JAN-MAR 19

singhealth.com.sg

MEDICAL NEWS

A SingHealth Newsletter for Medical Practitioners MCI (P) 117/11/2018

FOCUS: LIVER

SingHealth Duke-NUS Academic Medical Centre

• Singapore General Hospital • Changi General Hospital • Sengkang General Hospital • KK Women's and Children's Hospital • National Cancer Centre Singapore • National Dental Centre Singapore • National Heart Centre Singapore • National Neuroscience Institute • Singapore National Eye Centre • SingHealth Community Hospitals • SingHealth Polyclinics

Appointments: 6321 4402
Email: appointments@sgh.com.sg

An Update on Liver Transplant – ABO Incompatible Grafts

Professor Chung Yaw Fui Alexander, Senior Consultant,
Department of Hepato-pancreato-biliary and Transplant Surgery, Singapore General Hospital

THE INDICATIONS/NEED

Liver transplant is the treatment of choice for end-stage liver disease from cirrhosis, fulminant liver failure and non-metastatic, low tumour burden Hepatocellular Carcinoma (HCC). In Singapore, whilst Hepatitis B infection is on the decline with compulsory vaccination at birth, an emerging cause of chronic liver disease is steatohepatitis/fatty liver. Chronic liver disease in the form of cirrhosis is the catalyst for the formation of HCC *(Refer to Figure 1)*.

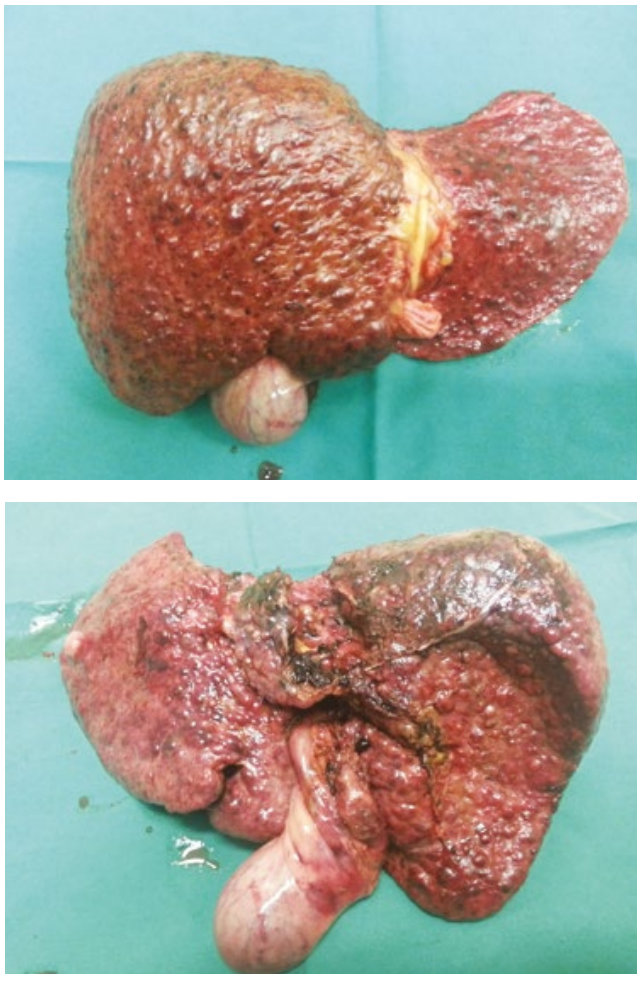


Figure 1 Total hepatectomy specimen showing macro-nodular cirrhosis with HCC in the left lobe

Last year, in 2017, the SingHealth Duke-NUS Liver Transplant Centre (SDDC-Liver Transplant) performed a total of 21 liver transplants, of which more than half was for HCC.

Despite the enacted HOTA for optimisation of the donor pool, actualised donor procurement is low. The small family unit with falling fertility rate does not help either in expanding the living donor pool. Till recently, most centres have used ABO compatible (ABOc) grafts, especially so in Deceased Donor Liver Transplant (DDLT), because of the risk of rejection and short preparation time.

To overcome the growing need for liver grafts and expanding indication for HCC treatment, SDDC initiated and performed Singapore's first ABO incompatible (ABOi) Living Donor Liver Transplant (LDLT) with collaboration from various institutions.

CASE ANALYSIS

Our patient is Mr. Chen, 55-year old, with Child-Pugh B9 Hepatitis B and ethanol induced cirrhosis, complicated by HCC in the left lobe. He had prior ascites secondary to portal hypertension and spontaneous bacterial peritonitis.

A liver transplant is the treatment of choice to replace the malfunctioning liver and eradicate the hepatitis B-related tumour. His blood group is B+ while his son who came forward as the living donor is A+. Mr. Chen's blood plasma has anti-A antibodies which will cause reaction to the antigen A in the graft, leading to disseminated intravascular coagulation and graft death. This is the most severe form of Antibody Mediated Rejection (AMR) and will certainly result in death if there is no re-transplant. The chronic progressive form is diffuse intrahepatic biliary strictures, which also warrants re-transplant.

In order to prevent rejection of the planned right lobe graft from his son, rituximab, a specific immunosuppressive drug to deplete the B cells in Mr. Chen's plasma as well as weaken their function in producing antibody, was administered 3 weeks prior to transplant.

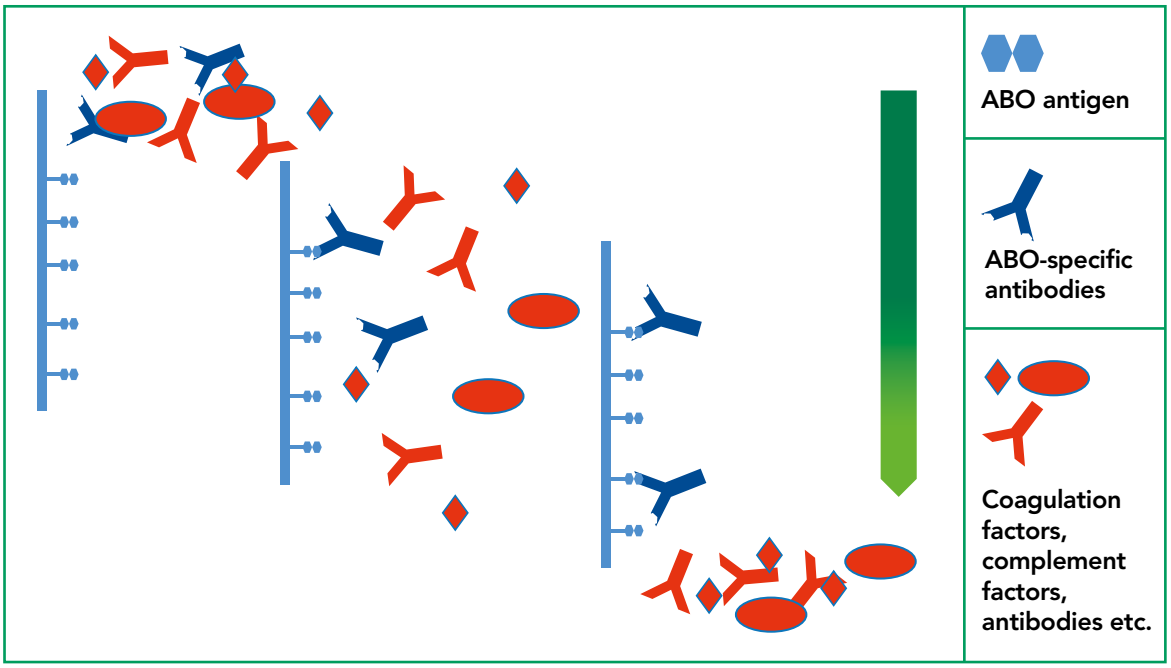


Figure 2 Apheresis columns specifically removes ABO antibodies

It was also necessary to cleanse the blood of antibodies to the graft's antigen A using columns of adsorption filters to very low titres. These levels were monitored daily pre and post-surgery with further apheresis when required *(Refer to Figure 2)*.

The column was coupled into haemodialysis machine to draw blood using vascular catheter inserted just prior. The apheresis took an average of 4-6 hours with minimal discomfort.

The routine immunosuppression for ABOc transplant of triple drug, i.e. steroids, mycophenolate mofetil, and tacrolimus was used. Basiliximab was used in the event tacrolimus cannot be started on time (the schematic timeline diagram depicts our ABOi protocol) *(Refer to Figure 3)*.

Once the liver function test returns to normal, accommodation has occurred and further apheresis is not necessary. Accommodation is the tolerance of the host towards the graft in the background of returning/normalised antibody titres, usually in a month's time.

Mr. Chen recovered with an episode of acute cellular rejection requiring pulse steroids. He is 1 year and 3 months post-transplant and has welcomed the birth of his grandchild from his donor son and wife.

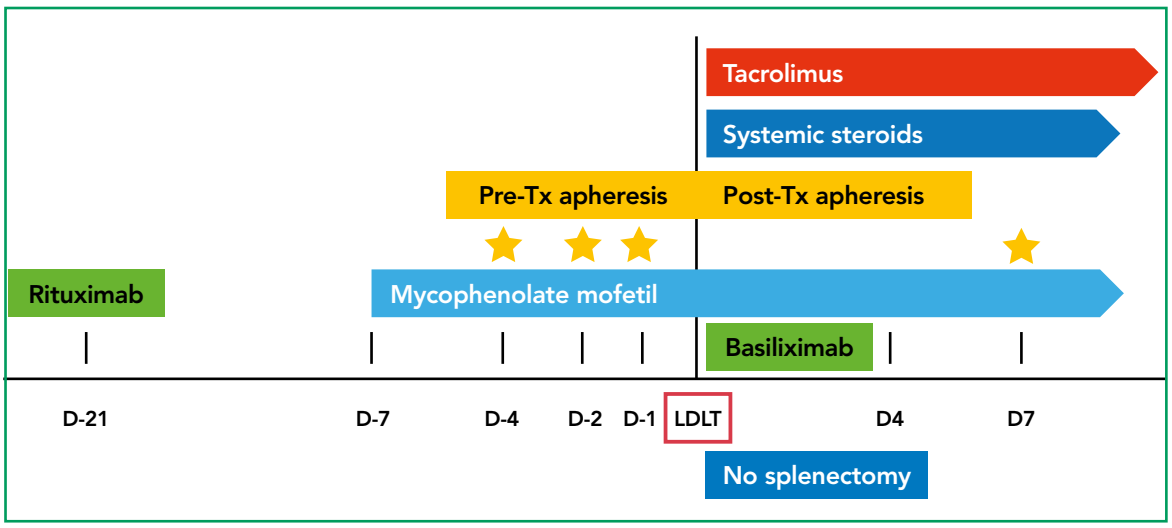


Figure 3 Schema of the protocol of immunosuppression and apheresis performed

FUTURE

ABOi grafts have been routinely used as enhancement to programmes around the world to increase the donor pool. They have comparable survival results with ABOc. The desensitisation procedure has been well established and proven safe, with increasing ABOi transplant of up to 15% in high volume centres and a reported 7% complications related to the antibody related reactions.

ABOi liver transplant is possible in Singapore and can be a curative treatment for HCC. The fear of AMR can be overcome with a regimen of immunosuppression and apheresis balanced against the risk of infection.

ACKNOWLEDGEMENTS

SDDC-Liver Transplant is fortunate to work with nurses in the various wards/intensive care units and team from Department of Haematology, Renal Medicine, Renal Dialysis Centre and Blood Support Group of Health Sciences Authority of Singapore.

The SDDC-Liver Transplant team that meets every Tuesday afternoon to review clinical cases presented by primary doctors comprising of surgeon, hepatologist/physician and medical oncologist from Centre for Digestive and Liver Diseases, Singapore General Hospital and National Cancer Centre Singapore, Changi General Hospital, KK Women's and Children's Hospital, and Sengkang General Hospital. Liver Transplant Coordinators are available to coordinate the presentation of cases with inputs from anaesthetist, radiologist, nurses and allied health staff.

REFERENCE

1. ABOi adult LDLT under the desensitisation protocol with rituximab. Song GW, et al. Am J Transplant 2016

Professor Chung Yaw Fui Alexander is a Senior Consultant at the Department of Hepato-pancreato-biliary and Transplant Surgery at the Singapore General Hospital.

He has a specialist accreditation in General Surgery and is a Senior Lecturer at the NUS Yong Loo Lin School of Medicine.

GPs can call for appointments through the GP Appointment Hotline at **6321 4402** or scan the QR code for more information.

Current Treatment Options for Hepatocellular Carcinoma and The Role of Liver Transplantation

Professor Brian K. P. Goh,
Deputy Head, SingHealth Duke-NUS Liver Transplant Centre,
Senior Consultant, Department of Hepato-pancreato-biliary and Transplant Surgery,
Singapore General Hospital

Introduction

Hepatocellular Carcinoma (HCC) or primary liver cancer is highly prevalent in many Asian countries especially in China and Southeast Asia.[1] Globally, it is the 6th most common cancer and it has become the 2nd most common cause of cancer-related mortality. In Singapore, liver cancer was reported to be the 3rd most common cause of cancer deaths in males and 4th most in females according to the 2015 Singapore Cancer Registry annual report.[2]

Chronic hepatitis B infection is currently the predominant risk factor for HCC in Southeast Asia, including Singapore. However, the incidence of hepatitis B infection is now declining in our country with the introduction of routine screening and immunisation. Nonetheless, with the increasing prevalence of diabetes and obesity in Singapore which is associated with Non-Alcoholic Fatty Liver Disease (NAFLD), the incidence of HCC is not expected to decline but conversely may instead increase as seen in North America, whereby HCC is now the fastest rising cause of cancer deaths.[3]

STAGING AND PROGNOSTICATION OF HCC

HCC is a complex heterogenous cancer. The prognosis of HCC not only depends on the extent of the cancer but also on the severity of the underlying chronic liver disease which frequently also influences the choice of treatment.

Hence, unlike most cancers which can be accurately staged/prognosticated solely according to the extent of the cancer with the widely-used American Joint Committee on Cancer/International Union Against Cancer tumour-lymph node-metastasis (TNM) staging system[4], prognostication systems for HCC such as the Barcelona Clinic Liver Cancer (BCLC) system usually incorporate both parameters which not only determine the extent of the cancer but also the severity of liver disease.[5]

The BCLC staging system has been endorsed by both the American Association for the Study of Liver Diseases (AASLD) and European Association for the Study of the Liver (EASL) to guide treatment of HCC and has been widely adopted in the West but not in Asia.[1]

TREATMENT OPTIONS FOR HCC

The treatment of HCC can be simplified into curative and non-curative treatment options.[6] Curative options for HCC provide a high-chance for durable long-term survival and include partial liver resection (LR)/hepatectomy, local ablation and liver transplantation (LT).

When patients are not suitable for curative treatment due to disease extent, diminished liver function or poor fitness; non-curative options which can prolong life such as transarterial chemoembolisation (TACE), selective internal radiation therapy (SIRT) with yittrium-90 and systemic therapy are commonly administered. These "non-curative" treatment options are also occasionally used as neoadjuvant treatment to downstage patients for curative therapy.[7]

Appointments: 6321 4402
Email: appointments@sgh.com.sg

Partial liver resection

LR remains the most widely-used first-line treatment modality for HCC in Asia especially for solitary primary HCC in patients with a well-preserved liver function.[8, 9] This usually provides patients with 5-year survival outcomes of between 60-70%. [3, 9]

In Asia, LR is also frequently used for recurrent HCC, multifocal HCC and patients with borderline liver function.[1,10-12] Although, LT would be the optimal treatment for many of these patients, the severe shortage of organs particularly in Asia have resulted in the more aggressive use of LR.[1,10,11] Although, LR was considered a high-risk surgical procedure with significant mortality especially for HCC two decades ago, rapid improvement in perioperative care and surgical technique have resulted in a decrease in 90-day postoperative mortality rates to less than 5%, especially in Asia.[9-11]

More recently, minimally-invasive surgery (robotic/laparoscopic)[13-15] has increasingly been adopted for LR especially in high-volume tertiary-care specialised centres resulting in improved perioperative outcomes such as lower morbidity and shorter hospital stay without compromising oncological outcomes.

Liver transplantation

LT frequently offers the most durable and effective long-term survival for most patients with HCC.[16] It is undoubtedly the curative treatment of choice for suitable patients with recurrent HCC, multifocal HCC and patients with a compromised liver function or decompensated liver disease.[16,17]

LT offers the advantage of "killing 2 birds with one stone" as not only does it remove the offending malignancy but it also replaces the underlying damaged liver which acts as a "soil" for new recurrent cancers. The main obstacle of LT for HCC in Asia including Singapore is the severe shortage of both deceased and living donor organs resulting in many patients receiving "alternative" treatment options.[18]

Presently, the Milan criteria and the University of California San Francisco (UCSF) criteria (used in Singapore) are the 2 most widely-used criteria for selecting patients with HCC for deceased donor (DD) LT *(Refer to Figure 1)*.[19]

Figure 1 Commonly used criteria for deceased donor liver transplant for HCC

Criteria	Description
Milan, 1996	1 lesion ≤ 5 cm or 3 lesions ≤ 3 cm each Without vascular or extrahepatic invasion
UCSF, 2001	1 lesion ≤ 6.5 cm or 2-3 lesions ≤ 4.5 cm each, with a total tumour diameter ≤ 8 cm Without vascular or extrahepatic invasion

These 2 stringent criteria are used to select the best HCC patients for LT as they have been proven to be the most robust criteria to give rise to 5-year survival rates of about 80% which is comparable to that of LT for benign disease. It is important to bear in mind that due to the limited deceased donor organ supply which are "shared" between patients with HCC and those with benign disease; ethically, the survival after LT for both groups must be comparable for the optimal use of deceased donor grafts.

Presently, many major transplant centres throughout the world including our centre use a more liberal expanded criteria for living donor (LD) LT. This is because although LT in these patients may not give rise to the same survival outcomes as for those within the Milan or UCSF criteria[20], LT still frequently offers by far the best chance of cure or long-term survival compared to palliative treatment options such as TACE, SIRT or systemic treatment.

Hence, as the organ from a living donor is not a public resource but a personal gift from the donor to the recipient[1]; LD organs are not ethically subjected to the same stringent requirements as that for DD organs.

Other treatment options

Percutaneous local ablation is a commonly utilised less-invasive treatment modality for the treatment of HCC.[1,6] It is considered potentially curative for small (< 3 cm) solitary HCC and is frequently used as an alternative treatment option to LR or LT.

Its main advantage is its decreased morbidity compared to LR and LT but it is associated with a higher local recurrence rate. Local ablation is especially useful for solitary tumours which are deep-seated in the liver requiring extensive liver resection, especially in patients whom are less fit for major surgery. Presently, the 2 most common ablation modalities used in Singapore are radiofrequency ablation and microwave ablation.

Locoregional treatment either via TACE or SIRT are frequently used as non-curative treatment options for HCC within the liver which is not amenable to curative treatment.

TACE is most commonly indicated for multifocal HCC limited to the liver and has been proven to prolong survival in these patients.[21]

SIRT with Y90 is a newer treatment modality which is similarly commonly used for multifocal HCC limited to the liver.[22] It is especially useful for patients who have previously been treated via TACE, large tumours or HCC associated with portal vein tumour thrombus.[1,22]

External-beam radiation therapy has now also been recognised and has been included in several guidelines as a treatment option for advanced HCC.[6]

Although locoregional treatment is most commonly used as non-curative treatment for advanced HCC, it may also occasionally be used for downstaging of HCC prior to PLR or LT.[7,16]

Systemic treatment is usually indicated in patients with advanced HCC with extrahepatic disease. Globally, sorafenib is widely accepted as the standard of care for the first-line treatment of advanced HCC which is not amenable to locoregional treatment.[23] More recently, regorafenib[24] and nivolumab[25] have been approved by the FDA as 2nd line treatment for HCC patients following prior sorafenib.

CONCLUSION

HCC is a complex cancer whereby its prognosis and treatment is not only determined by the extent of disease but also frequently by the severity of underlying liver disease. LR, LT and local ablation are curative-treatment options for HCC. Although, LT frequently provides the optimal and most durable cure for selected patients with HCC, its use is severely limited by a severe shortage in donor organs.

REFERENCES

1. Choo SP, Tan WL, Goh BK, Tai WM, Zhu AX. Comparison of hepatocellular carcinoma in Eastern vs Western populations. Cancer 2016;122:3430-46.
2. Singapore Cancer Registry Annual Registry report 2015.
3. El Serag HR. Hepatocellular carcinoma. N Engl J Med 2011;365:1118-1127.
4. Amin MB, Edge S, Greene F, et al. AJCC cancer staging manual 8th edition.
5. Llovet JM, Bru C, Bruix J. Prognosis of hepatocellular carcinoma: the BCLC staging classification. Semin Liver Dis 1999;19:329-38.
6. Chow PK, Choo SP, Ng DE, Lo RH, Wang ML, Toh HC, Tai DM, Goh BK, Wong JS, Tay KH, Goh AS, Yan SX, Loke KS, Tang SP, Gogna A, Too CW, Irani FG, Leong S, Lim KH, Thng CH. National Cancer Centre Singapore consensus guidelines for hepatocellular carcinoma. Liver Cancer 2016;5:97-106.
7. Teo JY, Allen JC, Ng DC, Choo SP, Tai DM, Chang JP, Cheah FK, Chow PK, Goh BK. A systematic review of contralateral liver lobe hypertrophy after unilobar selective internal radiation therapy with Y90. HPB 2016;18:7-12.
8. Koh YX, Tan HL, Lye WK, Kam JH, Chiow AK, Tan SS, Choo SP, Chung AY, Goh BK. Systematic review of the outcomes of surgical resection for intermediate and advanced Barcelona Clinic Liver Cancer stage hepatocellular carcinoma: a critical appraisal of the evidence. World J Hepatol 2018;10:433-47.
9. Goh BK, Teo JY, Chan CY, Lee SY, Jeyaraj P, Cheow PC, Chow PK, Ooi LL, Chung AY. Importance of tumour size as a prognostic factor for solitary hepatocellular carcinoma: implications on the current AJCC stagin system. J Surg Oncol 2016;113:89-93.
10. Goh BK, Kam JH, Lee SY, Chan CY, Allen JC, Jeyaraj P, Cheow PC, Chow PK, Ooi LL, Chung AY. Significance of neutrophil-to-lymphocyte ratio, platelet-to-lymphocyte ratio and prognostic nutrition index as preoperative predictors of early mortality after liver resection for huge (≥10cm) hepatocellular carcinoma. J Surg Oncol 2016;113:621-7.
11. Goh BK, Chow PK, Teo JY, Wong JS, Chan CY, Cheow PC, Chung AY, Ooi LL. Number of nodules, Child-Pugh status, margin positivity, and microvascular invasion, but not tumour size, are prognostic factors of survival after liver resection for multifocal hepatocellular carcinoma. J Gastrointest Surg 2014;18:1477-85.
12. Goh BK, Syn N, Teo JY, Guo YX, Lee SY, Cheow PC, Chow PK, Ooi LL, Chung AY, Chan CY. Perioperative outcomes of laparoscopic repeat liver resection for recurrent HCC: comparison with open repeat liver resection for recurrent HCC and laparoscopic resection for primary HCC. World J Surg 2018 Oct 15 in press
13. Goh BK, Lee SY, Teo JY, Kam JH, Jeyaraj PR. Cheow PC, Chow PK, Ooi LL, Chung AY, Chan CY. Changing trends and outcomes associated with the adoption of minimally invasive hepatectomy: a contemporary single-institution experience with 400 consecutive resections. Surg Endosc 2018;32:4658-65.
14. Goh BK, Teo JY, Chan CY, Lee SY, Cheow PC, Chow PK, Ooi LL, Chung AY. Evolution of laparoscopic liver resection at Singapore General Hospital: a nine-year experience of 195 consecutive resections. Singapore Med J 2017;58:708-13.
15. Ciria R, Gomez-luque I, Ocana S, et al. Systematic review and meta-analysis comparing the short- and long-term outcomes for laparoscopic and open liver resections for hepatocellular carcinoma: updated results from the European Guidelines meeting on laparoscopic liver surgery, Southampton, UK, 2017. Ann Surg Oncol 2018 Nov 2 in press
16. Mazzaferro V, Chun YS, Poon RT, et al. Liver transplantation for hepatocellular carcinoma. Ann Surg Oncol 2008;15:1001-7.
17. Guo YX, Tan EK, Tan CK, Tan BH, Tan TT, Lee SY, Chan CY, Cheow PC, Chung AY, Jeyaraj PR, Goh BK. Outcome of salvage liver transplant for recurrent hepatocellular carcinoma: a comparison with repeat liver resection and primary liver transplant. Ann Hepatobiliary Pancreat Surg 2018 in press
18. Tan EK, Goh BK, Krishnamoorthy TL, Tan CK, Jeyaraj PR. Liver Transplant waitlist outcomes and the allocation of HCC MELD exception points at a low-volume centre. Transplant Proc 2018 in press
19. Costentin CE, Bababekov YJ, Zhu AX, Yeh H. Is it time to reconsider the Milan Criteria for selecting patients with hepatocellular carcinoma for deceased-donor liver transplantation? Hepatology 2018 Sep 19 in press
20. Mazzaferro V, Sposito C, Zhou J, et al. Metroticket 2.0 model for analysis of competing risks of death after liver transplantation for hepatocellular carcinoma. Gastroenterology 2018;154:128-39.
21. Lo CM, Ngan H, Tso WK, et al. Randomised controlled trial of transarterial lipiodol chemoembolisation for unresectable hepatocellular carcinoma. Hepatology 2002;35:1164-71.
22. Chow PK, Gandhi M, Tan SB, et al. SIRveNIB: Selective internal radiation therapy versus sorafenib in Asia-Pacific patients with hepatocellular carcinoma. J Clin Oncol 2018;36:1913-21.
23. Llovet JM, Ricci S, Mazzaferro V, et al. Sorafenib in advanced hepatocellular carcinoma. N Engl J Med 2008;359:378-390.
24. Bruix J, Qin S, Merle P, et al. Regorafenib for patients with hepatocellular carcinoma who progressed on sorafenib treatment (RESORCE): a randomised, double-blind, placebo-controlled, phase 3 trial. Lancet 2017;389:56-66.
25. El-Khoueiry AE, Sangro B, Yau T, et al. Nivolumab in patients with advanced HCC (Checkmate 040): an open-label, non-comparative, phase 1/2 dose escalation and expansion trial. Lancet 2017;389:2492-2502.

TREATING HCC AT SINGHEALTH

The SingHealth-Outram Campus treats the largest number of HCC patients in the country. The multi-disciplinary management of HCC in the campus is led by the:

- **Department of Hepato-pancreato-biliary (HPB) and Transplant Surgery**
- **Department of Gastroenterology and Hepatology at Singapore General Hospital (SGH)**
- **Division of Medical Oncology at the National Cancer Centre Singapore.**

These three departments work closely together via multidisciplinary tumour boards and are assisted by the Departments of Radiology, Interventional Radiology and Nuclear Medicine to provide optimal care to HCC patients.

All major liver surgeries at the campus are performed by the Department of HPB and Transplant Surgery at SGH, which is one of the highest volume liver surgery centres in Southeast Asia.

In 2017 alone, the department performed over 200 major liver surgeries including 21 adult liver transplants. It is also a regional leader in minimally-invasive liver resections (laparoscopic/robotic) having performed over 500 such procedures to date.

Professor Brian K. P. Goh (MBBS, MMed, MSc, FRCSEd) is certified by both the American Society of Transplant Surgeons and the Ministry of Health Singapore to perform liver, kidney and pancreas transplants. He is a highly-experienced surgeon having performed over 1000 major Hepato-pancreato-biliary and Transplant Surgeries (HPB/transplant surgeries) since becoming a board-certified surgeon.

Dr Goh has a special interest and is presently one of the leaders of minimally-invasive HPB surgery in Southeast Asia. He is also a pioneer of the application of robotic surgery for major HPB surgery in the region.

GPs can call for appointments through the GP Appointment Hotline at **6321 4402** or scan the QR code for more information.

Appointments: 6321 4402
Email: appointments@sgh.com.sg

Long-Term Management of Liver Transplant Recipients: The Primary Care Perspective

Dr Reina Lim Tee Gan, Consultant,
Department of Gastroenterology and Hepatology, Singapore General Hospital

Liver Transplantation (LT) outcomes have improved dramatically over the decades. The 1-year and 5-year survival after LT is around 85% and 70% respectively. With increasing numbers of long-term survivors, Primary Care Physicians (PCPs) are seeing larger numbers of solid organ recipients in their practice.

In addition to routine healthcare needs unrelated to the transplant, PCPs are faced with complex management of chronic illness that have unique implications due to chronic immunosuppression. This article helps to illustrate the common issues which may be encountered by PCPs and the co-management of patients after LT.

I. IMMUNOSUPPRESSANTS AFTER LIVER TRANSPLANT

Early after LT, patients are usually on a combination of two to three immunosuppressive medications, including a calcineurin inhibitor (CNI), an antimetabolite, and/or corticosteroids. Later, most centres taper doses of immunosuppressive drugs and eliminate all but the CNIs. There is considerable variation between centres as to the particular medications used and the specific timing of their tapering and discontinuation. Laboratory tests on all recipients are reviewed on a regular basis (most often monthly, but more or less frequently based on patient health, organ function and centre-specific protocols).

There are several side effects common to both CNIs including hyperkalemia, hypertension, neurotoxicity (headaches, tremors, neuropathy and seizures) and nephrotoxicity. It is also associated with diabetes. Occasionally, patients are prescribed ciclosporin which is more commonly associated with dyslipidemia and gingival hyperplasia.

Corticosteroids are generally given in large doses during the first week after LT and tapered rapidly to low levels or completely eliminated within weeks or months following LT. Given the substantial long-term side effects of corticosteroids, it is important to try to eliminate or minimise corticosteroids use in transplant recipients as soon as possible.

Drug interactions of immunosuppressants

Tacrolimus, cyclosporin and sirolimus have dose-related toxicity and relatively narrow therapeutic windows. The two pathways that are important for CNIs metabolism are cytochrome P-450 3A4 and P-glycoprotein. Certain drugs can induce or inhibit the cytochrome P-450 3A4 pathway resulting in rapid or slow metabolism of CNIs. *Tables 1 and 2* provide a list of common substances that can increase or decrease levels of immunosuppressants.

Table 1 Drugs that may reduce levels of tacrolimus, cyclosporine and sirolimus

Anti-convulsants	Antibiotics
Carbamazepine	Rifabutin
Phenobarbital	Rifampin
Phenytoin	

Others
St. John's wort
Orlistat

Table 2 Drugs that may increase levels of tacrolimus, cyclosporine and sirolimus

Anti-fungals	Antibiotics
Caspofungin	Azithromycin
Fluconazole	Clarithromycin
Itraconozole	Erythromycin
Ketoconozole	
Terginafine	
Variconozole	

Calcium channel blockers	Others
Diltiazem	Protease inhibitors for HBV and HIV
Verapamil	Grapefruit products
	Danazol

II. CHRONIC CONDITIONS DUE TO CHRONIC IMMUNOSUPPRESSION

Chronic Renal Impairment (CRF)

Renal insufficiency is a major cause of morbidity and mortality after liver transplant. As much as 25% of the decline in GFR can occur within the first post-transplant year.

Common aetiologies of renal dysfunction after liver transplantation are CNI toxicity, hypertensive vascular changes, diabetic nephropathy, membranoproliferative glomerulonephritis (MPGN) and IgA nephropathy. Signs and symptoms of patients with CRF include anaemia, renal osteodystrophy and electrolyte abnormalities.

Patients who develop CRF after liver transplantation have increased morbidity and mortality, therefore early identification and referral to a renal specialist is essential.

Diabetes

The prevalence of overt diabetes in LT patients may be as high as 33%. Incidence of *de novo* post-transplant diabetes is greatest during the first year after LT.

Management of post-transplant diabetes is similar to patients without liver disease with the same treatment goals to prevent renal failure, neuropathy, retinopathy, cardiovascular and cerebrovascular disease. Many patients require insulin therapy in the early stages. Oral hypoglycaemics can be used for a lesser degree of hyperglycaemia with little concern of interaction with immunosuppressive medications or damage to the transplanted liver. Early withdrawal or dose reduction of corticosteroids may improve glycaemic control.

Hypertension

Hypertension is a common complication in the post-transplant patient. The goal of antihypertensive therapy should be a blood pressure below 130/80.

Treatment of hypertension may include *thiazide or loop diuretics* especially in those patients with peripheral oedema, but must be used with caution, since they can increase the risk of hyperuricemia.

The *Calcium Channel Blockers* (CCBs), particularly the dihydropyridine class, are a particularly attractive choice because their vasodilatory effects may overcome the vasoconstriction induced by the CNIs. Diltiazem, verapamil and nicardipine should be avoided as they can increase serum levels of the CNIs.

Beta-blockers are less effective generally than CCBs, but can be used and do not affect CNI levels. The exception is carvedilol, which can cause elevated levels of CNIs and usually requires reduction in CNIs dosages to maintain therapeutic serum levels.

ACE inhibitors and angiotensin II receptor blockers are not used initially for hypertension, because of the increased risk of renal insufficiency and hyperkalaemia in early post-transplant recipients. However, once the acute problems early after LT have resolved, these agents may have a role to prevent diabetic nephropathy and the effect of ciclosporin upregulating angiotensin II receptors.

Dyslipidemia

Between 16% and 43% of liver transplant recipients have increased plasma cholesterol. Most patients with non-cholestatic liver disease have low serum cholesterol levels due to impaired hepatic synthesis and esterification.

Risk factors for post-transplant hypercholesterolemia include female gender, cholestatic liver disease, pre-transplant cholesterol elevation, diabetes, obesity and use of beta-blockers, diuretics or immunosuppressive agents. Ciclosporin, steroids and sirolimus have a significant effect on serum lipid levels. Tacrolimus has a minor effect, whereas mycophenolate and azathioprine have no significant effect on serum lipids.

Initial treatment for dyslipidaemia is lifestyle changes. All agents correcting lipoprotein metabolism have been used successfully in liver transplant patients, but have potential side effects.

Nicotinic acid can cause significant flushing, hyperglycaemia, hyperuricemia, gastrointestinal distress or rarely, hepatotoxicity.

Bile acid sequestrants (cholestyramine, colestipol and colesevelam) can decrease plasma mychophenolate levels by 35%. In addition, bile acid sequestrants can decrease absorption of CNIs. Thus, bile acid sequestrants should not be used in patients taking mychophenolate and should be given greater than 2 hours before or after CNI dosing.

Fibric acids (gemfibrozil, fenofibrate and clofibrate) can cause biliary sludge, dyspepsia or myopathy. Ezetimibe can be used, but with monitoring of CNI levels.

If a *statin* is used, hydrophilic statins (pravastatin or fluvestatin) are preferred since they are not metabolised by the same cytochrome 450 3A4 metabolic pathway that metabolises CNIs and sirolimus. The lipophilic statins (atorvastatin, lovastatin and simvastatin) are metabolised by the cytochrome P-450 3A4 metabolic pathway and must be used with caution, since they are associated with higher rates of myotoxicity at dosages greater than 20 mg/day.

The combination of a lipophilic statin and a fibric acid may significantly increase the risk of myotoxicity. Management of dyslipidaemia requires close patient follow-up to observe for possible side effects from the medications.

Obesity

It is common for patients post-transplant to have an improved sense of well-being, contributing to overeating. Liver recipients, who were overweight pre-operatively, tend to gain more weight. Patients transplanted for non-alcoholic steatohepatitis can develop recurrent steatosis in their liver if they gain weight after LT.

Treatment for obesity involves sensible diet, abstinence from alcohol, aerobic exercise programmes and considering altering immunosuppressive medications (lowering or discontinuing corticosteroids or switching from ciclosporin to tacrolimus).

Gout

Hyperuricemia is common in post-transplant recipients. Frequently, this condition occurs as a result of decreased uric acid excretion related to CNIs.

Preventing attacks usually consists of allopurinol and avoiding contributing medications, including thiazide diuretics, low-dose aspirin and nicotinic acid. Allopurinol can be used in patients on immunosuppressive agents, except with azathioprine (not commonly used in liver transplant recipients in Singapore), since the combination may increase the risk of azathioprine toxicity, including mylosuppression.

Acute gout attacks are treated with colchicine and corticosteroids as second line treatment. NSAIDs should be avoided in patients taking CNIs, since the combination can induce nephrotoxicity.

Metabolic Bone Disease

Many patients with chronic liver disease have decreased bone density before liver transplantation due to chronic liver disease. Bone loss occurs at an accelerated rate after LT and nadirs 6 months after the surgery. At 1 year after LT, bone densities are usually equivalent to the bone density at the time of transplant. The prevalence of skeletal fractures within 2 years after liver transplant is about 13%. Increased bone resorption is the prime contributor to the decline in bone density.

In patients transplanted due to cholestatic-related cirrhosis, additional factors contributing to osteoporosis include vitamin D malabsorption and unconjugated bilirubin impairing the proliferation of osteoblasts.

Non-pharmacologic therapies include alcohol and smoking cessation, increased physical activity and a balanced diet with 1500 mg of calcium and 800 IU of vitamin D daily. Treatment for osteoporosis in liver transplant recipients is not different from other patients and drugs used for treatment are not usually toxic to the liver.

Another important metabolic bone disease is osteonecrosis of the femoral head, which presents as hip pain due to corticosteroid use. This is diagnosed by Magnetic Resonance Imaging (MRI) and may require hip replacement.

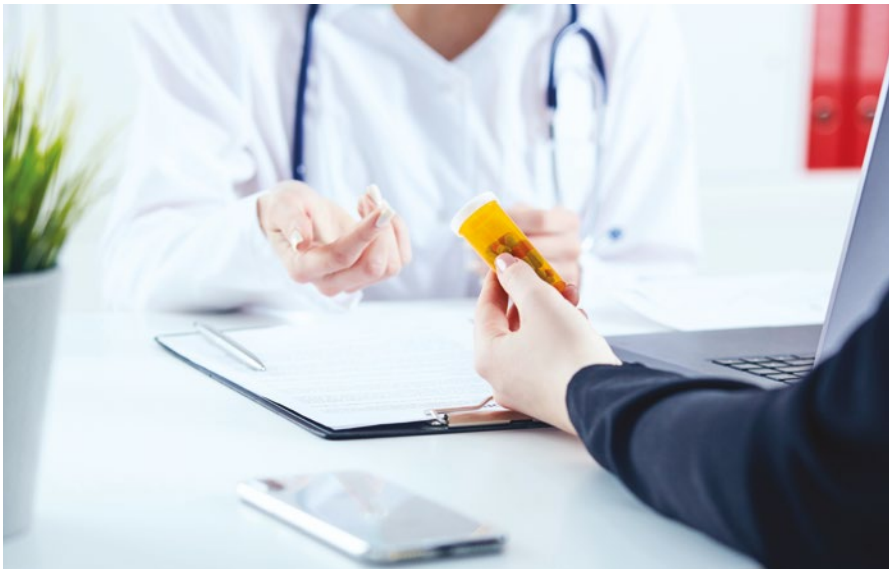
SUMMARY
With advances in surgical techniques, post-operative care and immunosuppressant regimes, transplant patient survival has increased enormously. The increase in patient survival has uncovered increased rates of cardiovascular disease, bone disease and renal disease in this patient group.

Indeed, this appears likely to happen as in the coming years with more patients receiving transplants and the overall survival of transplant patients improving, both primary and secondary care physicians should work hand-in-hand to provide comprehensive patient care. Communication between primary and secondary care in transplant medicine will help make this transition smooth and beneficial for patients as well as healthcare professionals.

At A Glance: Primary Care Management For Liver Transplants

Discuss with the transplant centre to minimise any medication that could be contributing to or causing any metabolic disorder(s).

Diabetes and metabolic bone disease management should include standard therapies.



Hypertension treatment should avoid using diltiazem, verapamil or carvedilol to a patient who is on a CNI; all other agents are safe to use.

Dyslipidaemia treatment can be associated with significant drug interactions. The preferred statin of choice is a hydrophilic statin (pravastatin or fluvestatin), since they will not interact with CNIs. The lipophilic statins (atorvastatin, lovastatin and simvastatin) will interact with CNIs and are associated with higher rates of myotoxicity at dosages greater than 20 mg/day.

Dose a bile sequestrant more than 2 hours before or after a CNI dose and do not use in patients also taking MMF or MPA.

Obese patients on CsA should not receive orlistat, otherwise use standard treatment.

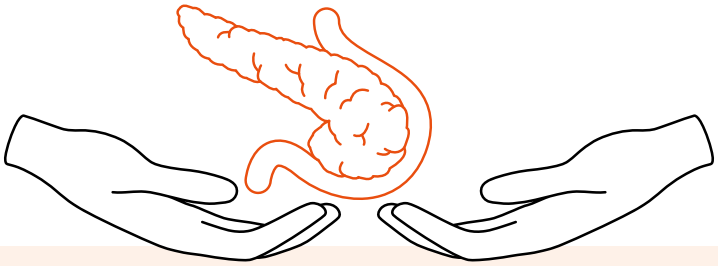
Gout management should include standard therapies, but avoid interactions between allopurinol with azathioprine and NSAIDs with CNIs.

Dr Reina Lim Tee Gan graduated with MBChB from the University of Glasgow, United Kingdom in 2003. She obtained her post-graduate degree in internal medicine, MRCP(UK) in 2006. She was awarded an advanced fellowship training in transplant hepatology at the University Hospitals Birmingham, UK in 2010 and subsequently obtained specialist accreditation in the field of Hepatology and Gastroenterology in 2012. She completed a PhD in "The metabolic effects of hypoxia and chronic hepatitis C" at the University Hospitals Birmingham, UK in 2016.

She is currently a Consultant at the Department of Gastroenterology and Hepatology, Singapore General Hospital and has an area of interest and expertise in liver transplant, metabolic liver disease and alcoholic liver disease.

GPs can call for appointments through the GP Appointment Hotline at **6321 4402** or scan the QR code for more information.

Pancreas Transplant Programme at Singapore General Hospital



PANCREAS TRANSPLANT IN SINGAPORE

The pancreas transplant programme at Singapore General Hospital (SGH) was started back in November 2012 as a collaborative effort with National University Hospital (NUH) to establish a national pancreas transplant programme. This was made possible with funding from the Ministry of Health (MOH) under the Health Services Development Programme (HSDP).

The current Programme Director is Dr Valerie Gan, Consultant from the Department of Urology, SGH. Working alongside her is Dr K Kamaraj, Consultant from the Department of Renal Medicine, SGH. Together with surgeons, physicians and allied health professionals from both the SGH and the NUH, the team screens for patients who are suitable to be placed on the waiting list and also oversee their pre and post-operative care.

WHO BENEFITS FROM PANCREAS TRANSPLANTATION?

In Singapore, there are about 400,000 diabetics and it is projected to rise to 1 million in 2050. One out of three Singaporeans will develop Diabetes Mellitus (DM) in their lifetime and two of three diabetes patients will develop kidney failure. With such alarming statistics, Singapore is ranked 1st in the world for diabetes-induced kidney failure

Type 1 diabetics with complications from diabetes, particularly kidney failure, are the best candidates for pancreas transplant. When a suitable candidate undergoes surgery, the transplanted pancreas produces sufficient insulin to control the patient's blood sugar and thus insulin injections will no longer be necessary. Over recent years, pancreas transplant has been found to also benefit a subpopulation of type 2 diabetics with kidney failure.

TYPES OF PANCREAS TRANSPLANT

There are three types of Pancreas Transplant surgery:

1. Simultaneous Pancreas-Kidney Transplant (SPK): The most common type of pancreas transplant. A Type I (and some Type 2) diabetic patient with kidney failure will receive both a pancreas and a kidney transplant from the same donor to minimise incompatibility.
2. Pancreas after Kidney (PAK): Indicated in patients with stable function of a previous renal allograft that meet the criteria for pancreas transplant.
3. Pancreas Transplant Alone (PTA): Indicated in Type I diabetics who have labile disease, frequently hypoglycaemic unawareness.

The pancreatic allograft survival rate is 86% at the 1 year and 53% at 10 years. SPK transplantation has showed good survival rate for 5 and 10 years of 87% and 70% respectively.

EVALUATION FOR PANCREAS TRANSPLANT

If a patient is considered a potential transplant recipient, he will undergo a comprehensive pre-transplantation work-up which includes blood and urine investigations, cardiac catheterisation, and surgical evaluation. After performing all these tests, if the patient meets all the qualifying criteria for pancreas transplant, he or she will be placed on the national waiting list for the transplant.

Pancreas is currently not included under the Human Organ Transplant Act (HOTA) and donations are sought from cadaveric donors under the Medical (Therapy, Education and Research) Act (MTERA).

If a suitable donor is found, the patient will undergo one above-mentioned transplant surgery.

HOW DO I REFER A PATIENT FOR CONSIDERATION FOR PANCREAS TRANSPLANTATION?

For more information on the SGH pancreas transplant programme, or if you wish to refer a patient for consideration for pancreas transplantation, please contact:

Clinical Coordinator
SingHealth Transplant Administrative and Resources Office
SGH Block 1B, Level 3 (Rooftop)
1 Hospital Drive, Singapore 169608
Tel: **6576 2273**
Email: **singhealth.transplant@singhealth.com.sg**

Hydrotherapy Services at KK Women's and Children's Hospital – Water-based Therapy for Chronic And Acute Conditions

WHAT IS HYDROTHERAPY?

Hydrotherapy is a water-based therapy that is used to complement land-based therapy for women and children with both acute and chronic conditions. Some examples of these conditions include chronic pain, osteoarthritis, sports injuries, neurodevelopmental delay, cerebral palsy and muscular dystrophy.

HOW DOES IT WORK?

Hydrotherapy uses the properties of water to reduce pain, strengthen weak muscles, restore function and improve quality of life. Density of the water is used as resistance for strengthening exercises. Additionally, buoyancy makes walking and movement in the water easier as it eliminates the effect of gravity. This means that people who are unable to walk on land are able to walk in the water.

The water is heated between 32 to 34 degrees Celsius which helps loosen and relax tight, stiff or spastic muscles. This results in less pain, better range of movement of the joints and improved mobility. Likewise, the hydrostatic pressure of the water can help reduce oedema and pain as well as improve range of motion and flexibility.

HYDROTHERAPY AT KKH

The hydrotherapy pool at KK Women's and Children's Hospital (KKH) is dedicated for use by women and children. It is equipped with newly renovated showering facilities which include a bathroom for physically disabled with hand-railings, call bells and a special shower chair for children.

The facilities at KKH are unique and adapted for children or adults with special needs. This includes the use of commodes and a ramp to facilitate entry into the pool for those who are unable to walk in on their own. The 11m-long pool has three different pool depths which enables the patient to experience therapy at different body weight loads. During hydrotherapy, we use special flotation aids, paddles and weights to assist in therapy.

The hydrotherapy service at KKH is managed by registered physiotherapists who are trained in hydrotherapy. They assess and treat patients according to their needs and provide an individualised exercise programme. The duration of each individual session is about 20 to 30 minutes.

KKH's Physiotherapy Department also offers an antenatal aqua fitness class for pregnant women every Saturday. The 45-minute class enables pregnant women to achieve and maintain a suitable level of physical fitness during pregnancy and involves aerobics, toning, strengthening and relaxation exercises.

WHO CAN BENEFIT FROM HYDROTHERAPY?

Any woman or child suffering from osteoarthritis, acute or chronic pain, reduced mobility, muscular weakness, post joint replacements, pain during pregnancy, sports injuries, cerebral palsy, muscular dystrophy or gross motor delay.

REFER A PATIENT

For hydrotherapy service, medical practitioners can fax a referral for a consultation and assessment to determine suitability to KKH's Rehabilitation Centre at **6394 1589**.

Antenatal aqua fitness classes at KKH are open to members of the public. For more information, please contact the Patient Education Centre at:
Tel: **6394 1268**
Email: **pec@kkh.com.sg**

SINGAPORE GENERAL HOSPITAL

Appointments: 6321 4402
Email: appointments@sgh.com.sg

APPOINTMENTS

Dr Koh Fangju Beatrice
Associate Consultant
Dept
General Surgery

Dr Tham Wei Ying
Associate Consultant
Dept
Nuclear Medicine & Molecular Imaging

Dr Ang Chay You
Associate Consultant
Dept
Orthopaedic Surgery

Dr Ang Fu Hong Benjamin
Associate Consultant
Dept
Orthopaedic Surgery

Dr Chen Yongqiang Jerry Delphi
Associate Consultant
Dept
Orthopaedic Surgery

Dr Huang Miao'en Deborah
Associate Consultant
Dept
Orthopaedic Surgery

Dr Tan Shi Ming
Associate Consultant
Dept
Orthopaedic Surgery

Dr Pek Wan Sze
Associate Consultant
Dept
Plastic, Reconstructive & Aesthetic Surgery

Dr Phang Chee Chin
Associate Consultant
Dept
Renal Medicine

Dr Kristen Alexa Lee
Associate Consultant
Dept
Vascular & Interventional Radiology

PROMOTIONS - SENIOR CONSULTANTS

Dr Kenny Loh Wei Tsen
Senior Consultant
Dept
Anaesthesiology

Dr Chan Mei Fung Michelle
Senior Consultant
Dept
Anatomical Pathology

Dr Cheng Chee Leong
Senior Consultant
Dept
Anatomical Pathology

Dr Ngo Nye Thane
Senior Consultant
Dept
Anatomical Pathology

Dr Cheng Tim-Ee Lionel
Senior Consultant
Dept
Diagnostic Radiology

Dr Sonali Ganguly
Senior Consultant
Dept
Endocrinology

SINGAPORE GENERAL HOSPITAL

Appointments: 6321 4402
Email: appointments@sgh.com.sg

PROMOTIONS - SENIOR CONSULTANTS

Dr Tan Hong Chang
Senior Consultant
Dept
Endocrinology

Dr Tan Shu Yun
Senior Consultant
Dept
Family Medicine & Continuing Care

Dr Goh Boon Bee
Senior Consultant
Dept
Gastroenterology & Hepatology

Dr Tan Hiang Keat
Senior Consultant
Dept
Gastroenterology & Hepatology

Dr Lee Yuh Shan
Senior Consultant
Dept
Haematology

Dr Sim Heng Chiak James
Senior Consultant
Dept
Microbiology

Dr Yan Xuexian
Senior Consultant
Dept
Nuclear Medicine & Molecular Imaging

Dr Poh Seng Yew
Senior Consultant
Dept
Orthopaedic Surgery

Dr Apoorva Gogna
Senior Consultant
Dept
Vascular & Interventional Radiology

Dr Damodharan Karthikeyan
Senior Consultant
Dept
Vascular & Interventional Radiology

PROMOTIONS - CONSULTANTS

Dr Koh Li Ying
Consultant
Dept
Anaesthesiology

Dr Loh Kent Neng Samuel
Consultant
Dept
Anaesthesiology

Dr See Hooi Geok
Consultant
Dept
Anaesthesiology

Dr Tan Keng Tiong Jerry
Consultant
Dept
Anaesthesiology

Dr Tan Yan Ling Selene
Consultant
Dept
Anaesthesiology

Dr Tan Yan Ru
Consultant
Dept
Anaesthesiology

SINGAPORE GENERAL HOSPITAL

Appointments: 6321 4402
Email: appointments@sgh.com.sg

PROMOTIONS - CONSULTANTS

Dr Teo Miqi Mavis
Consultant
Dept
Anaesthesiology

Dr Zeng Ling Antonia
Consultant
Dept
Anaesthesiology

Dr Chang Meihuan
Consultant
Dept
Colorectal Surgery

Dr Goh Minghui
Consultant
Dept
Colorectal Surgery

Dr Ng Jia Lin
Consultant
Dept
Colorectal Surgery

Dr Tham Wei Ping
Consultant
Dept
Diagnostic Radiology

Dr Chua Si Yong Ivan
Consultant
Dept
Emergency Medicine

Dr Suresh Rama Chandran
Consultant
Dept
Endocrinology

Dr Ravishankar Asokkumar
Consultant
Dept
Gastroenterology & Hepatology

Dr Ong Ming Liang Andrew
Consultant
Dept
Gastroenterology & Hepatology

Dr Ennaliza Salazar
Consultant
Dept
Gastroenterology & Hepatology

Dr Yip King Fan
Consultant
Dept
Geriatric Medicine

Dr Yap Tze-Jin Robert
Consultant
Dept
Hand Surgery

Dr Tan Ek Khoon
Consultant
Dept
Hepato-pancreato-biliary & Transplant Surgery

Dr Kavitha Garuna Murthee
Consultant
Dept
Internal Medicine

Dr Shum Koin Lon
Consultant
Dept
Internal Medicine

Dr Tan Bee Xian Jamie
Consultant
Dept
Microbiology

Dr Ngeow Jia Hao Alvin
Consultant
Dept
Neonatal & Developmental Medicine

Dr Huang Hian Liang
Consultant
Dept
Nuclear Medicine & Molecular Imaging

Dr Lim Liqing Serene
Consultant
Dept
Obstetrics & Gynaecology

Dr Mohd Mizan Marican
Consultant
Dept
Orthopaedic Surgery

SINGAPORE GENERAL HOSPITAL

Appointments: 6321 4402
Email: appointments@sgh.com.sg

PROMOTIONS - CONSULTANTS

Dr Lim Huili
Consultant
Dept
Pain Medicine

Dr Liu Weiyang Christopher
Consultant
Dept
Pain Medicine

Dr Pang Suh Chien
Consultant
Dept
Renal Medicine

Dr Tan Qiao Li
Consultant
Dept
Respiratory & Critical Care Medicine

Dr Thangavelautham Suhitharan
Consultant
Dept
Surgical Intensive Care

Dr Tien Jong-Chie Claudia
Consultant
Dept
Surgical Intensive Care

Dr Tay Hsien Ts'ung
Consultant
Dept
Vascular Surgery

NEW APPOINTMENTS

Dr Constance Teo Ee Hoon
Senior Consultant;
Head, SingHealth Duke-NUS Head & Neck Centre
Dept
Otolaryngology

Dr Anantham Devanand
Senior Consultant;
Head, SingHealth Duke-NUS Lung Centre
Dept
Respiratory & Critical Care Medicine

Assoc Professor Ruban Poopalalingam
Senior Consultant;
Deputy Chairman, Medical Board, SGH;
Chairman, Division of Anaesthesiology & Perioperative Medicine;
Academic Chair, Anaesthesiology & Perioperative Sciences Academic Clinical Programme (ANAES ACP);
Chairman, Elective Care Centre & New NDCS Commissioning Committee;
Adj Assoc Professor, Duke-NUS Medical School & NUS Yong Loo Lin School of Medicine
Dept
Anaesthesiology

Assoc Professor Tan Hwee Chye Andrew
Head & Senior Consultant;
Campus Director, SingHealth Duke-NUS Institute of Medical Simulation (SIMS);
Deputy Vice-Chair (Education), Musculoskeletal Sciences Academic Clinical Programme (MSKSC ACP);
Adj Assoc Professor, Duke-NUS Medical School & NUS Yong Loo Lin School of Medicine
Dept
Orthopaedic Surgery

CHANGI GENERAL HOSPITAL

Appointments: 6850 3333

NEW APPOINTMENT

Dr Goh Min Liong
Deputy Group Chief Medical Informatics Officer (Acute Care), SingHealth
Chief Medical Informatics Officer, CGH
Director, Service Operations, CGH

SENGKANG GENERAL HOSPITAL

Appointments: 6930 6000
Email: appointments@skh.com.sg

APPOINTMENTS - CONSULTANTS

Dr Huang Jingxiang
Consultant
Dept
Pathology

Dr Loh Tze Ping
Consultant
Dept
Pathology

APPOINTMENTS - ASSOCIATE CONSULTANTS

Dr Tay Wei Lin
Associate Consultant
Dept
General Medicine, Endocrinology

Dr Poh Kai Chin
Associate Consultant
Dept
General Medicine, Respiratory Medicine

Dr Chen Haobin
Associate Consultant
Dept
Orthopaedic Surgery

Dr Hamid Rahmatullah Bin Abd Razak
Associate Consultant
Dept
Orthopaedic Surgery

Dr Francis Wong Keng Lin
Associate Consultant
Dept
Orthopaedic Surgery

Dr Maaz Mohammad Salah
Associate Consultant
Dept
Radiology

Dr Lester Ong Wei Lin
Associate Consultant
Dept
Surgery

Dr Raj Vikesh Tiwari
Associate Consultant
Dept
Urology Service

SENGKANG GENERAL HOSPITAL

Appointments: 6930 6000
Email: appointments@skh.com.sg

PROMOTION - SENIOR CONSULTANT

Assoc Prof Choke Tieng Chek
Senior Consultant
Dept
Surgery

PROMOTIONS - CONSULTANTS

Dr Pek Jen Heng
Consultant
Dept
Emergency Medicine

Dr Loh Jiashen
Consultant
Dept
General Medicine, Infectious Disease

Dr Pooja Sachdeva
Consultant
Dept
General Medicine, Internal Medicine

Dr Soh Rui Ya
Consultant
Dept
General Medicine, Respiratory Medicine

Dr Ye Qinhao Jonathan
Consultant
Dept
General Medicine, Respiratory Medicine

Dr Siow Wei Ming
Consultant
Dept
Orthopaedic Surgery

Dr Mohammad Taufik Bin Mohamed Shah
Consultant
Dept
Radiology

Dr Cynthia Assimta Peter
Consultant
Dept
Radiology

Dr Yeap Phey Ming
Consultant
Dept
Radiology

Dr Sundaram Palaniappan
Consultant
Dept
Urology Service

KK WOMEN'S AND CHILDREN'S HOSPITAL

Appointments: 6294 4050
Email: centralappt@kkh.com.sg

APPOINTMENTS

Dr Kho Chye Lee
Associate Consultant
Division of Obstetrics & Gynaecology

Dr Koh Meiling, Serena
Associate Consultant
Division of Obstetrics & Gynaecology

Dr Jill Lee Cheng Sim
Associate Consultant
Division of Obstetrics & Gynaecology

KK WOMEN'S AND CHILDREN'S HOSPITAL

Appointments: 6294 4050
Email: centralappt@kkh.com.sg

APPOINTMENTS

Dr Lim Ee-Lin Sheri
Associate Consultant
Division of Obstetrics & Gynaecology

Dr Qi Maili
Associate Consultant
Division of Obstetrics & Gynaecology

PROMOTIONS - SENIOR CONSULTANTS

Dr Rashida Farhad Vasanwala
Senior Consultant
Endocrinology Service

Dr Ang Seng Bin
Senior Consultant
Family Medicine Service

Dr Wright Ann Margaret
Senior Consultant
Dept
Maternal Fetal Medicine

Dr Abdul Haium Abdul Alim
Senior Consultant
Dept
Neonatology

Dr Wijeweera Olivia
Senior Consultant
Dept
Paediatric Anaesthesia

Dr Chiang Li Wei
Senior Consultant
Dept
Paediatric Surgery

Dr Amos Loh Hong Pheng
Senior Consultant
Dept
Paediatric Surgery

Dr Rambha Rai
Senior Consultant
Dept
Paediatric Surgery

PROMOTIONS - CONSULTANTS

Dr Goh Si Hui
Consultant
Allergy Service

Dr Pang Siyan Jinnie
Consultant
Dept
KK Breast

Dr Chin Xinyi
Consultant
Endocrinology Service

Dr Khoo Zi Xean
Consultant
General Paediatrics Service

Dr Tan Keng Wein Jeanette
Consultant
General Paediatrics Service

Dr Chin Hui Xian Felicia
Consultant
Dept
Gynaecological Oncology

KK WOMEN'S AND CHILDREN'S HOSPITAL

Appointments: 6294 4050
Email: centralappt@kkh.com.sg

PROMOTIONS - CONSULTANTS

Dr Sim Wen Shan
Consultant
Dept
Maternal Fetal Medicine

Dr Ilka Tan
Consultant
Dept
Maternal Fetal Medicine

Dr Leow Hui Min Esther
Consultant
Nephrology Service

Dr Tan Yun June, Angela
Consultant
Dept
Paediatric Anaesthesia

Dr Cheong Yee Ling
Consultant
Dept
Paediatric Surgery

NEW APPOINTMENTS

Dr Chiou Fang Kuan
Head
Gastroenterology, Hepatology & Nutrition Service

Adj Assoc Prof Ng Yong Hong
Deputy Chairman
Division of Medicine

Adj Assoc Prof Thoon Koh Cheng
Deputy Chairman
Division of Medicine

NATIONAL CANCER CENTRE SINGAPORE

Appointments: 6436 8288
Email: callcentre@nccs.com.sg

APPOINTMENTS

Dr Lim Chiew Woon
Associate Consultant
Division of Medical Oncology

Dr Grace Kusumawidjaja
Associate Consultant
Division of Radiation Oncology

PROMOTIONS - SENIOR CONSULTANTS

Adj Asst Prof Chay Wen Yee
Senior Consultant
Division of Medical Oncology
Sub-specialty
Breast, Gynaecological Oncology

Adj Asst Prof Tai Wai Meng David
Senior Consultant
Division of Medical Oncology
Sub-specialty
Gastrointestinal, Upper Gastrointestinal, Hepato-Pancreato-Biliary, Colorectal, Neuro-oncology

Dr Wong Mabel
Senior Consultant
Division of Medical Oncology
Sub-specialty
Breast, Gynaecological Oncology

NATIONAL CANCER CENTRE SINGAPORE

Appointments: 6436 8288
Email: callcentre@nccs.com.sg

PROMOTIONS - SENIOR CONSULTANTS

Dr Chua Lee Kiang Melvin
Senior Consultant

Division of Radiation Oncology

Sub-specialty
Head & Neck, Neuro-oncology, Uro-Oncology

Dr Lim Wei Tching Faye Lynnette
Senior Consultant

Division of Radiation Oncology

Sub-specialty
Breast, Hepato-Pancreato-Biliary, Upper Gastrointestinal, Colorectal

PROMOTIONS - CONSULTANTS

Dr Lam Yick Ching Justina
Consultant

Division of Medical Oncology

Sub-specialty
Gastrointestinal, Peritoneal-based Malignancies

Dr Tan Wan Ling
Consultant

Division of Medical Oncology

Sub-specialty
Head & Neck, Lung, Uro-oncology

Dr Wong Ru Xin
Consultant

Division of Radiation Oncology

Dr Ong Eng Koon
Consultant

Division of Supportive & Palliative Care

Asst Prof Ong Chin-Ann Johnny
Consultant

Division of Surgical Oncology

NEW APPOINTMENTS

Assoc Prof Dent Rebecca Alexandra
Head & Senior Consultant

Division of Medical Oncology

Sub-specialty
Breast

Dr Neo Soek Hui Patricia
Head

Division of Supportive & Palliative Care

NATIONAL HEART CENTRE SINGAPORE

Appointments: 6704 2222
Email: central.appt@nhcs.com.sg

PROMOTION

Dr Soo Ing Xiang
Consultant

Dept
Cardiothoracic Surgery

Sub-specialty
Thoracic and Vascular Surgery

NATIONAL HEART CENTRE SINGAPORE

Appointments: 6704 2222
Email: central.appt@nhcs.com.sg

NEW APPOINTMENTS

Assoc Prof Yeo Khung Keong
Senior Consultant

Dept
Cardiology, NHCS
Deputy Group Chief Medical Informatics Officer (Research), SingHealth

Sub-specialty
Interventional Cardiology, Structural Heart Disease

Adj Assoc Prof Chin Chee Tang
Senior Consultant

Dept
Cardiology, NHCS
Chief Risk Officer, Risk Management, NHCS

Sub-specialty
Interventional Cardiology

NATIONAL NEUROSCIENCE INSTITUTE

Appointments: 6330 6363
Email: appointments@nni.com.sg

APPOINTMENTS

Dr Kaavya Narasimhalu
Associate Consultant

Dept
Neurology (SGH Campus)

Dr Koh Shimin Jasmine
Associate Consultant

Dept
Neurology (TTSH Campus)

Dr Seet Ying Hao Christopher
Associate Consultant

Dept
Neurology (TTSH Campus)

Dr Tan You Jiang
Associate Consultant

Dept
Neurology (SGH Campus)

Dr Yong Ming Hui
Associate Consultant

Neurology (SGH Campus)

PROMOTION - SENIOR CONSULTANT

Dr Vincent Ng Yew Poh
Senior Consultant

Dept
Neurosurgery

Sub-specialty
Cerebrovascular Surgery, Skull Base Surgery, Neurotrauma

PROMOTION - CONSULTANTS

Dr Pang Yee Hau
Consultant

Dept
Neurology (SGH Campus)

Sub-specialty
General Neurology

Dr Queck Kian Kheng
Consultant

Dept
Neurology (SGH Campus)

Sub-specialty
General Neurology

Dr Ling Ji Min
Consultant

Dept
Neurosurgery

Sub-specialty
Spinal Surgery

SINGAPORE NATIONAL EYE CENTRE

Appointments: 6322 9399
Email: appointments@snec.com.sg

APPOINTMENT

Dr Lim Pin Miao Fiona
Associate Consultant
Dept
General Cataract & Comprehensive Ophthalmology
Sub-specialty
Ophthalmology

PROMOTION - SENIOR CONSULTANTS

Dr Boey Pui Yi
Senior Consultant
Dept
Glaucoma
Sub-specialty
Ophthalmology

Dr Lim Shen Laurence
Senior Consultant
Dept
Surgical Retina
Sub-specialty
Ophthalmology

PROMOTION - CONSULTANTS

Dr Daniel Chua
Consultant
Dept
Refractive Surgery
Sub-specialty
Ophthalmology

Dr Kelvin Teo
Consultant
Dept
Medical Retina
Sub-specialty
Ophthalmology

Dr Daniel Ting
Consultant
Dept
General Cataract & Comprehensive Ophthalmology
Sub-specialty
Ophthalmology

Dr Andrew Tsai
Consultant
Dept
General Cataract & Comprehensive Ophthalmology
Sub-specialty
Ophthalmology

Dr Yong Kailing
Consultant
Dept
Oculoplastic
Sub-specialty
Ophthalmology

Dr Gillian Teh
Consultant
Dept
Oculoplastic
Sub-specialty
Ophthalmology

Dr Danny Cheung
Consultant
Dept
Surgical Retina
Sub-specialty
Ophthalmology

Don't Limit Your Challenges. Challenge Your Limits.

If you are a qualified doctor, a challenging career awaits you at SingHealth. We seek suitably qualified candidates to join us as:

- STAFF REGISTRARS / SERVICE REGISTRARS
- RESIDENT PHYSICIANS
- MEDICAL OFFICERS

Interested applicants are to email your CV with full personal particulars, educational and professional qualifications (including housemanship details), career history, present and expected salary, names of at least two professional references, contact numbers and e-mail address together with a non-returnable photograph.

Please email your CV to the respective institutions' email addresses/online career portals with the Reference Number MN1901.

SingHealth

The SingHealth Duke-NUS Academic Medical Centre draws on the collective strengths of SingHealth and Duke-NUS Medical School to drive the transformation of healthcare and provide affordable, accessible, quality healthcare.

With 42 clinical specialties, a network of 4 Hospitals, 5 National Specialty Centres, 9 Polyclinics and Bright Vision Community Hospital, it delivers comprehensive, multidisciplinary and integrated care.

To enhance community care, the new Outram Community Hospital on the SGH Campus will be completed by 2020.

Singapore General Hospital

Departments seeking Resident Physicians and Staff Registrars:

- Surgical Departments (such as ENT and General Surgery)
- Staff Clinic

Website: www.sgh.com.sg
Career Portal: www.sgh.com.sg/subsites/sgh-careers/medical/pages/career-opportunites.aspx
Email: careers.medical@sgh.com.sg

KK Women's and Children's Hospital

Departments seeking: Consultant/Associate Consultant (Haematologist):

- Pathology & Laboratory Medicine

Resident Physicians:

- Breast
- Emergency Medicine
- Obstetrics & Gynaecology
- Orthopaedic Surgery (ORTHO)
- Otolaryngology (ENT)

Staff Registrars:

- Emergency Medicine
- Ophthalmology Service (EYE)

Staff Physician:

- Paediatric Surgery

Website: www.kkh.com.sg
Email: medical.hr@kkh.com.sg

Sengkang General Hospital

Departments seeking Resident Physicians and Staff Registrars:

- Anaesthesiology
- Cardiology
- Surgery
- General Medicine (with interest in Endocrinology, Gastroenterology, Geriatric Medicine, Rehabilitation Medicine, Renal Medicine and Respiratory Medicine)
- Intensive Care Medicine
- Neurology
- Orthopaedic Surgery
- Plastic, Reconstructive & Aesthetic Surgery Services
- Urology Service

Website: www.skh.com.sg
Career Portal: www.skh.com.sg/careers/Pages/careers.aspx
Email: careers@skh.com.sg

National Heart Centre Singapore

Departments seeking Resident Physicians:

- Cardiology
- Cardiothoracic Surgery

Website: www.nhcs.com.sg
Email: hr_mgr@nhcs.com.sg

National Neuroscience Institute

Departments seeking Resident Physicians and Service Registrars:

- Neurology
- Neuroradiology
- Neurosurgery

Website: www.nni.com.sg
Email: nni_hr@nni.com.sg

Singapore National Eye Centre

Department seeking:

- Resident Physician, Opthalmology
- Primary Eye Care Physician (Full-time/Locum)
- Ophthalmic Anaesthetist

For more information, please visit the **Career Opportunities** section on the **Singapore National Eye Centre** website.

Website: www.snec.com.sg
Email: recruitment@snec.com.sg

SingHealth Community Hospitals

(Sengkang Community Hospital, Outram Community Hospital and Bright Vision Hospital)

Department seeking Resident Physicians and Staff Registrars:

- Family Medicine

Department seeking Senior Consultant, Consultant, Associate Consultant, Resident Physicians, Staff Registrars:

- Post-Acute and Continuing Care Service

Website: http://www.singhealthch.com.sg/
Career Portal: www.singhealth.com.sg/SCH/careers/Pages/Careers.aspx
Email: schrecruitment@singhealthch.com.sg

Child Trauma Conference 2019: Prevention to Recovery

KK Women's and Children's Hospital, with the support of Temasek Foundation Cares, is organising the first-ever Child Trauma Conference in Singapore. The theme "Prevention to Recovery" focuses on building trauma resilience and recovery in children. The conference will convene international trauma experts and professionals in child mental health and welfare to share their experience, and discuss new findings and latest best practices in child trauma management.

DATES: Pre-conference: 3 April 2019, Wednesday Main conference: 4 – 5 April 2019, Thursday – Friday	**TIME:** 8.30am – 5.00pm **VENUE:** Academia, Singapore 20 College Road, Singapore 169856	**FEES:** **Pre-conference:** $150 **Main conference:** $120 (Fully registered)

REGISTRATION IS REQUIRED.
For more details or to register, please visit **www.childtraumaconference.sg**
For enquiries, please email **admin@childtraumaconference.sg**

SGH Plastic Surgery GP Forum 2019

When Should You Refer to Your Friendly Plastic Surgeon?

Sponsors:

Baxter | ETHICON Part of the Johnson & Johnson Family of Companies — Shaping the future of surgery

Date:	Time:	Venue:	Fees:
Saturday, 6th April 2019	1.00pm to 5.00pm	Learning Space, SGH Blk 6, level 1	Free

Complimentary parking is available for confirmed participants at **Blk 3 Basement 2, SGH**

CME points will be accredited

Time	Topic & Speaker
1.00pm	Lunch and registration
1.55pm	**Welcome and Introduction** Assoc Prof Ong Yee Siang, Head and Senior Consultant, SGH, Department of Plastic, Reconstructive and Aesthetic Surgery
Session 1 (Moderator: Dr Pearlie Tan)	
2.00pm	**Basic to Advanced Wound Care** Dr Chew Khong Yik
2.15pm	**Facial Skin Cancer:** When do you refer that lump on the face? Dr Adrian Ooi
2.30pm	**Correction of Droopy Eyelids and Facial Asymmetry** Dr Wong Manzhi
2.45pm	BREAK
Session 2 (Moderator: Dr Adrian Ooi)	
3.00pm	**Scar Management:** What can you do and what's new? Dr Pearlie Tan
3.15pm	**Breast Cancer and Lymphedema:** Cutting Edge Management Prof Tan Bien Keem
3.30pm	**Breast Reduction and Gynaecomastia:** When is surgery necessary? Dr Pek Wan Sze
3.45pm	**Suturing Workshop** Dr Jana Joethy
4.30pm	**Closing and Thanks** Assoc Prof Ong Yee Siang, Head and Senior Consultant, SGH, Department of Plastic, Reconstructive and Aesthetic Surgery

REGISTER BY 23 MARCH 2019

For registration and enquiries, please email **gpnetwork@sgh.com.sg** and provide:

1. Full name and MCR No.
2. Clinic contact details

Courses

Pre-Diabetes Interventions and Continued Tracking to Ease-out Diabetes (Pre-DICTED) Programme

Individuals with pre-diabetes are at high risk of developing diabetes, which can lead to stroke, kidney disease and heart disease.

Pre-DICTED aims to evaluate the effectiveness of lifestyle intervention, with stepwise addition of metformin, if required, among those with pre-diabetes. The lifestyle interventions are designed to equip participants with the knowledge and skills to make lifestyle changes to reduce their risk of developing diabetes.

We are recruiting local participants with pre-diabetes for the programme.

Contact us if you have patients who:

- Are aged between 18 and 64 years-old (inclusive)
- Have a Body Mass Index (BMI) of 23.0 kg/m^2 and above
- Are diagnosed with pre-diabetes based on:
  - Fasting plasma glucose: 6.1 - 6.9 mmol/L (110-125 mg/dL) (Impaired Fasting Glucose; IFG) and/or
  - 2-hr plasma glucose (OGTT): 7.8 - 11.0 mmol/L (140-199 mg/dL) (Impaired Glucose Tolerance; IGT)

Their blood sugar level will be monitored every 6 months for up to 3 years.

Study-related tests and evaluation will be provided at no cost. We will keep you informed on the status and test results of your patients if they are enrolled into the programme.

For more details, please visit **www.predicted.com.sg**

How to refer patients?

After seeking your patient's permission, please email predicted@singhealth.com.sg or text 9115 6276 with your patient's name and contact number. We will follow-up with them. You can also ask your patients to contact us directly.

Conducted by:

SingHealth DukeNUS ACADEMIC MEDICAL CENTRE
Diabetes Centre

SingHealth
www.singhealth.com.sg

GP FAST TRACK APPOINTMENT HOTLINES

Singapore General Hospital	6321 4402
Changi General Hospital	6850 3333
Sengkang General Hospital	6930 6000
KK Women's and Children's Hospital	6294 4050
National Cancer Centre Singapore	6436 8288
National Dental Centre Singapore	6324 8798
National Heart Centre Singapore	6704 2222
National Neuroscience Institute	6330 6363
Singapore National Eye Centre	6322 9399

DIRECT WARD REFERRAL CONTACT NUMBERS

Singapore General Hospital	6321 4822
Changi General Hospital	6788 8833
KK Women's and Children's Hospital	6394 1180

SINGHEALTH DUKE-NUS ACADEMIC MEDICAL CENTRE

- Singapore General Hospital
- Changi General Hospital
- Sengkang General Hospital
- KK Women's and Children's Hospital
- National Cancer Centre Singapore
- National Dental Centre Singapore
- National Heart Centre Singapore
- National Neuroscience Institute
- Singapore National Eye Centre
- SingHealth Community Hospitals
- Polyclinics SingHealth

Reg. No.: 200002698Z