

SingHealth

TRANSPLANT MATTERS

Issue 17
(Oct - Dec 2020)



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Stenosis Recognition and
Management



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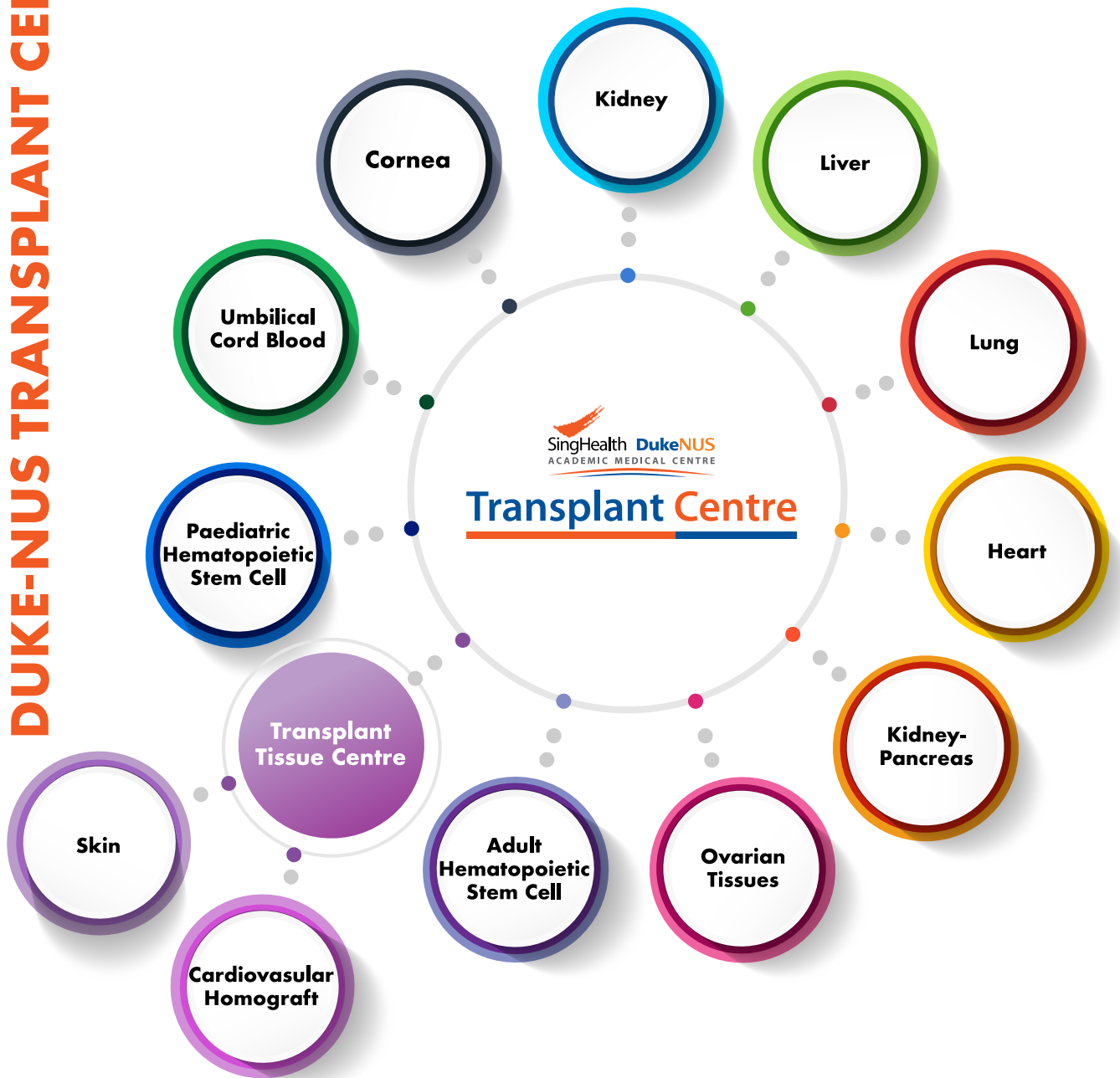
Transplantation in
COVID-19 climate



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INTRODUCTION TO SINGHEALTH DUKE-NUS TRANSPLANT CENTRE

SingHealth Duke-NUS Transplant Centre is an umbrella of 12 transplant programmes made up of robust multidisciplinary teams in the transplant service. The Transplant Centre drives improvements in the pillars of education, research and clinical services through collaboration and advocacy.



“

Director's Note




It has been more than a year since the SingHealth Duke-NUS Transplant Centre (SD Transplant Centre) was formed. The need for collaborative action has never been more vital than in the COVID pandemic. Coordinated and decisive plans enabled Singapore to tend to the ill and contain the virus. At the SD Transplant Centre, we formalised new protocols and kept our patients informed to assure them of their safety and health. I cannot be more proud of what the team has achieved! Through this newsletter, we hope to share more about the donation (organ and tissue) and transplantation research work and initiatives taking place at SingHealth. I hope you find the information in our newsletter series useful to your practice. Thank you and stay safe!


*A/Prof Prema Raj
Head, SingHealth Duke-NUS Transplant Centre*

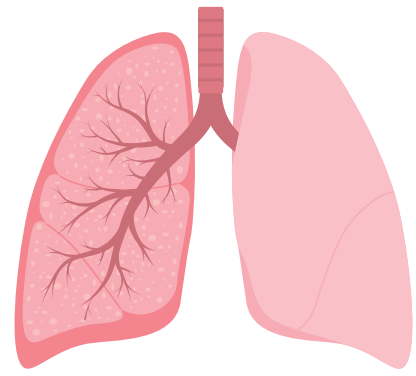
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WHO NEEDS A LUNG TRANSPLANT AND WHEN?

A lung transplant is a surgical procedure to remove and replace a diseased lung with a healthy human lung from a donor, giving recipients a new lease of life. In rare cases, part of a lung can be taken from a living person for lung transplantation.

 In Singapore, donation of lungs from deceased donors are regulated by the Medical (Therapy, Education and Research) Act (MTERA).

 Established in 2000 in the National Heart Centre Singapore (NHCS) and is the only healthcare institution in Singapore that provides this service.



16 Number of lung transplants performed in Singapore since 2000

What happens during a lung transplant?

Potential candidates are extensively tested to ensure other major organs will function properly following the transplant. Once determined to be suitable, patients will be placed on a waiting list until a compatible donor is found. Waiting time is highly variable due to the scarcity of suitable donors.

A lung transplant procedure ordinarily takes 4 to 12 hours depending on the complexity of the operation. An incision is made in the chest and removing the damaged lung, the donated lungs will then be connected to the appropriate airways and blood vessels. After which, the chest will be closed. Special measures will have to be taken to manage complications such as bleeding, primary graft failure, infection, and acute or chronic rejection. Full recovery from the operation may take up to three months.



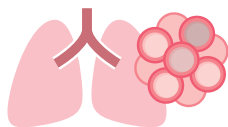
Asst Prof Sewa Duu Wen
Medical Director Lung Transplant



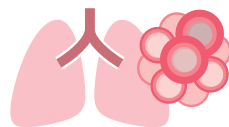
Clin Asst Prof Ong Boon Hean
Surgical Director Lung Transplant

Who needs a lung transplant?

A lung transplant will often be recommended if a person has advanced lung disease that is unresponsive to other treatments and/or when a person's life expectancy is likely less than 2-3 years. Common causes of end-stage lung diseases in Singapore include:



Chronic Obstructive Pulmonary Disease (COPD)



Interstitial Lung Disease (eg. Idiopathic Pulmonary Fibrosis)

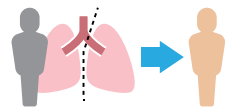


Bronchiectasis

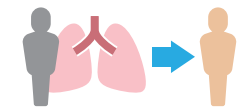


Pulmonary Hypertension (primary and secondary)

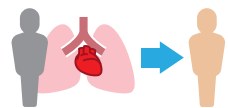
Types of Lung Transplant



Cadaveric single lung
One lung from a deceased donor is implanted into a single recipient



Cadaveric bilateral lung
Both lungs from a deceased donor are implanted into a single recipient



Cadaveric heart and lung
Heart and both lungs from a deceased donor is implanted into a single recipient, reserved for recipients who are suffering from end-stage lung and heart disease that cannot be treated with lung transplantation alone



Living donor lobar lung
One lobe from two separate living donors is implanted into a single recipient, reserved for recipients who are children or small sized adults

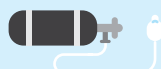
What are the benefits of a lung transplant?

The outlook for people who have undergone a successful lung transplant is continuous improvement. After the lung transplantation, these patients are able to return to their normal lives, without many of the previous restrictions.

Improved quality of life



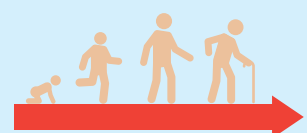
Able to live, travel and work without breathlessness



No need for long-term oxygen therapy



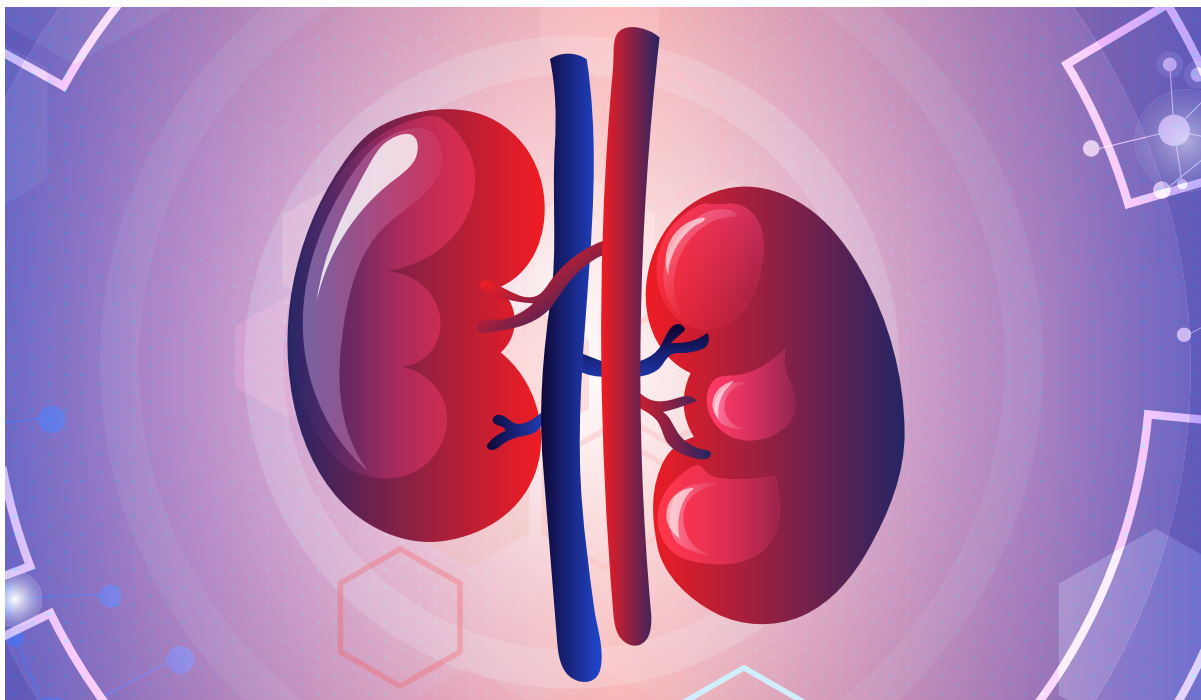
Less frequent admissions to hospital due to underlying lung disease



Longer life expectancy

The one-year survival rate post-transplantation is 80% to 90%, and the five-year survival rate post-transplant is over 50%.

RECOGNISING AND MANAGING TRANSPLANT RENAL ARTERY STENOSIS



Transplant Renal Artery Stenosis (TRAS) is a common complication after kidney transplantation and a major cause for both renal allograft dysfunction and failure. Early recognition and prompt treatment can prolong normal function of the recipient graft and allow for better management of other clinical symptoms. TRAS can be diagnosed with radiological findings and clinical presentations. Different radiological imaging methods yield results of varying accuracy, as presented in the comparison table below.

Investigations	Pros	Cons
Doppler scan	87% to 94% sensitivity. 86% to 100% specificity.	Technically demanding and operator reliant.
Isotope renogram	75% sensitivity.	67% specificity (low).
Computed tomography angiography	Precise imaging with 3D detail.	Radioactivity and contrast use.
Magnetic resonance angiography	Precise imaging with 3D detail. 67% to 100% sensitivity. 75% to 100% specificity. No contrast use and no radioactivity.	Gadolinium use, difficult in claustrophobic patients and expensive.



Poster by:

Dr Kamaraj Kanagasabapathy
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Table 1: TRAS – Comparison of non-invasive investigations

Findings from the different investigation and treatment options

Despite high-quality imaging, computed tomography angiography is not recognised as the gold standard due to the intravenous contrast that poses a risk of decline in graft function. Instead, Digital Subtraction Angiography (DSA) with or without 3D imaging using carbon dioxide as negative contrast was able to provide optimal identification of TRAS. Majority of TRAS cases are present with persistent refractory blood pressure, allograft dysfunction or both, in the absence of graft comorbidities. Percutaneous transluminal angioplasty with stenting lowers the relapse rate to less than 10 per cent in patients who experience graft dysfunction and difficulty in controlling blood pressure with the progression of stenosis. It is advisable to perform an open revision of the transplanted kidneys if TRAS occurs during the early post-operative period.



◀ Scan QR code to view the poster and more research publications.



INTESTINAL TRANSPLANT IN A PORCINE MODEL

In recent decades, intestinal transplantation has emerged as an established treatment option for the management of irreversible intestinal failure and has been successfully performed on both children and adults suffering from a variety of intestinal-related pathologies including short bowel syndrome and extensive portomesenteric venous thrombosis. Given the therapeutic benefits that intestinal transplants can potentially confer to patients with intestinal failure, we performed a proof-of concept experiment using live porcine models.



Our study protocol involved donor and recipient sibling pigs of approximately 30kg each. Donor procurement begins with a long midline laparotomy with mobilisation of the colon, small bowel, duodenum, liver and pancreas. The vena cava, thoracic aorta and distal abdominal aorta are similarly mobilised, slung and cannulated for the administration of cold HTK perfusate prior to explantation and back table preparation. The recipient is similarly prepared for removal of its native organs and is placed on veno-veno bypass. The multivisceral graft is then brought to the recipient where caval and aortic anastomoses are performed followed by graft reperfusion. Intestinal continuity is achieved via means of gastrojejunostomy and ileocolostomy and the abdomen is closed. At present, technical success was achieved in all pigs, although none survived beyond 24 hours. Given that the study is still in its infancy, our team is working tirelessly to improve the technical and immunological aspects to ensure survivability in subsequent porcine experiments.

What is intestinal failure?

Intestinal failure occurs when the intestine cannot digest and/or absorb the calories and nutrients needed for day-to-day life.

Conditions that can lead to intestinal failure include:

1. Short gut syndrome – most of the intestine has been surgically removed because of poor circulation, infection, trauma, tumor or disease.
2. Poor digestion or absorption – the entire intestine is present but is unable to digest or absorb fluids and nutrients properly
3. Poor motility – the intestine is unable to contract its muscles normally and food is unable to move through the intestinal tract.

Patients with intestinal failure require parenteral nutrition (TPN) to avoid starvation and some may develop complications due to their condition and from the use of TPN. These complications include liver disease, blood infection, imbalance in blood electrolytes and poor quality of life.



Principal Investigator:

Dr Koh Ye Xin

Consultant

Hepato-pancreato-biliary and Transplant Surgery
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Acknowledgements

This study was conducted in collaboration with members from the Department of Hepatopancreatobiliary and Transplant Surgery and colleagues from the Department of Anaesthesia at SGH. We would also like to extend our gratitude to staff from the Nursing division, veterinarian and administrative staff at SingHealth Experimental Centre (SEMC) and SD Transplant Centre. This study was supported by the John 3:16 Fund.

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This webinar series hosted virtually on Zoom, brings together the transplant community in the region to engage meaningfully and drive continuous learning even during the COVID-19 pandemic. In collaboration with the International Collaboration Office (ICO), the SD Transplant Centre invited overseas partners to share their clinical expertise and experience alongside our local clinicians and also publicised these webinars to garner regional audiences. With tight boarder controls in place to curb the spread of COVID-19, the need for healthcare professionals to continue their efforts to learn from one another is especially crucial. Sharing knowledge and experiences across countries in the region help medical teams cope with the circumstances the virus has brought upon their patients and practice.



Prof Khin Maung Win



Dr Ramesh Bhandari

26 August – Liver Transplantation

This webinar provided insights into delivering liver transplantation services during the COVID-19 pandemic. Together with our local speakers, our regional partners such as Dr Ramesh Bhandari, Professor and Unit Chief, GI HPB and Liver Transplant, Tribhuvan University Teaching Hospital, Nepal and Prof Khin Maung Win, Head of Department of Hepatology, Yangon GI & Liver Centre, Myanmar were invited to share their experience. They presented on donor hepatectomy complications and management of hepatocellular carcinoma in Myanmar respectively.



Dr Lallindra Gooneratne

2 September – Hematopoietic Stem Cell Transplantation (HSCT)

This webinar focused on haematopoietic stem cell transplantation and managing transplant services during the COVID-19 pandemic. Local speakers tied up with a regional centre from Colombo, Dr Lallindra Gooneratne (Director of Clinical Haematology and Bone Marrow Transplantation at Asiri Central Hospital, Colombo), from Sri Lanka was invited to present on management of common early HSCT complications alongside local clinicians.

TRANSPLANTATION IN COVID-19 CLIMATE



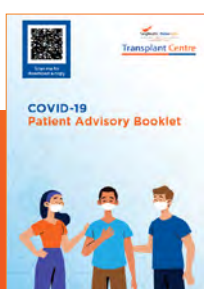
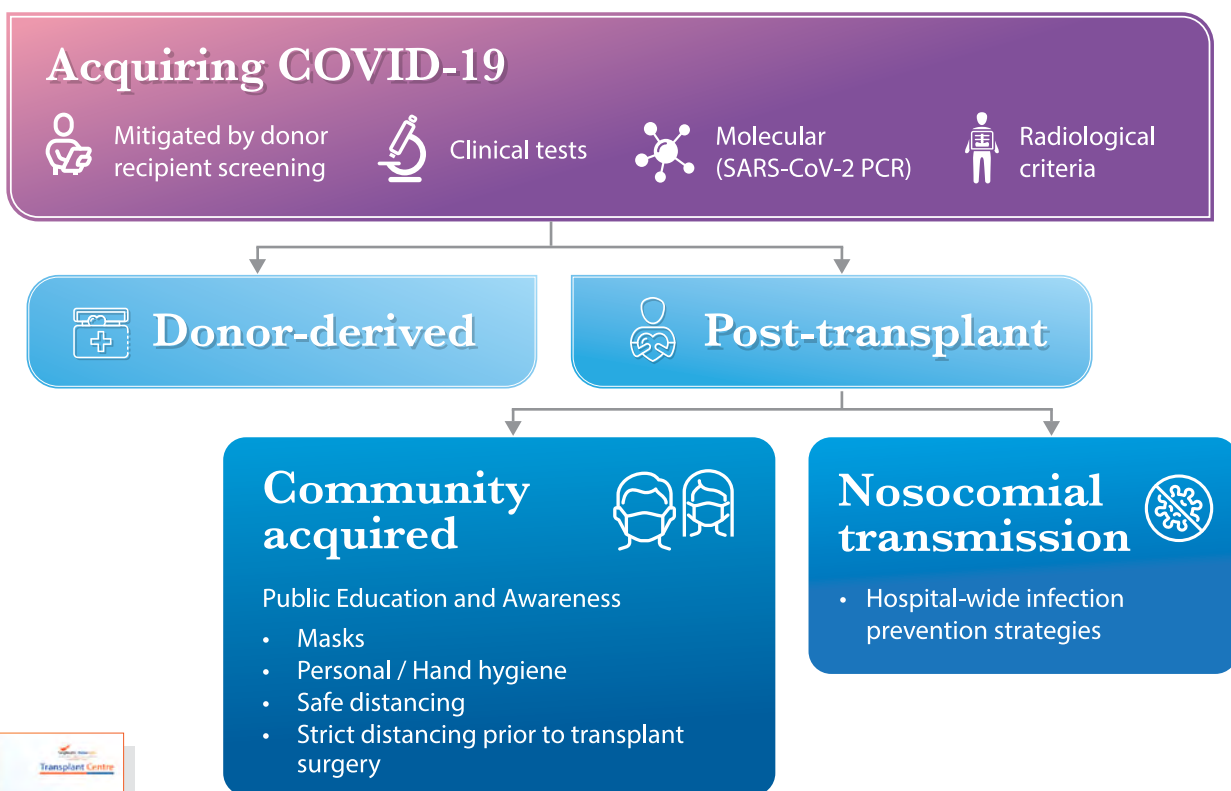
Article written by:
Dr Jasmine Chung
 Consultant
 Infectious Diseases
 Singapore General
 Hospital

The current COVID-19 pandemic has not only caused global social disruptions but has also put tremendous strain on healthcare systems worldwide. With all attention and significant effort diverted to containing and managing the COVID-19 outbreak (and understandably so), essential medical services such as transplant services had been affected as evidenced by the decrease in transplant volumes internationally. As the number of COVID-19 infections surged across the world, the restriction of transplant activities was inevitable. The outbreak had caused a strain on healthcare resources and posed a risk to patient safety, whether it is the risk of donor-derived COVID-19 infections or introducing immunosuppression into patients in the midst of a pandemic. Based on available data and mathematical modelling, it is now clear that this pandemic is expected to be long-drawn. The risk of acquiring COVID-19 for transplant patients is depicted in the diagram below alongside the mitigating measures.

As a group, the SingHealth Duke-NUS Transplant Centre (SDTC) has adopted a tiered approach based on disease outbreak alerts with stringent selection criteria for donor and recipients alike to ensure that life-saving transplants can proceed safely. The decision for proceeding with a transplant will also be guided by its indication based on medical acuity, availability of manpower and healthcare resources, and overall safety of all parties involved. All donors and recipients will be actively screened to exclude COVID-19 prior to proceeding. This involves thorough history-taking to screen for epidemiologic risks, as well as performing nucleic acid amplification tests and radiological imaging. In addition, robust infection prevention processes are in place in our hospitals to further reduce the risk of contracting COVID-19.

Moving forward, the main challenge is the prevention of COVID-19 in the community. In the absence of effective vaccines, prophylaxis or treatment strategies, the precautionary measures of social distancing, application of face masks, hand hygiene and good sanitation are crucial. The integration of tele-commuting services and or careful coordination of post-transplant reviews in the outpatient clinic are additional measures we adopt. It takes a multi-disciplinary team to walk our patients through the transplant journey, more so during a pandemic; and our team at SD Transplant Centre is committed to this.

Life-saving transplants cannot be deferred indefinitely as the patient's disease may progress, forcing them to drop off the waiting list or they may succumb to their disease.



COVID-19 Patient Advisory Booklet containing information on how transplant patients and their loved ones can stay safe. Download a copy by scanning the QR code!

UPCOMING EVENTS

ZOOM WEBINAR



Ethics & Transplantation with Adj. Prof Christy Simpson



9 Dec



11.30am - 12.30pm

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ACKNOWLEDGEMENTS

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