

## **BREAKTHROUGH TECHNIQUE FOR HAEMODIALYSIS PATIENTS PERFORMED AT TTSH**

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**FOR IMMEDIATE RELEASE**

### **OVERVIEW**

In July 2018, Tan Tock Seng Hospital's (TTSH) Interventional Radiology team became the first in Asia to perform the novel "Inside-Out" technique in kidney failure patients who are on haemodialysis through the central venous catheter (CVC).

Chronic vein blockage is a common complication for haemodialysis patients with CVC access. The "inside-out" technique is a minimally invasive procedure that salvages access to the blocked vein. This new technique allows for reliable and durable CVC access to the right neck vein – which is the site of choice for CVC insertion as it is associated with a lower risk of infection and lower patient morbidity/mortality. It therefore means a better prognosis for kidney failure patients who are dependent on CVC for haemodialysis.

### **HOW IT WORKS**

A metallic catheter is inserted through the right groin (femoral vein) and guided by real-time X-ray (fluoroscopy) to navigate from the inferior vena cava past the right atrium of the heart into the site of central vein occlusion. Under X-ray guidance, a safe path is created using a sharp needle wire to pierce the site of the vein occlusion from "inside" the body "out" of the neck (hence the "inside-out" technique). This wire is then pulled from outside of the body and the path of the wire is used as a new track to insert a dialysis catheter. This novel technique allows a safe and fast way to salvage blocked neck veins in dialysis patients. This procedure is performed with local anaesthesia and takes about 45 minutes.

### **MEETING A CLINICAL NEED**

Singapore ranks fourth globally for the prevalence of kidney failure – a new patient is diagnosed with the condition every five hours<sup>1</sup>. Also known as end-stage renal disease (ESRD), kidney failure is the final stage of chronic kidney disease (gradual loss of kidney function) when the kidneys have ceased to function altogether. Diabetes and hypertension are the leading causes of kidney failure. In Singapore, more than 60 per cent of kidney failure cases are due to diabetes.<sup>2</sup>

Patients with kidney failure need *renal replacement therapy* either in the form of a kidney transplant or dialysis. According to the latest available data from the Singapore Renal Registry, there are over 6,600 dialysis patients as of 2016<sup>3</sup>, and this number is expected to increase with the ageing of the population and rising incidence of chronic disease.

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<sup>1</sup> National Kidney Foundation Singapore: <https://www.nkfs.org/kidney-disease/leading-causes-of-kidney-failure/causes-symptoms-and-treatment/>

<sup>2</sup> Singapore Renal Registry Annual Report 2016: [https://www.nrdo.gov.sg/docs/librariesprovider3/default-document-library/singapore-renal-registry-annual-report-2016\\_1999-till-2016\\_v5\\_online\\_final.pdf?sfvrsn=0](https://www.nrdo.gov.sg/docs/librariesprovider3/default-document-library/singapore-renal-registry-annual-report-2016_1999-till-2016_v5_online_final.pdf?sfvrsn=0)

<sup>3</sup> Ibid.

Dialysis involves the artificial removal of waste products and excess water from blood i.e. it “replaces” the excretory function normally performed by the kidneys. There are two types of dialysis: *haemodialysis* and *peritoneal dialysis*. Haemodialysis is the more common form of dialysis – about nine in 10 dialysis patients in Singapore are on this method. It involves using a dialysis machine and a special filter known as a dialyser (an “artificial kidney”) to clean your blood externally before returning the “cleaned” blood into your body. To get your blood into the dialyser for the filtering process, an entrance, or *access*, into your blood vessel is created.

An access can be (in decreasing order of preference):

- A fistula (an access made by joining an artery and a vein in your arm)
- A graft (an access made by using a soft tube to join an artery and vein in your arm)
- A central venous catheter (CVC) (a soft tube placed in a large vein usually in the right side of your neck)

A CVC is usually an interim measure for haemodialysis patients while they wait for surgery for a fistula or graft. However, in about 20 per cent of haemodialysis patients, access through CVC is for the long term, and studies show that up to 40 per cent of haemodialysis patients with a CVC develop an obstruction i.e. the vein becomes blocked.

The most ideal site for CVC insertion is the vein in the right side of the neck. TTSH inserts more than 400 CVCs for haemodialysis per year; one in five is not in this preferred site. When the right neck vein is blocked (usually because of previous indwelling catheters), the CVC will have to be inserted in an alternate site such as the groin. Groin CVCs are less ideal, not only due to the inconvenient location, but also because they are more prone to catheter-related issues such as catheter blockage or infection, requiring frequent replacement procedures and hospitalisation. This new technique has the potential to improve the quality of life for CVC-dependent haemodialysis patients by salvaging an exhausted but preferred access site and reducing catheter dysfunction-related hospital visits for kidney failure patients on haemodialysis.

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### **About Tan Tock Seng Hospital**

TTSH is one of Singapore's largest multi-disciplinary hospitals with more than 170 years of pioneering medical care and development.

The Hospital has 43 clinical disciplines and three institutes that are spearheading care, research and innovations in geriatric medicine, infectious diseases and ophthalmology. Powered by 9,000 healthcare staff, TTSH sees over 2,700 patients at its specialist clinics and some 450 patients at its emergency department every day. TTSH is part of the National Healthcare Group, providing holistic and integrated patient care.

With a strong quality culture steeped in patient safety, TTSH constantly challenges itself to provide faster, better, cheaper and safer care for patients. To achieve this, the Hospital keeps abreast and believes in investing in its staff, facilities, medical technology and system improvements.

### **About National Healthcare Group**

The National Healthcare Group (NHG) is a leader in public healthcare in Singapore, recognised at home and abroad for the quality of its medical expertise and facilities. Care is provided through an integrated network of six primary care polyclinics, acute care and tertiary hospitals, national specialty centres and business divisions. Together they bring a rich legacy of medical expertise to our philosophy of integrated patient-centred care.

NHG's vision is "Adding Years of Healthy Life". This vision goes beyond merely healing the sick to the more difficult and infinitely more rewarding task of preventing illness and preserving health and quality of life. With some 18,000 staff, NHG aims to provide care that is patient-centric, accessible, seamless, comprehensive, appropriate and cost-effective.

As the Regional Health System (RHS) for Central Singapore, it is vital for NHG to partner and collaborate with stakeholders, community advisors, and voluntary welfare organisations. Together with our patients, their families and caregivers, we aim to deliver integrated healthcare services and programmes that help in Adding Years of Healthy Life to all concerned.

More information is available at [www.nhg.com.sg](http://www.nhg.com.sg).

### **Mandarin Glossary**

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Central venous catheter	中央静脉导管
Fistula	瘻