for atrial fibrillation
- Left ventricular reconstructive surgery (also known as Dor or Saver surgery)
- Heart transplantation
- Valvular heart surgery including valve repair and replacement surgery
- Robotic-assisted surgery
- Endoscopic vein harvest

Aortic and Peripheral Vascular Surgery
- Abdominal aortic aneurysm surgery
- Peripheral vascular arterial surgery
- Thoracic and thoraco abdominal aorta surgery
- Surgery for acute and chronic arterial disorders
- Endovascular stent graft surgery for aortic aneurysm

Mechanical Heart Assist Device
- Left ventricular assist device (LVAD)
- Biventricular assist device (BIVAD)
- Extra-corporeal membrane oxygenation (ECMO) for acute cardio respiratory failure

Lung Cancer Multi-Modality Therapy
- Complete workup and full consultation with oncology and pulmonology consultants, prior surgical treatment

Thoracic Surgery
- Complete muscle sparing thoracotomy
- Video-assisted thoracoscopic surgery (VATS)
- Drainage of empyema
- Lung resection for cancer of the lung
- Lung transplantation for advanced lung disease
- Lung volume reduction surgery (LVRS) for chronic obstructive pulmonary disease (COPD)
- Mediastinoscopy for staging of lung cancer
- Minimally invasive (endoscopic) thoracic sympathectomy
- VATS pleurodesis for spontaneous pneumothorax

OUR CARDIOTHORACIC SURGERY SPECIALISTS	
Dr Kenny Sin Yoong Kong	Head and Senior Consultant
A/Prof Chua Yeow Leng	Senior Consultant
Dr Lim Chong Hee	Senior Consultant
Dr Lim See Lim	Senior Consultant
Dr Tan Teing Ee	Senior Consultant
Dr Lim Yeong Phang	Senior Consultant
Dr Victor Chao Tar Toong	Consultant
Dr Su Jang Wen	Consultant

For a comprehensive list of NHCS services and specialists, please visit **www.nhcs.com.sg**

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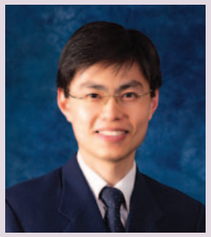
Appointments of Subspecialty Directorship

NAME	APPOINTMENT
DR TAN JU LE	Director, Adult Congenital Heart Diseases
A/PROF LIM SOO TEIK	Director, Cardiac Catheterisation Laboratory
DR K GUNASEGARAN	Director, Cardiology Fellowship Programme
A/PROF TAN RU SAN	Director, Clinical Trials
DR JACK TAN	Director, Coronary Care Unit
A/PROF DING ZEE PIN	Director, Echocardiography
DR LEE CHUNG YIN	Director, Education and Training
DR AARON WONG	Director, Interventional Cardiology
A/PROF TERRANCE CHUA	Director, Non-Invasive Laboratory
DR FELIX KENG	Director, Nuclear Cardiology
DR STANLEY CHIA	Director, Residency Programme
DR TEO WEE SIONG	Senior Advisor, Electrophysiology and Pacing
DR CHING CHI KEONG	Director, Electrophysiology and Pacing
DR BERNARD KWOK	Director, Heart Failure Programme
DR DAVID SIM	Co-Director, Heart Failure Programme
A/PROF PHILIP WONG	Director, Research and Development Unit
DR REGINALD LIEW	Deputy Director, Research and Development Unit
DR TAN TEING EE	Director, Cardiothoracic Surgery Intensive Care Unit
DR LIM YEONG PHANG	Director, Operating Theatre
DR KENNY SIN	Director, Quality Management
DR VICTOR CHAO	Director, Vascular Laboratory

Promotions



DR PAUL CHIAM
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DR EWE SEE HOOI
Consultant,
Department of Cardiology

NHCS wins National Safety and Security Watch Group (SSWG) Award

Mr Jimmy Sum, Manager, Support Services, NHCS (2nd from right) with the guest-of-honour, Mr Teo Chee Hean, Deputy Prime Minister and Coordinating Minister for National Security and Minister for Home Affairs, and the other winners at the National Safety and Security Watch Group Symposium and Award Ceremony on 18 November 2011.

NHCS, as part of SingHealth (together with SGH and KKH) has won the National Safety and Security Watch Group (SSWG) Award 2011 – Cluster Category. This is the third consecutive year NHCS received this prestigious award. The SSWG scheme is an initiative launched by the Singapore Police Force and Singapore Civil Defence Force to reach out to the business community in Singapore via engagement in local threat assessment and security enhancement. The award was presented by the guest-of-honour, Mr Teo Chee Hean, Deputy Prime Minister and Coordinating Minister for National Security and Minister for Home Affairs on 18 November 2011.

We are BCM-recertified

The National Heart Centre Singapore (NHCS) received the Business Continuity Management (BCM) Recertification Award 2011 on 28 November 2011. Certified since 2005, the award reaffirms the centre's efforts in establishing a robust framework that enables continuity management and recovery of critical business operations during a crisis.

Say No to Plastic Bags

The National Heart Centre Singapore (NHCS) has embarked on an eco-friendly initiative "Say No to Plastic Bags" at the pharmacy in January 2012. This is to reduce the use of plastic bags and patients are encouraged to bring their own carrier bags for medicines when they visit NHCS.

A poster developed by the NHCS pharmacy staff on the "Say No to Plastic Bags" initiative.

A small fee will be charged for a plastic bag with effect from June 2012. One of the worst environmental effects of plastic bags is that they are non-biodegradable. The decomposition of plastic bags takes about 1000 years! Do support us in this meaningful cause.

For feedback on Murmurs, please direct to

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