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FOCUS: OBSTETRICS AND GYNAECOLOGY

█ Gestational Diabetes Mellitus – A Common Pregnancy Condition

█ Vaccination
in Pregnancy

█ Bladder Pain
Syndrome

█ Sexual Dysfunction
in Women



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Gestational Diabetes Mellitus – A Common Pregnancy Condition

Professor Tan Kok Hian, Head and Senior Consultant, Perinatal Audit and Epidemiology Unit, Division of Obstetrics and Gynaecology, KK Women's and Children's Hospital

Gestational Diabetes Mellitus (GDM) is a condition in which the body does not produce enough of the hormone insulin to control sugar levels during pregnancy. It is a common complication of pregnancy ranging from 10% to 20% of all pregnant women in Singapore.

WHAT ARE THE RISKS OF GDM?

GDM puts both mother and child at serious risks. The baby can have excessive weight gain (also known as macrosomia) and hypoglycaemia (low blood sugar) after birth, develop fetal abnormalities, and even succumb to sudden fetal death.

The mother can develop high blood pressure and pre-eclampsia while pregnant, give birth prematurely and run the risk of getting Type 2 Diabetes Mellitus (DM) in her lifetime.

HOW TO DETECT GDM?

Screening for all pregnant women during pregnancy is the most effective way to detect and manage it early. The screening test for GDM is a three-point Oral Glucose Tolerance Test (OGTT).

After fasting overnight, the woman's blood is taken and tested at three time-points at:

- **Starting (Fasting); one hour; two hours** after taking a flavoured sweet drink calibrated at 75-gram glucose load.

Any blood sugar levels above a certain criteria value for each of the three time-points is considered GDM. The criteria for each of the time-points are derived from an international study (HAPO Study) of which KK Women's and Children's Hospital (KKH) is one of the 15 main study centres.

WHEN IS THE BEST TIME TO DO OGTT?

The routine screening for GDM for pregnant women is best performed at 24 to 28 weeks. However, if there are any risk factors, e.g., persistent sugar in the urine or previous history of GDM on insulin, the screening may be done earlier.

WHAT IS THE TREATMENT FOR GDM?

The treatment of GDM varies, depending on the result of the OGTT. **If the condition is mild**, controlling the diet is often enough. **For more severe cases**, oral medications (metformin) or insulin injections (depending on severity) may be required for the remainder of the pregnancy.

A dietitian will advise on a sensible eating plan, which is to have a healthy diet and foods with a low glycaemic index. Regular exercise (such as walking for 30 minutes after a meal) to improve glycaemic control is recommended. Women with GDM should have regular monitoring of fetal growth and deliver by full-term.

WHAT FOLLOW-UP ACTION IS REQUIRED AFTER DELIVERY FOR WOMEN WITH GDM DURING PREGNANCY?

Women with GDM should be encouraged and supported to breastfeed as breastfeeding reduces risk of obesity and diabetes in the children. The dose of metformin, glibenclamide and/or insulin may be reduced or stopped after birth as indicated.

A repeat OGTT (two-point test) should be performed 6 weeks after delivery, with a follow-up in the clinic to ensure that the high sugar level has resolved. This can exclude existing Type 2 DM and will also identify women with impaired glucose tolerance, for whom referral for more active follow-up and intervention is required.

Even if the postnatal OGTT is normal, women with a history of GDM should be informed about the increased risk of developing Type 2 DM in her lifetime and hyperglycaemia in subsequent pregnancies, and should be offered lifestyle advice that includes weight control, diet and exercise.

Women with background risk factors (e.g., obesity, strong family history of Type 2 DM, insulin required during pregnancy, metabolic syndrome etc.) should have more frequent screening (yearly) than those at lower risk (once every 2 to 3 years).

WHY IS IT IMPORTANT TO FOLLOW UP AFTER DELIVERY?

Although GDM resolves in most women after their pregnancy, these women still have a much higher risk of developing Type 2 DM in their lifetime. Type 2 DM, if not detected ear-



ly or not well-controlled, can be associated with permanent complications to the kidneys, eyes and blood vessels.

There is evidence that certain lifestyle changes to diet and exercise can help delay or even prevent the development of Type 2 DM after GDM. Follow-up after delivery is therefore important for detecting persisting or the onset of Type 2 DM, in order to achieve prompt and optimal control and treatment of the condition.

WHAT ARE THE MEASURES TO REDUCE THE FUTURE RISK OF TYPE 2 DM?

The main ways to reduce the risk of developing Type 2 DM after GDM are **sensible eating and regular exercise**, both of which contribute to reducing body weight and Body Mass Index (BMI). A high BMI is associated with an increased risk of developing Type 2 DM.

Weight loss should be slow, steady and sustained. The recommended rate of weight loss is 0.5 to 1kg per week. A reduction of 7% body weight in 6 months is a safe and effective weight loss goal.

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Professor Tan Kok Hian is the Head and Senior Consultant of the Perinatal Audit and Epidemiology Unit, Department of Maternal Fetal Medicine, KK Women's and Children's Hospital (KKH). Professor Tan is also the Lead for Gestational Diabetes Mellitus (GDM) at the SingHealth Duke-NUS Diabetes Centre and the Lead Principal Investigator of the NMRC-funded Integrated Platform for Research in Advancing Metabolic Health Outcomes of Women and Children (IPRAMHO).

Professor Tan initiated universal screening for GDM, and the new International Association of Diabetes and Pregnancy Study Groups criteria, in KKH and Singapore General Hospital since January 2016 - based on a cost-effectiveness study of GDM screening under the *Growing Up towards Healthy Outcomes* (GUSTO) study. He is also the Chairperson of the College of Obstetricians and Gynaecologists, Singapore GDM Committee 2017-2018 and Chairperson, Expert Group GDM Appropriate Care Guide of the Agency for Care Effectiveness, Ministry of Health 2017-2018.



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Vaccination in Pregnancy

■ *Dr Serene Thain, Associate Consultant,
Division of Obstetrics and Gynaecology, KK Women's and Children's Hospital*
*Dr Shephali Tagore, Head and Senior Consultant,
Department of Maternal Fetal Medicine, KK Women's and Children's Hospital*

The Ministry of Health Singapore strongly recommends influenza and pertussis vaccination in pregnancy, in line with international guideline recommendations from the United Kingdom, the United States and other countries.

In 2017, the Ministry extended the use of Medisave for vaccines under the National Adult Immunisation Schedule, which include the vaccines against influenza and pertussis.



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INFLUENZA VACCINATION IN PREGNANCY

INTRODUCTION

Influenza is a highly infectious respiratory viral illness that is transmitted from person to person via respiratory droplets propelled by coughing and sneezing, or via contact with contaminated surfaces.

The contagious period is from 1 day before the onset of symptoms till 5 to 7 days after onset. Common symptoms include fever, headache, chills, cough, sore throat, muscle aches, generalised malaise and fatigue.

Locally in Singapore, influenza is commonly seen, with between 1,500 and 3,500 people experiencing influenza-like illness every week. While most infected people will recover within 1 to 2 weeks, pregnant women, at any stage of pregnancy, are more likely to develop severe illness and are therefore at a higher risk of morbidity, and even mortality.

IMPACT OF INFLUENZA ON THE FETUS/NEONATE

- Potential increased risk of congenital abnormalities in the first trimester of pregnancy
- Maternal hyperthermia may increase the risk of certain birth defects
- Increased risk of obstetric complications, such as spontaneous abortion, preterm delivery, low birth weight and fetal death
- Infants less than 6 months old (neonates) infected with the influenza virus have the highest rates of hospitalisation and mortality compared to children of other older age groups

BENEFITS OF ANTENATAL INFLUENZA VACCINATION

- Reduces the risk of serious maternal medical complications
- Provides passive protection to the neonate via trans-placental transmission of antibodies (especially since the influenza vaccine cannot be administered for infants less than 6 months old)

INFORMATION ON THE INACTIVATED INFLUENZA VACCINE

- **The inactivated influenza vaccine is safe in all trimesters of pregnancy**, with studies conducted by the Centre for Disease Control and Prevention of the United States showing no evidence of a link between influenza vaccination administration and pregnancy complications or adverse fetal outcomes.

- **The vaccine is administered as a single dose**; repeated yearly with an updated vaccine.
- **Common side effects** experienced after an influenza vaccination include soreness, redness or swelling at the injection site from the shot, fainting, headache, fever, muscle aches, nausea and fatigue. If these side effects occur, they usually begin soon after the shot is administered and can last for about 1 to 2 days.
- **Rarely, influenza vaccines can cause serious problems** such as severe allergic reactions. People who have had a severe allergic reaction (e.g., anaphylaxis) after a previous dose, or a severe allergy to any of the vaccine components, should abstain from getting the vaccine.

PERTUSSIS VACCINATION IN PREGNANCY

INTRODUCTION

Pertussis, also known as whooping cough, is a highly contagious respiratory disease caused by the bacterium *Bordetella pertussis*. It is transmitted from person to person usually via coughing or sneezing, or via close contact in an enclosed environment.

Symptoms usually develop within 5 to 10 days after exposure, but sometimes not for as long as 3 weeks. Pertussis has an insidious onset with catarrhal symptoms and intermittent cough.

There has been an increase in the number of reported cases of pertussis worldwide since the 1980s.

RATIONALE FOR PREGNANT WOMEN TO UNDERGO TDAP VACCINATION

Pregnant women are encouraged to undergo vaccination against tetanus toxoid, reduced diphtheria toxoid and acellular pertussis (Tdap).

The main aim of the antenatal Tdap vaccination is to provide passive protection to the neonate/infant via trans-placental transmission of antibodies (especially since the Tdap vaccine can only be administered to infants from 2 months of age).

Unvaccinated or incompletely vaccinated infants who are less than 12 months of age have a high risk of severe illness. Infants with pertussis who need treatment in hospital have an approximately 61% risk of apnoea, 23% risk of pneumonia, 1.1% risk of seizures, 1% risk of death and 0.3% risk of encephalopathy.

Vaccination is recommended with each pregnancy to provide maximal protection to every infant, as vaccine-induced pertussis antibodies wane over time and the protective antibody levels required in newborn infants is unknown.



INFORMATION ON THE TDAP VACCINE

- **The Tdap vaccine is safe for use in pregnancy**, with studies showing no link between Tdap vaccine administration and increased risk of pregnancy complications, such as low birth weight or preterm delivery.
- **The vaccine is administered as a single dose intramuscularly**, preferably at the deltoid area, between the 16th to 32nd week of each pregnancy.
- **Maternal immune response to the vaccine** peaks at about 2 weeks after administration.
- **Common side effects** experienced after a Tdap vaccination include erythema, swelling, pain and tenderness at the injection site, body ache, fatigue and fever.
- **Rarely, Tdap vaccines can cause serious problems** such as severe allergic reactions. People who have had a severe allergic reaction (e.g., anaphylaxis) after a previous dose, or a severe allergy to any of the vaccine components, should not receive the vaccine.

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Dr Serene Thain is an Associate Consultant with the Division of Obstetrics and Gynaecology, KK Women's and Children's Hospital. She received her undergraduate medical degree from the Yong Loo Lin School of Medicine in 2010, and obtained postgraduate degrees in Surgery in 2013 and Internal Medicine in 2014. In 2015, she was awarded the MRCOG Prize Medal for being the overall highest scoring candidate, and the 4th Asia-Oceania Congress of O&G Gold Medal for the Master of Medicine (Obstetrics & Gynaecology) examinations.

Dr Thain is a clinical tutor for Yong Loo Lin School of Medicine, Lee Kong Chian School of Medicine and Duke-NUS Medical School. She is also an active council member of the Obstetrics & Gynaecological Society, Singapore, and a journal reviewer for the Singapore Journal of Obstetrics and Gynaecology.

Dr Thain is pursuing subspecialty training in the field of Maternal Fetal Medicine. Her focus and interest within the subspecialty is that of Obstetric Medicine, which deals with the management and optimisation of high-risk pregnancies of women with complex medical conditions.



As Head of the Department of Maternal Fetal Medicine at KK Women's and Children's Hospital (KKH), *Dr Shephali Tagore* leads in high-risk obstetrics and operative obstetrics, and implements risk reduction strategies towards safer clinical care.

Dr Tagore is also Director of the Obstetrics & Gynaecology International Medical Programme at KKH, and is actively involved in teaching, training and research activities. She has a passion for organising overseas training in obstetrics emergencies within Southeast Asia, and leads teams in teaching simple and safe obstetrics practices to improve perinatal outcomes.

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Bladder Pain Syndrome

■ Dr Lim Shau Khng Jason, Consultant,
Department of Obstetrics and Gynaecology, Singapore General Hospital

There are widespread definitions for the condition, Bladder Pain Syndrome (BPS). The European Society for the Study of BPS (ESSIC) in 2008 defined BPS as 'pelvic pain, pressure or discomfort perceived to be related to the bladder, lasting at least 6 months, and accompanied by at least one other urinary symptom, for example persistent urge to void or frequency, in the absence of other identifiable causes'.¹

More recently, the American Urological Association has described BPS as 'an unpleasant sensation (pain, pressure, discomfort) perceived to be related to the urinary bladder, associated with lower urinary tract symptoms of more than 6 weeks duration, in the absence of infection or other identifiable causes'.²

BPS may be associated with negative cognitive, behavioural, sexual or emotional consequences, as well as symptoms suggestive of sexual dysfunction according to the European Association of Urology. In 2016, The Royal College of Obstetricians and Gynaecologists, together with The British Society of Urogynaecology, issued a Green-top guideline on the management of BPS.³

Bladder Pain Syndrome is a chronic condition with an unknown aetiology. Over the years, there have been many definitions and criteria surrounding this unfathomable condition. It is now generally accepted as a diagnosis of exclusion with no definitive diagnostic or confirmatory test.



A large American study found prevalence rates of 2.3% - 6.5%. BPS is between 2 and 5 times more common in women than in men.⁴ A systematic review found the most commonly reported symptoms of BPS to be bladder/pelvic pain, urgency, frequency and nocturia.⁵ However, the prevalence of this condition remains elusive in many parts of the world, due to the variations in consensus in defining the symptoms and diagnostic criteria.

A number of expert panels, including the ESSIC¹ American Urological Association², European Association of Urology⁷ and International Consultation on Incontinence⁶, have published symptom-based diagnostic criteria for BPS. All include the symptoms of pain related to the bladder, at least one other urinary symptom, absence of identifiable causes and minimum duration of symptoms of 6 weeks² to 6 months.

CLINICAL PRESENTATION

Despite the multi-faceted nature of BPS, certain fundamental principles in the assessment and management of this condition remain.

A combination of thorough medical history and physical examination should be undertaken by the clinician in the approach to BPS.

Building Rapport

Establishing rapport and empathy with the affected patient is vital in understanding the complexity of the symptoms and adverse impact on the quality of life. This is similar to the management of chronic pelvic pain syndromes. Patients should be encouraged to talk about their symptoms and any theories that they have about the origins of the pain. This allows engagement in further investigations and management of their condition.^{8,9}

Symptoms Assessment

It is important to explain that BPS is a chronic condition with periods of fluctuating symptom severity, where symptoms may be life-long.

Symptoms assessment forms the basis of the initial evaluation. Symptoms include suprapubic pain related to bladder



filling, urgency, increased daytime and night-time frequency, in the absence of any identifiable pathology or infection. The location of the pain has been described in several studies and the most commonly reported sites are the bladder, urethra and vagina. The description of the pain ranges from pressure and aching to a burning sensation.

Aggravating and Alleviating Factors

A study of 565 patients with the condition was used to identify factors that can aggravate and alleviate the condition. Voiding was found to relieve the pain in 57% - 73% of patients. Pain was aggravated by stress (61%), sexual intercourse (50%), constrictive clothing (49%), acidic beverages (54%), coffee (51%) and spicy foods (46%).

The Events Preceding IC study of 158 women with BPS¹⁰⁻¹² found that pain worsened with certain food or drink, and/or worsened with bladder filling, and/or improved with urination in 97% of patients.

Excluding Other Potential Causes

Due to its nature of diagnosis of exclusion, it is imperative that other potential causes of bladder pain or lower urinary tract symptoms have to be considered, such as urinary tract infections, sexually transmitted infections, other bladder diseases (e.g., calculi, tumours etc.), as well as previous pelvic surgery.

The location of the pain, and relationship to bladder filling and emptying should be established.

The characteristics of the pain, including trigger factors and onset, correlation with other events and description of the pain, should be recorded.

Careful exploration into the woman's history for any physical or sexual abuse should also form part of the clinical assessment.



Physical examination should be performed to rule out urinary retention, hernias and painful trigger points on abdominal palpation. A genital examination should also be done to rule out atrophic changes, prolapse, vaginitis and trigger point tenderness over the urethra, vestibular glands, vulvar skin or bladder. Features of dermatosis, including vulvar or vestibular disease, should be looked for. Superficial or deep vaginal tenderness, and tenderness of the pelvic floor muscles, should be assessed during the course of the examination.

A bimanual pelvic examination is helpful to rule out uterine, cervical or adnexal pathology.

WORK-UP

Both a 3-day bladder diary (frequency volume chart) and a food diary should be employed to determine the urinary habits, as well as to identify if specific foods cause a flare-up of symptoms, respectively.

Urine should be tested to rule out a UTI, as this is a prerequisite for diagnosis of BPS. Investigations for urinary ureaplasma and chlamydia can be considered in symptomatic patients with negative urine cultures and pyuria.

In those with persistent microscopic or macroscopic haematuria, urine cytology should be tested for the suspicion of urological malignancy. Cystoscopy and a referral to urology should then be initiated accordingly.

Bladder Pain Syndrome is a diagnosis of exclusion.¹ Hence, other conditions should be excluded as follows:

- malignancy, e.g., bladder carcinoma/carcinoma in situ, cervical, uterine or ovarian cancer
- infection of the urinary or genital tract
- overactive bladder
- radiation cystitis or drug-mediated cystitis, e.g., cyclophosphamide, ketamine
- bladder outlet obstruction or incomplete bladder emptying
- calculus of the bladder or lower ureter
- urethral diverticulum
- pelvic organ prolapse
- endometriosis
- pudendal nerve entrapment or pelvic floor muscle-related pain
- irritable bowel syndrome
- diverticular disease of the bowel

INITIAL MANAGEMENT

The management choices for BPS are multi-varied. These range from a spectrum of conservative to invasive multi-disciplinary treatments, depending on the severity of the symptomatology.

Once BPS has been diagnosed, it is imperative to address the patient's expectations and the impact of the symptoms on her quality of life, prior to tailoring an individualised therapy together with the patient.

Conservative treatments encompass dietary modification, stress management and analgesia. Dietary avoidance of caffeine, alcohol, acidic foods and drinks (citrus fruits, carbonated drinks, chocolates and tomatoes¹¹) may bring about improvement in symptoms.

Stress reduction (such as relaxation techniques, music listening and meditation) and regular exercises have also reported symptomatic improvement.¹³ Different selections and cocktails of analgesia may be useful in treating the key symptom of pain in this condition.

Early referral to a pain specialist should be considered in patients with chronic refractory symptoms. There is, however, limited evidence on the benefits of acupuncture.

Oral amitriptyline or cimetidine may be considered when first-line conservative treatments have failed. A systematic review of two randomised controlled trials using increasing titrated doses of amitriptyline between 10 mg and 100 mg over a 4-month period showed trends in improvement in urinary urgency, frequency and pain scores in both trials compared with non-treated patients.¹⁴ One RCT compared 36

patients treated with a 3-month course of 400 mg cimetidine orally versus placebo twice daily. All patients had symptomatic improvements, but these were more pronounced in the treatment group, especially for pain and nocturia.

The small sample size and short duration of follow-up are limiting factors in this study.¹⁵ Cimetidine is currently not licensed to treat BPS and should only be commenced by a clinician specialised to treat this condition.

Multimodal therapy may be considered if single drugs are unsuccessful, but should be commenced by specialists with expertise and consideration of multidisciplinary input.

If either conservative or pharmacological treatments have been unsuccessful, other invasive therapies may be considered or added using an individualised approach, under the guidance from a multi-disciplinary input (physiotherapist, pain team, clinical psychologist, urologist, urogynaecologist). Several intra-vesical treatments using various medications may be enlisted by the multi-disciplinary team.¹⁶⁻²¹

BPS AND PREGNANCY

Woman can be advised that the effect of pregnancy on the severity of BPS symptoms can be variable. A patient survey conducted by the Interstitial Cystitis Association in 1989 showed that there was a wide variation in the perception of BPS symptoms during the pregnancy and the puerperium.²³

BPS was also not affected by the mode of delivery. BPS treatment options considered safe in pregnancy include oral amitriptyline and intravesical heparin.^{23,24} Currently, there is inadequate robust evidence underlying the rest of the therapies.^{25,26}

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Dr Lim Shau Khng Jason is an obstetrician, gynaecologist and urogynaecologist at the Department of Obstetrics & Gynaecology (O&G) at Singapore General Hospital. He completed his subspecialty fellowship in Urogynaecology and Advanced Female Pelvic Floor Reconstructive Surgery in England, at the University College London Hospitals and John Radcliffe Hospital in Oxford.

His areas of clinical practice include obstetrics (childbirth), general gynaecology, female pelvic floor reconstructive surgery (urinary incontinence and pelvic organ prolapse), benign gynaecology minimally-invasive surgery, postpartum pelvic floor preventive medicine and intrapartum management and obstetric emergencies.

Dr Lim also pioneered and leads the Postnatal Assessment Service in the Department of O&G at the SGH, the first of its kind for postpartum service in Singapore. He is also an Adjunct Assistant Professor at the Yong Loo Lin School of Medicine, NUS, as well as at the Duke-NUS Graduate School of Medicine for undergraduate studies. His postgraduate academic undertakings includes the SingHealth Residency Transitional Year Core Faculty and SingHealth PGY1 Core Faculty, as well as Core Faculty under the SingHealth Residency O&G Programme.



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Sexual Dysfunction in Women

Dr Tan Tse Yeun, Consultant,

Department of Reproductive Medicine, KK Women's and Children's Hospital

Female sexual dysfunction is currently classified by the Diagnostic and Statistical Manual of Mental Disorders, 5th Edition (DSM 5) into three categories – **genito-pelvic pain/penetration disorder (GPP/PD)**, sexual interest/arousal disorder and female orgasmic disorder.

Symptoms are experienced 75% to 100% of the time for at least 6 months and cause significant distress. It should not be due to substance abuse or medications, a psychiatric condition, the consequence of severe relationship distress (e.g., partner violence) or other significant stressors.¹

GENITO-PELVIC PAIN/PENETRATION DISORDER – A TYPE OF FEMALE SEXUAL DYSFUNCTION

GPP/PD was previously termed sexual pain disorder, and was made up of two separate diagnostic entities in DSM 4, namely dyspareunia and vaginismus.

Dyspareunia is defined as persistent or recurrent pain with attempted or complete vagina entry and/or vagina penetration.

Vaginismus is described as persistent or recurrent difficulties to allow vaginal entry of a penis, finger or any object, despite the woman's expressed wish to do so.

In vaginismus, individuals experience fear and anxiety during penetration attempts which cause vagina and pelvic floor muscle contraction, resulting in the experience of genital pain. This pain then results in an increased experience of negative emotions and hypervigilance that perpetuate muscle tension. This leads to a cycle of pain and unsuccessful attempts at penetration, which often ultimately leads to sex avoidance.

The aetiology of GPP/PD is multifactorial (Refer to Table 1), and can be due to physical (Refer to Table 2), psychological, psychosocial, sexual and cultural factors.

Table 1 Aetiology of Genito-pelvic Pain/ Penetration Disorder

SEXUAL PAIN DISORDER		
Biological Issues	Psychosexual	Functional
Infection	Co-morbidity with other female sexual dysfunctions	Hyperactivity of pelvic muscles
Inflammation	Sexual abuse	
Atrophy	Affective disorder	
Congenital anomalia	Catastrophising	
Latrogenic	Somatisation	
Neuropathic pain	Couple-related	
Vascular disease		

Table 2 Physical Conditions Causing Genito-pelvic Pain/Penetration Disorder

PHYSICAL CONDITIONS CAUSING GENITAL SEXUAL PAIN	
Endometriosis	Predominant cause of deep dyspareunia in premenopausal women
Pelvic inflammatory disease	Abdominal adhesions with chronic pain including deep dyspareunia
Estrogen deficiency	Common cause of dyspareunia in postmenopausal women due to vulvovaginal atrophy
Pelvic organ prolapse, urinary incontinence	Do not seem to affect sexual function, but patients should be informed about potential deleterious impacts after surgery
Interstitial cystitis	Commonly reported in patients with dyspareunia
Female genital mutilation	Aside from dyspareunia, other severe adverse effects occur and for many women, lifelong suffering
Gynaecological cancer therapy	Pelvic radiation and chemotherapy causes fibrosis and atrophy of the lower genital tract, hampering lubrication and causing dyspareunia
Cancer chemotherapy	Causes atrophy of the vaginal mucosa; local estrogen therapy is cautioned in women with breast cancer
Graft vs. host reaction	Reported adverse effect in the vagina after systemic immunosuppressive treatment
Malformations	Vaginal septum, congenital abnormalities
Hidradenitis suppurativa	Chronic scarring in severe cases
Uterine fibroid	Pressure and pain in the bladder and intestine, mainly deep dyspareunia
Irritable bowel syndrome	Co-morbid in women with localised provoked vulvodinia
Pelvic radiation	Causes atrophy, agglutination, decreased lubrication, and dryness, superficial as well as deep dyspareunia



INCIDENCE AND PREVALENCE

GPP/PD is under-recognised and under-treated, but a common and distressing complaint that affects women of all age groups.²

Worldwide incidence of GPP/PD is estimated to be highest in women aged 20 to 29 years old, at 22 per 1000 women years. The incidence reduces to 9, 5 and 8 per 1000 women years in the fourth, fifth and sixth decade of life respectively.³

International GPP/PD prevalence rates range from 1% to 20% in adult women. This variability in range may be attributed to age differences among women.⁴

Dyspareunia prevalence ranges from 14% to 34% in younger women and 6.5% to 45% in older women.^{5, 6, 7} Localised provoked vulvodynia is the most common cause of superficial dyspareunia in pre-menopausal women, affecting up to 12% of the fertile population.⁵ Vaginismus prevalence ranges from 1% to 5% in fertile women and may be higher in subfertile populations.^{8, 9}

A survey study of Singaporean women in the tertiary health setting showed that 38.3% experienced sexual problems and 22% reported genital sexual pain.¹⁰

At KK Women's and Children's Hospital, there were 129 new cases of patients with female sexual difficulties who presented to the multidisciplinary sexual health clinic in 2016.

PATIENT PROFILE

Women across all age groups may suffer from GPP/PD. The condition is sub-classified into lifelong or acquired, and generalised or situational.

Acquired GPP/PD can be precipitated by life events such as pregnancy, menopause, infertility and cancer. Pelvic cancer treatment, such as surgery, radiation, and hormones, can cause dyspareunia directly, as well as indirectly, by inducing premature menopause.

GPP/PD is frequently co-morbid with other female sexual dysfunctions, such as reduced sexual interest, orgasm, lubrication and satisfaction (Refer to Table 3).

Women with superficial genital pain (e.g., provoked vulvodynia) have high prevalence of depression and anxiety, and low self and body esteem with specific personality traits, such as neuroticism and harm avoidance.² These intrapersonal characteristics predispose individuals to sexual dysfunction.

Vaginismus patients present with anxiety rather than depression, and exhibit phobic avoidance due to psychosomatic fear of penetration. Associations with a harm avoidance personality trait and catastrophic cognition have been found.²

Fatigue is common in chronic pain patients and can interfere with sexual and non-sexual function.

The male partner's erectile and ejaculatory dysfunction have also been found to be closely-related.² Severe penile curvatures can also cause dyspareunia.

Table 3 Symptoms of Sexual Dysfunctions

TYPE	SYMPTOMS
Introital pain	Poor arousal, mild vaginismus, localised provoked vulvodynia, perineal surgery, pudendal nerve entrapment
Mid-vaginal pain	Levator ani myalgia
Deep vaginal pain	Endometriosis, pelvic inflammatory disease, side effect of pelvic/vaginal radiotherapy, referred abdominal pain
Pain before intercourse	Phobic attitude towards penetration, vulvodynia, vaginismus
Pain during intercourse	All of the above, defensive contraction of the pelvic muscles
Pain after intercourse	Mucosal damage, poor lubrication

HOW SHOULD GENERAL PRACTITIONERS APPROACH FEMALE SEXUAL PAIN?

Sexual health concerns frequently surface in conversations with primary care providers and not specialists. A qualitative study by Brooks et al found that patients with vestibulodynia had seen up to 15 physicians before receiving a diagnosis, which delays treatment by an average of 24 months.¹¹

General practitioners can encourage earlier intervention by questioning all patients about their sexual health concerns.

The **PLISSIT** model provides a concise method for integrating sexual enquiry into a clinical consultation, and can be used by all healthcare professionals:

1. Ask for **permission**: Use of open-ended questions such as "Is there anything about your sexual health you would like to discuss?"
2. Offer **limited information**: Once the patient has identified a concern, the provider can offer targeted information, such as potential causes of the symptoms or clarify misinformation.
3. Give **specific suggestions**: Offer differential diagnosis and give specific suggestions to start addressing the problem.

4. **Intensive intervention:** If necessary, a referral can be made to a sexual health specialist, such as a sex therapist or pelvic floor specialist to provide more comprehensive support and guidance.

If sexual pain has been identified after utilising the PLISSIT model, assessment can proceed in the following manner outlined in *Table 4*.

1. **Specify if symptoms are lifelong or acquired;** localised or generalised, and identify if the pain is situational (e.g., only during partnered sex). Elicit the presence of extra-genital pain. Gynaecological, psychiatric and sexual history are especially important. Medications, such as oral contraceptive pills, have also been associated with genital pain in users.²
2. **Patients with sexual pain, especially vaginismus patients,** are often reluctant to undergo a gynaecological examination, especially during their first visit.

Internal vagina examinations should not proceed against the patient's wishes. In the primary care setting, internal vagina examinations should not be performed on virgins.

However, external genitalia assessment for vulvovaginal atrophy, dermatoses and infections can usually be performed. Extra-genital manifestations of the disease responsible may be found (e.g., oral mucosa lichen planus).

3. **For women of reproductive age,** consider the patient's goals (e.g., trying to conceive or to achieve pain-free intercourse) when making a referral.

Use of the PLISSIT model also helps primary care providers route patients with complex sexual health issues to appropriate specialists, by differentiating between psychological and physical causes of pain or dysfunction.

For instance, a woman with depression may not feel pleasure during masturbation or sex. The PLISSIT model can be used to determine whether her sexual difficulties stem from depression, or a physiological cause such as postpartum pelvic floor dysfunction.

Table 4 Guidelines for Assessment of Sexual Pain

ETIOLOGICAL EVALUATION	
A.	General examination;
B.	Extended examination (by specialist) for genital sexual pain (GSP)
A. General medical and gynaecological examination	
•	General health: other medical conditions, psychiatric/psychological disorders.
•	Gynaecological history: pregnancy, births, menstrual periods, contraception.
•	Sexological history: experiences of different sexual behaviour/patterns (with one or more partners) including masturbation habits, other sexual dysfunction, partner dysfunction, sexual trauma. Lifelong or acquired, general or situational GSP.
•	Pelvic examination: vaginal pH, cotton swab, other additional testing such as cultures when required, evaluation of the pelvic muscles.
•	Pain mapping and pain scale: provoked vs. unprovoked, occurrence of extragenital pain.
B. Extended diagnostic examination; depending upon case history and physical findings	
•	Biopsies: dermatoses, dysplasia
•	Ultrasound: vaginal, abdominal
•	X-ray: lower back, pelvis
•	MRI: lower back, pelvis
•	Laparoscopy: endometriosis and deep dyspareunia

SPECIALIST MANAGEMENT

Patients are usually first referred to gynaecologists or dermatologists for confirmation of a pathological diagnosis, to exclude malignancy, or after first-line treatment has failed.

GPP/PD can be considered a chronic pain condition as symptoms last more than 6 months. It is also frequently co-morbid with psychological disorders such as anxiety and depression, disturbances in other phases of the sexual response and is also associated with sexual dysfunction in the partner.

Therefore, a multi-systemic and multi-disciplinary assessment approach to the assessment and management of genital sex-

ual pain is recommended, focusing on pre-disposing, precipitating and maintaining factors for treatment and relapse prevention.

Couple assessment is recommended as genital sexual pain affects the sexual function of the couple as a whole.

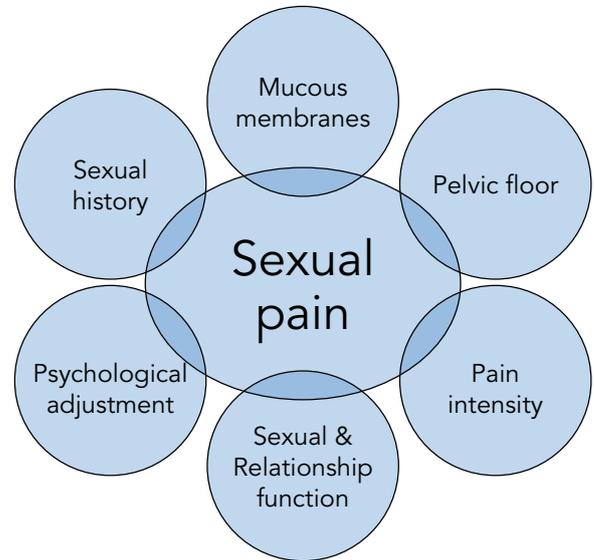
When initiating treatment for sexual pain, Van Lankveld et al has recommended focusing on the following six areas (Refer to Figure 1): mucous membranes, pelvic floor, pain intensity, sexual and relationship function, psychological adjustment and sexual history.¹²



Psychosexual assessment and interventions should be integrated with medical management. The British Society for the Study of Vulval Disease also recommends combination treatment for the management of vulval pain.¹² Not all patients require or are motivated to pursue psychotherapy, but a provision of brief sexual counselling sessions are still helpful for most couples for education and support. Cognitive-behavioural therapy has been found to be effective for vulvodynia.¹³

Pelvic floor assessment by a physiotherapist experienced in pelvic floor dysfunction is important, as women with chronic sexual pain commonly have reduced pelvic floor function and increased tension. Pelvic floor rehabilitation is part of multi-systemic treatment for GPP/PD and can be performed using physical therapy or electromyography biofeedback.

Figure 1 Six areas of focus for the treatment of sexual pain



CASE STUDY

A female patient in her late 20s and her husband in his 30s were referred to the subfertility clinic (at KKH) for dyspareunia. The couple had requested for in-vitro fertilisation (IVF) as they had been trying to conceive since getting married a few years ago. Joint consultation was held and sexual history revealed the patient had no prior experience of vagina insertion during masturbation, nor previous tampon use. The couple were each other's first sexual partners and had no pre-marital sexual activity.



Since marriage, sex had never been successful as the patient always felt a sharp pain on attempted penetration, and was worried that this could be due to her hymen tearing. She had consulted a gynaecologist previously, but was not able to tolerate a speculum examination. Local anaesthetic gel was prescribed for her use when needed, and she was encouraged to try to relax and continue attempting intercourse. Attempts at arousal failed to overcome the problem.

Over time, attempts at intimacy dwindled and her husband developed difficulty in maintaining his erection. He consulted an urologist and was prescribed, but it did not lead to successful consummation of marriage. During a subfertility clinic session, the patient exhibited physical symptoms of heightened anxiety during physical examination and hence, an internal vagina examination was not performed.

In this case study, anatomical and other biological causes of pain were needed to be ruled out before attributing pain to vaginismus. Even though an internal examination was not per-

formed, congenital causes such as an imperforate hymen can be detected by gentle traction of buttocks downwards to inspect the introitus. Internal pelvic examination is not mandatory for vaginismus patients prior to treatment, but may be an end point of therapy. It is important to note that many vaginismus patients are still virgins and a thorough explanation of what is involved in an internal pelvic examination and its possible implications (torn hymen) should be undertaken, and consent should be documented.

The male partner's sexual difficulties can be the cause or the result of female dysfunction. For vaginismus patients, partners frequently complain of difficulty maintaining erections. However, taking phosphodiesterase type 5 inhibitors does not help partners of vaginismus patients achieve penetration and may in fact worsen sexual pain. Relationship factors are important in sexual pain disorders and couple therapy may be required.

In Singapore, sexual naivety is often seen in vaginismus patients, and vaginismus treatment should include

education on sexual response and an understanding of genitalia structures. A combination of approaches, including progressive digital/dilator desensitisation, Kegel's exercises and cognitive-behavioural therapy are commonly utilised.

Women who experience painful sex are likely to suffer from impaired libido and arousal, as described earlier. Therefore, concentrating more on foreplay and non-penetrative forms of sexual pleasuring can increase enjoyment and reduce pain. Sensate focus

may be beneficial. Avoidance of penetration is also recommended during treatment to break the cycle of pain.

IVF is often viewed as a "quick-fix" to conception for couples who are trying to conceive. However, for young couples who are unable to consummate the marriage due to vaginismus, with no obvious subfertility factors, it may be reasonable to start with working towards the goal of pain-free sex first; or at least to aim for tolerance of internal medical examinations required for subfertility work-up and treatment.



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Dr Tan Tse Yeun is a Consultant at the Department of Reproductive Medicine at KK Women's and Children's Hospital, and is an accredited IVF Specialist and a Fellow of the European Committee of Sexual Medicine.

Dr Tan is also a clinical lecturer at the Yong Loo Lin School of Medicine, a clinical faculty member of the Lee Kong Chian School of Medicine, and an adjunct instructor at the Duke-NUS Medical School.

GPs can call for appointments through the KKH Central Appointments Hotline at 6294 4050 or scan the QR code for more information.



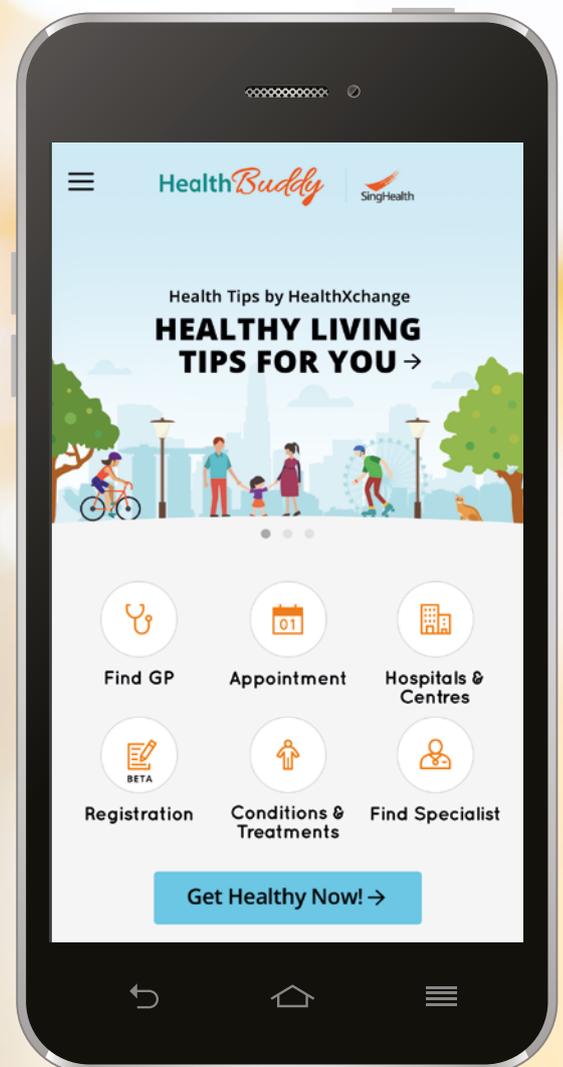


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New Clinic for Couples with Recurrent Pregnancy Loss

Recurrent pregnancy loss affects approximately 1% of couples trying to conceive. KK Women's and Children's Hospital's (KKH) dedicated **Recurrent Pregnancy Loss (RPL) Clinic** provides comprehensive assessment, treatment recommendations and psycho-social counselling for affected couples.

WHAT IS RECURRENT PREGNANCY LOSS?

Recurrent pregnancy loss is defined as the loss of three or more pregnancies, and can be associated with a diverse range of causes such as endocrine problems like thyroid disease, abnormalities of the uterus, chromosomal aberrations and antiphospholipid syndrome.

Common causes of recurrent pregnancy loss seen by KKH include Asherman's Syndrome (scarring of the uterus lining), fibroids, obesity and smoking.

Due to the complexity of the condition, more than 50% of affected couples may not have the cause of their recurrent pregnancy loss definitively identified, despite extensive investigations.

In addition, prolonged loss and grief can be highly stressful, and couples experiencing recurrent pregnancy loss may refrain from open discussion and avoid seeking support from friends and family, out of fear of the perceived stigma surrounding miscarriage.

"Whilst challenging to treat, there is growing evidence that the management of recurrent pregnancy loss by dedicated

clinics can provide excellent prognoses for future pregnancy outcomes among affected patients," shares Dr Liu Shuling, Consultant, Department of Reproductive Medicine, KKH, who leads the Recurrent Pregnancy Loss Clinic.

A PLACE OF CARE AND SUPPORT

Many conditions leading to recurrent pregnancy loss and their treatment options overlap with care plans for subfertility in couples. Assisted reproductive techniques with in-vitro fertilisation and pre-implantation genetic diagnosis or pre-implantation genetic screening may also be required for these couples.

The **KKH Recurrent Pregnancy Loss Clinic** is the first in Singapore to be run by specialists in reproductive medicine who are:

- Experienced in the management of subfertility
- With the capacity to refer patients for additional help from medical social workers, psychologists, immunologists and endocrinologists, when necessary.

Drawing on the expertise of various medical and allied health specialties, KKH is able to provide holistic care for couples with a variety of medical conditions, and be a place of support for them.

"If a couple wishes to and is ready to try for a child again, we will support them through exploring treatment options that are available to prepare them for the next pregnancy," says Dr Liu.

REFER A PATIENT

Community healthcare practitioners and polyclinics can contact KKH at **+65 6294 4050** to refer a patient directly to the **Recurrent Pregnancy Loss (RPL) Clinic** if the patient:

- Has experienced 3 or more previous miscarriages;
- Is currently not pregnant; and
- Is keen for another pregnancy





Urgent O&G Centre at KKH

The **Urgent O&G Centre (UOGC)** at KK Women's and Children's Hospital is a 24-hour walk-in centre for women with Obstetric and Gynaecological (O&G) conditions requiring immediate attention.

The Urgent O&G Centre (UOGC) is Singapore's referral centre of choice, where patients present with a variety of conditions, including early pregnancy, post-partum, menstrual, urogynaecological, breast and gynaecological disorders. An average of 2,210 patients is seen each month.

Previously known as the O&G (24-hour) Clinic, the renaming to Urgent O&G Centre emphasises the facility's focus on managing acute O&G-related issues and dovetails with enhancements to patient care:

1. Round-the-clock Availability of Specialists

Consultants or Associate Consultants are present at all times to provide supervisory support to the care team.

2. Adoption of Modified Patient Acuity Category Triage System

Under the Modified Patient Acuity Category triage system, all patients are initially triaged by trained nurses into P1/P2/P3 categories by a set of criteria. This allows for acute conditions in the P1 and P2 categories to be attended to in a timelier manner.

To allow for priority critical patients, special personnel are also appointed to screen and re-triage patients in the waiting area as necessary, as conditions may evolve to become more acute.

Patients with non-OG conditions, if stable, will be given a choice to be referred to other hospitals better-equipped to provide them with specialised care for their medical conditions.

3. New Facilities

- The UOGC has adopted the *Clindoc* clinical documentation system, in line with the Specialist Out-patient Clinics. Major renovations are under way to improve its facilities, including the waiting area and consultation rooms, in order to render a better environment for both doctors and patients.
- The manual triage system has been replaced with a computerised dashboard. Streamlined patient management allows for a more accurate estimation of waiting time, and provides automatic prompts to ensure that all patients receive care in a timely manner and appropriate to their condition.
- Additional consult rooms will help meet waiting time targets and enable a better flow of patients in the centre.

4. Academic Medical Centre activities in the Urgent O&G Centre

The UOGC aims to support the academic centre to promote research and help patients gain access to evidence-based care. Aside from providing clinical services, the UOGC is at the forefront of recruiting patients for various research projects, focusing on developing new diagnostic point-of-care tests and improving urgent care responses.

Work on a Spot Serum Progesterone test, led by Associate Professor Tan Thiam Chye, resulted in a new protocol for the assessment and management of threatened miscarriages in spontaneous pregnancies. This assists the doctors in decision-making, while determining the optimal dosage of pregnancy hormone supplementation in patients presenting with bleeding, which is common during early pregnancy.

Since February 2018, Advanced Practice Nurses (APN) have been attached to the UOGC as part of their accreditation to manage common O&G conditions. The aim is to empower APNs to be pillars of the UOGC, to provide extra support in the clinic and enhance services.

A CORPUS (Course for O&G/Radiologists in Pelvic Ultrasonography) workshop was conducted in May 2018 to train and certify O&G and Radiology trainees to perform early pregnancy scans required to assess common gynaecological conditions such as fibroids and ovarian cysts. The workshop was well-received by attendees.

Looking ahead, the UOGC will continue to review and incorporate up-to-date protocols for common O&G conditions to enhance the management of patients.

In aligning with the hospital's philosophy of patient-centered care, the UOGC's multifaceted enhancements aim to improve care, safety and experience for patients.



AS A 24-HOUR WALK-IN CENTRE FOR WOMEN WITH URGENT O&G CONDITIONS, THE URGENT O&G CENTRE PROVIDES A COMPREHENSIVE RANGE OF SERVICES.

- **Acute unstable patients**

A specialised area in the UOGC with emergency resuscitation and monitoring equipment caters for patients with significantly abnormal vital signs, who are in critical condition and deemed to be unstable.

Such patients (Triage category P1) will be attended to immediately by registrars and specialists. There is an emergency delivery facility for patients who cannot be transported to the Delivery Suite in time. CODE Blue/Red can be activated from the clinic in case of collapsed patients.

- **Early pregnancy services**

The UOGC will attend to patients who are experiencing bleeding, pain or severe nausea and vomiting in pregnancy (less than 22 weeks' gestation). Scans are offered by doctors trained to ascertain the location of the pregnancy, and to assess gestational age as well as viability (in order to exclude ectopic pregnancy).

The UOGC has two state-of-the-art ultrasonography machines with excellent resolution, to better aid doctors in management of early pregnancies. In collaboration with the Department of Diagnostic and Interventional Imaging, sonographers will provide expertise and perform urgent scans for unstable patients.

Counselling for pregnancy complications such as miscarriages, ectopic and other abnormal pregnancies is also provided. Point-of-care pregnancy blood tests are performed at the clinic and reviewed promptly by on-site doctors to determine further management for patients. Expectant mothers at 22 weeks gestation or more, will continue to be attended to at the Delivery Suite on Level 2, Women's Tower.

- **Acute gynaecological conditions**

Patients with severe vaginal bleeding or lower abdominal/pelvic pain will be initially evaluated at the UOGC, and emergency treatment instituted to resolve symptoms as necessary.

Vaginal swabs, biopsies and other diagnostic tests may be performed at the UOGC, if urgently needed, and the management of patients continued at the Specialist Outpatient Clinics as necessary. Again, pelvic imaging is readily available if the need arises.

- **Post-pregnancy related conditions**

The UOGC manages patients with breastfeeding issues and other postpartum conditions, such as excessive bleeding, pain or wound complications. 24-hour Lactation Consultant services are available at the clinic.

Fast-track referrals to the Breast Clinic for urgent breast conditions, such as breast abscess, are also available. Patients who are emotionally labile may also be admitted with suicide cautions, for review by the Mental Wellness Service team.

- **Post-operative complications**

The UOGC is the main portal of follow-up for patients who are experiencing unexpected symptoms after an operation in KKH. These can range from more acute conditions, such as severe bleeding or pain, to less critical ones, such as a urinary tract infection or mild wound infection. Such a service is especially important for the hospital in promoting patients' safety and trust in our care.

- **Sexual assault**

The UOGC tends to victims of alleged sexual assault on both an emergency and appointment basis. Younger victims will be admitted to the Children's wards through the *KKH Children's Emergency* and then attended to by doctors from the UOGC.

Not only do we play an essential role in providing medical expertise to evaluate victims for physical injury and prevent sexually transmitted infections, our influence on their psychological recovery as impartial and sensitive first-responders to their trauma cannot be overlooked.

- **Isolation cases for infection control**

The UOGC attends to pregnant patients, who have been exposed to or have symptoms suggestive of potentially infectious diseases such as chickenpox, in isolation, in order to reduce risk to the many other pregnant patients in the hospital.

These groups of patients are screened and triaged by trained nurses, who then immediately assign them to an isolation area to await consultation by the doctors. Opinions from Infectious Disease specialists can be sought for complex cases. The UOGC was quick to implement a Zika Virus protocol, in collaboration with the Department of Maternal Fetal Medicine.

Urgent O&G Centre

KK Women's and Children's Hospital
Women's Tower, Basement 1

For any enquiries, please contact the Urgent
O&G Centre at **6394 1904 / 8121 1901**.



Lung Transplant Programme at National Heart Centre Singapore



WHAT IS LUNG TRANSPLANTATION?

Lung Transplantation is a surgical procedure in which the failing lung of a patient with advanced lung disease is replaced with a healthy lung from a recently deceased, brain-dead donor. In rare cases, part of a lung can be taken from a living person for lung transplantation.

WHO CAN BENEFIT FROM LUNG TRANSPLANTATION?

Patients are considered potential candidates for lung transplantation if they have severe, symptomatic and progressive lung disease that is refractory to conventional therapy, with an estimated life expectancy of less than 18 months despite optimal medical therapy.

Common causes of advanced lung disease in Singapore include:

- Chronic obstructive pulmonary disease/emphysema
- Interstitial lung disease (e.g. idiopathic pulmonary fibrosis - refer to Figure 1)

- Bronchiectasis
- Pulmonary hypertension (primary and secondary)

Following a successful lung transplantation, these patients can expect to have an improved quality of life and increased long-term survival.

Due to breathing difficulties, pre-lung transplant patients often have severe limitations in their activities of daily living, and they are also frequently admitted into the hospital for exacerbations of their underlying lung disease.

After lung transplantation, these patients are able to return to their normal lives. They are able to exercise, work and travel after a period of recovery from their operation, without many of the previous restrictions.

Worldwide, the one-year survival rate post-transplantation is 80% to 90%, and the five-year survival rate post-transplant is over 50%. These figures have improved over the years and the out-

look is expected to improve further with advances in lung transplantation.

EVALUATION FOR LUNG TRANSPLANTATION

Our multidisciplinary team of pulmonologists, thoracic surgeons, clinical coordinators, psychiatrists, dieticians, physiotherapists and medical social workers will meet each referred patient and review his or her medical records to determine the suitability for lung transplantation.

If the patient is found to be a suitable transplant recipient, a comprehensive pre-transplantation work-up consisting of blood, sputum and urine tests, chest X-ray, Computed Tomography (CT) scans, bone mineral densitometry, radionuclide studies, lung function testing, echocardiogram, as well as cardiac catheterisation, will be performed.

Following the evaluation, if the patient meets all the qualifying criteria for lung transplantation, he or she will be placed on a waiting list for the transplant. If a suitable donor is found, the patient will

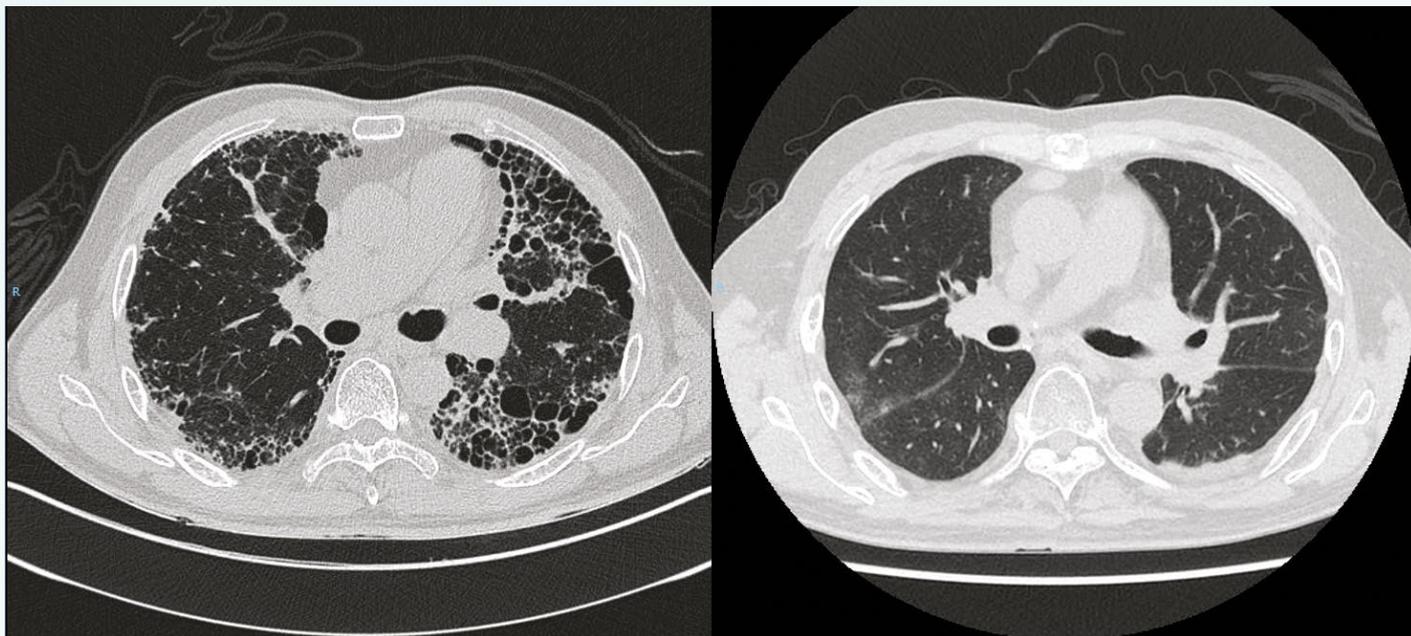


Figure 1 CT thorax of a patient with underlying idiopathic pulmonary fibrosis pre (left) and post (right) lung transplantation

undergo the transplant operation to have either one (single lung transplantation) or both (bilateral lung transplantation) lungs replaced.

LUNG TRANSPLANTATION IN SINGAPORE

National Heart Centre Singapore (NHCS) is the only institution in Singapore that performs lung transplantation.

A total of 13 lung transplants have been done since the inception of the lung transplantation programme in 2000.

Most of the transplants were carried out for patients with chronic obstructive pulmonary disease (54%) or interstitial lung disease (38%).

NHCS's clinical outcomes for lung transplant recipients are comparable with those reported internationally, with a one-year survival rate of 83.3% and a five-year survival rate of 50% for the period of 2006 to 2016.

However, the average waiting time on the waiting list was 447 days, as there

is generally a low consent rate for lung donation.

Lung donation is not covered by the Human Organ Transplant Act (HOTA), unlike the cornea, kidneys, liver and heart. Thus, if the deceased donor had not given his or her consent to donate his or her lungs, or other organs, prior to his or her demise, or there was no consent from the relatives after the declaration of the donor's brain death, the lung or other organs cannot be recovered for the purpose of transplantation.

How do I refer a patient for consideration for lung transplantation?

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

Clinical Coordinator
 Mechanical Circulatory Support, Heart and Lung Transplant Unit
 National Heart Centre Singapore
 5 Hospital Drive
 Singapore 169609
 Tel: 6704 8130
 Email: transplant.office@nhcs.com.sg



OUR LUNG TRANSPLANT PROGRAMME TEAM

SURGEONS

National Heart Centre Singapore

Dept of Cardiothoracic Surgery

Dr Ong Boon Hean
Acting Director
Lung Transplant Programme
Consultant

Dr Kang Ning
Associate Consultant

Dr Soo Ing Xiang
Associate Consultant

Dr Koh Puay Theng Tina
Visiting Consultant

Dr Lim Chong Hee
Visiting Consultant

Dr C. Sivathanan
Visiting Consultant

ANAESTHETISTS

National Heart Centre Singapore

Dept of Cardiothoracic Anaesthesia

Dr Kenny Loh Wei Tsen
Head & Visiting Consultant

Assoc Prof Goh Meng Huat
Visiting Consultant

Dr Harikrishnan Kothandan
Visiting Consultant

Assoc Prof Ruban Poopalalingam
Visiting Consultant

Dr Shah Shitalkumar Sharad
Visiting Consultant

Dr Teo Yee Wei
Visiting Consultant

PHYSICIANS

Singapore General Hospital

Dept of Respiratory & Critical Care Medicine

Dr Phua Ghee Chee
Head & Senior Consultant

Dr Sewa Duu Wen
Consultant

Dept of Infectious Diseases

Assoc Prof Tan Thuan Tong
Head & Senior Consultant

Assoc Prof Tan Ban Hock
Senior Consultant

Dr Chung Shimin Jasmine
Consultant

National Heart Centre Singapore

Dept of Cardiothoracic Surgery

Dr Chai Gin Tsen
Visiting Consultant

Dr Jagadesan Raghuram
Visiting Consultant

NURSES

Singapore General Hospital

Ms Tan Sok Boey
Nurse Clinician
Division of Surgery,
Operating Theatres

National Heart Centre Singapore

Ms Chong Thye
Assistant Director, Nursing
Cardiovascular Rehabilitation Unit

Mr Alias Bin Osman
Nurse Clinician
Ward 56

Ms Ng Sok Guek
Assistant Nurse Clinician
Cardiothoracic Surgery Intensive
Care Unit (CTICU)

ALLIED HEALTH PROFESSIONALS

Singapore General Hospital

Mr Tan Lee Boo
Senior Principal Dietitian
Dietetics

Ms Low Wai Yan
Principal Physiotherapist
Dept of Physiotherapy

National Heart Centre Singapore

Mr Chen Hebin
Senior Physiotherapist
Cardiac Physiotherapy Services

Ms Lim Simin
Medical Social Worker
Medical Social Services

Ms Chng Bee Ling Kelly
Pharmacy Practice Manager
Pharmacy

COORDINATORS

National Heart Centre Singapore

Mechanical Circulatory Support,
Heart & Lung Transplant Unit

Ms Kerk Ka Lee
Senior Manager

Ms Neo Chia Lee Sharon
Principal Clinical Coordinator

Ms Tay Hwee Ming Jael
Principal Clinical Coordinator

Ms Tan Lili Joycelyn
Senior Clinical Coordinator

Ms Leam Lirong June
Clinical Coordinator

Singapore Integrated Diabetic Retinopathy Programme (SiDRP)

by SNEC Ocular Reading Centre

Diabetic Retinopathy (DR) is a disorder of the blood vessels in the retina of patients with diabetes mellitus. It is the leading cause of new blindness in working adults in developed countries, including Singapore.

DR first manifests itself slowly over the years as *background retinopathy*, which is the early stage of DR. At this early stage, tiny blood spots or fatty deposits appear on the retina.

Proliferative retinopathy develops from *background retinopathy* and is responsible for most of the visual loss in diabet-

ics. In this condition, new blood vessels grow on the surface of the retina and optic nerve. These immature blood vessels tend to rupture and bleed into the cavity of the eye.

Scar tissue can also form from the ruptured blood vessels and can contract and pull on the retina, causing retinal detachment and vision loss. In some cases, new vessels can grow on the iris and cause a form of glaucoma, which itself can lead to blindness.



The Singapore Integrated Diabetic Retinopathy Programme is offered by the SNEC Ocular Reading Centre (SORC) to conduct eye screening of diabetic patients. To date, SORC has assessed more than 150,000 eye screenings from diabetic patients in more than 20 centres islandwide, under SiDRP.

The SiDRP is based on a 'real time' assessment of DR, from photographs by a centralised team of accredited trained readers, supported by a tele-ophthalmology IT infrastructure.

Two-field images are taken using a retina camera and sent to the reading centre. The images are reviewed by trained readers, who generate the reports within a day (often within the hour).

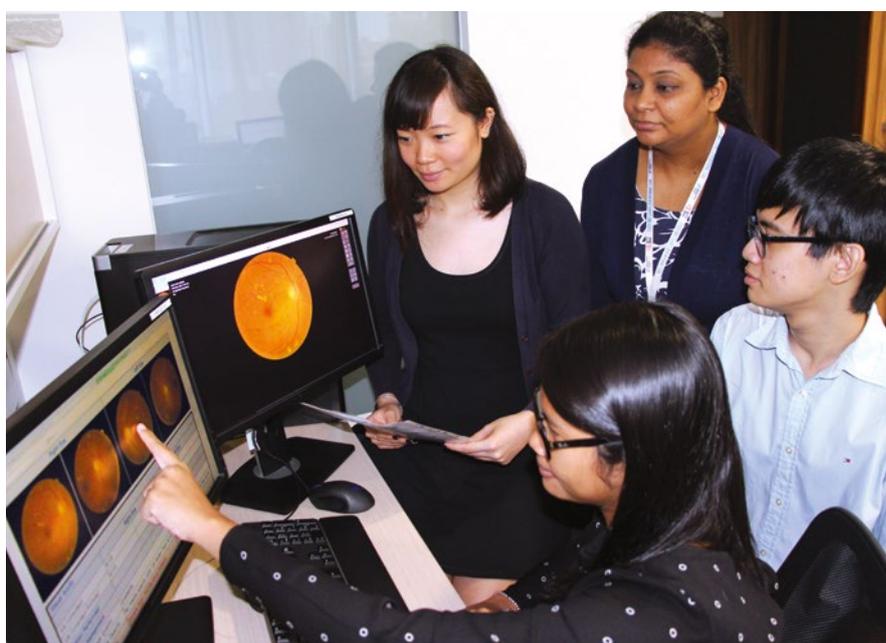
The reports are sent to the patient's doctor, who will refer the patient to an ophthalmologist, if necessary. Audit checks are conducted regularly, and our recent results showed > 90% sensitivity and specificity, when measured against an ophthalmologist.

The improvements to the traditional DR screening process include better accuracy in reporting¹, increase in patient satisfaction due to shorter turnaround time to receive a report, and that doctors can now spend more time on the management and care of the patient.

Our recent cost-effectiveness study² also found that the cost-savings attributed by using an SiDRP model

is estimated to be \$144 per person. Extrapolating to the entire polyclinic diabetic population, the savings would be \$29.4 million over a lifetime horizon.

Our clients include GP clinics, SingHealth Polyclinics, Family Medicine Centres (FMC), Community Health Centres (CHC), hospitals, health screening centres, VWOs, and optical shops.





Services



SNEC OCULAR READING CENTRE

The SNEC Ocular Reading Centre (SORC), established in 2006, provides evaluation and interpretation (grading) services of ocular pathology from fundus photographs, fluorescein angiograms, Optical Coherence Tomography (OCT) scans or other imaging modalities, using advanced and standardised grading protocols.

Started as a research unit, SORC has evolved into a clinical service and serves as a tele-ophthalmic ocular reading centre. It is a hub that ensures effective and prompt service delivery by streamlining and automating the entire process; from image capture on site, to the electronic transfer of the image via a dedicated conduit to the reading centre.

In July 2010, the Singapore Integrated Diabetic Retinopathy Programme (SiDRP) was rolled-out with aims to improve on the traditional Diabetic Retinopathy (DR) screening, where patients with diabetes undergo annual retinal photography for an assessment of DR, using a non-standardised protocol by family physicians with a turnaround time for reports that took 2 - 3 weeks.

For more information, please contact:

SNEC Ocular Reading Centre

Ms Soundaram Jaganathan

Assistant Manager

Tel: 6576 7212

Email: soundaram.jaganathan@sneec.com.sg

Website: <https://www.sneec.com.sg/clinicalservices/Pages/SNECOcularReadingCentre.aspx>

REFERENCES:

1. Bhargava M, Cheung CY, Sabanayagam C, et al. Accuracy of diabetic retinopathy screening by trained non-physician graders using non-mydratricfundus camera. Singapore Med J. 2012;53(11):715-719.
2. Nguyen HV, Tan GS, Tapp RJ, et al. Cost-effectiveness of a national telemedicine diabetic retinopathy screening programme in Singapore. Ophthalmology. 2016;123(12):2571-2580



SINGAPORE GENERAL HOSPITAL

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

APPOINTMENTS



Dr Tracy Loh Jiezhen
Associate Consultant
Dept
Anatomical Pathology



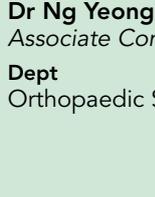
Dr Tang Po Yin
Associate Consultant
Dept
Anatomical Pathology



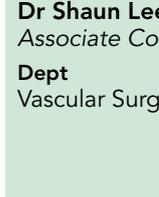
Dr Wan Paul Weng
Associate Consultant
Dept
Emergency Medicine



Dr Nur Diana Binte Zakaria
Associate Consultant
Dept
Emergency Medicine



Dr Ng Yeong Huei
Associate Consultant
Dept
Orthopaedic Surgery



Dr Shaun Lee Qingwei
Associate Consultant
Dept
Vascular Surgery

PROMOTIONS - CONSULTANTS



Dr Lim Wei-Min Jason
Consultant
Dept
Colorectal Surgery



Dr Chan Jing Jing
Consultant
Dept
Emergency Medicine



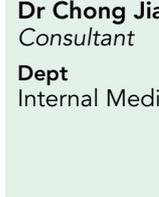
Dr Shen Yuzeng
Consultant
Dept
Emergency Medicine



Dr Lim Weiying
Consultant
Dept
Endocrinology



Dr Chen Yunxin
Consultant
Dept
Haematology



Dr Chong Jiamin Chiara
Consultant
Dept
Internal Medicine



Dr Shalini Sri Kumaran
Consultant
Dept
Internal Medicine



Dr Krithikaa D/O Nadarajan
Consultant
Dept
Internal Medicine



Dr Khor Yiu Ming
Consultant
Dept
Nuclear Medicine & Molecular Imaging



Dr Henry Soeharno
Consultant
Dept
Orthopaedic Surgery
Sub-specialty
Musculoskeletal Tumour Service



Dr Ooi Seng Huan Adrian
Consultant
Dept
Plastic, Reconstructive & Aesthetic Surgery
Sub-specialty
Aesthetic Surgery, Reconstructive Surgery, Burns & Lymphedema, Microsurgery & Skin Cancer



Dr Tan Woon Woon Pearlle
Consultant
Dept
Plastic, Reconstructive & Aesthetic Surgery
Sub-specialty
Craniomaxillofacial Surgery, Reconstructive Surgery, Burns, Cosmetic Surgery, Aesthetic & Lasers



Appointments

SINGAPORE GENERAL HOSPITAL

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

PROMOTIONS - CONSULTANTS



Dr Gudi Alakananda Mihir
Consultant
Dept
Psychiatry



Dr Poon Shi Hui
Consultant
Dept
Psychiatry



Dr Kwek Jia Liang
Consultant
Dept
Renal Medicine
Sub-specialty
General Nephrology



Dr Teo Su Hooi
Consultant
Dept
Renal Medicine
Sub-specialty
General Nephrology



Dr Cassandra Hong Fong Yi
Consultant
Dept
Rheumatology & Immunology
Sub-specialty
General Rheumatology, Musculoskeletal Ultrasound & Connective Tissue Diseases

PROMOTIONS - ASSOCIATE CONSULTANTS



Dr Chan Qiu Hua Catherine
Associate Consultant
Dept
Family Medicine & Continuing Care



Dr Loo Yu Xian
Associate Consultant
Dept
Family Medicine & Continuing Care



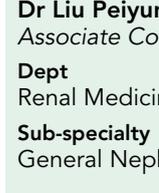
Dr Lim Sue Zann
Associate Consultant
Dept
General Surgery



Dr Teo Chi Yuan Esmeralda
Associate Consultant
Dept
Haematology



Dr Shaun Loh Ray Han
Associate Consultant
Dept
Otolaryngology
Sub-specialty
Obstructive Sleep Apnoea Surgery



Dr Liu Peiyun
Associate Consultant
Dept
Renal Medicine
Sub-specialty
General Nephrology



Dr Carrie Leong Kah-Lai
Associate Consultant
Dept
Respiratory & Critical Care Medicine



Dr Tiew Pei Yee
Associate Consultant
Dept
Respiratory & Critical Care Medicine

NEW APPOINTMENT



Dr Low Lian Leng
Consultant;
Director, SingHealth Office of Regional Health (SGH Campus)
Dept
Family Medicine & Continuing Care

CHANGI GENERAL HOSPITAL

Appointments: 6850 3333

APPOINTMENT - CONSULTANT



**Dr Chien Mei Fong
Jaime**
Consultant
Dept
Infectious Diseases

APPOINTMENTS - ASSOCIATE CONSULTANTS



**Dr Moo Xin Ying
Daphne**
Associate Consultant
Dept
Anaesthesia &
Surgical Intensive Care



Dr Ong Ee Teng
Associate Consultant
Dept
Anaesthesia &
Surgical Intensive Care



Dr Huang Weiliang
Associate Consultant
Dept
Cardiology

SENGKANG HEALTH

Appointments: 6472 2000
Email: ah.appointment@skh.com.sg

APPOINTMENTS - SENIOR CONSULTANTS



**Dr Seow Ying Ying
Terina**
Senior Consultant
Dept
General Medicine,
Renal Medicine



Dr Yeoh Lee Ying
Senior Consultant
Dept
General Medicine, Renal Medicine

APPOINTMENTS - CONSULTANTS



Dr Lin Cui Li
Consultant
Dept
General Medicine,
Gastroenterology



Dr Aaron Woo Shu Jen
Consultant
Dept
General Medicine,
Gastroenterology

KK WOMEN'S AND CHILDREN'S HOSPITAL

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

APPOINTMENT - CONSULTANT



Dr Gan Yiping Emily
Consultant
Dermatology Service



Appointments

KK WOMEN'S AND CHILDREN'S HOSPITAL

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

APPOINTMENTS - ASSOCIATE CONSULTANTS



Dr Nur Adila Binte Ahmad Hatib
Associate Consultant
General Paediatrics Service



Dr Loo Kai Guo Benny
Associate Consultant
General Paediatrics Service



Dr Li Jiahui
Associate Consultant
Infectious Disease Service



Dr Siak Junpei Elizabeth
Associate Consultant
Dept
Psychological Medicine



Dr Chan Ju In Jason
Associate Consultant
Dept
Women's Anaesthesia

NEW APPOINTMENTS



Prof Chay Oh Moh
Emeritus Consultant



Dr Ng Yong Hong
Academic Vice Chair, Clinical (Paediatrics Academic Clinical Programme)
Dept
Paediatrics



Dr Ong Lin Yin
Head
Dept
Paediatric Surgery



Dr Manisha Mathur
Head
Ambulatory Service,
Dept of Obstetrics & Gynaecology



Dr Suzanna Bte Sulaiman
Head
Inpatient Service,
Dept of Obstetrics & Gynaecology

NATIONAL CANCER CENTRE SINGAPORE

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

APPOINTMENT



Dr Tanujaa D/O Rajasekaran
Associate Consultant
Medical Oncology

NATIONAL CANCER CENTRE SINGAPORE

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

NEW APPOINTMENTS



Dr Joseph Wee Tien Seng
Senior Consultant; Director, Special Projects
Division of Radiation Oncology



Assoc Prof Narayanan Gopalakrishna Iyer
Senior Consultant;
Head, Division of Medical Sciences &
Head, SingHealth Duke-NUS Head & Neck
Centre
Division of Surgical Oncology

NATIONAL HEART CENTRE SINGAPORE

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

PROMOTION



Dr Ruan Wen
Consultant
Dept
Cardiology
Sub-specialty
Echocardiography &
Pulmonary Hypertension

NATIONAL NEUROSCIENCE INSTITUTE

Appointments: 6357 7095
Email: appointments@nni.com.sg

APPOINTMENTS - ASSOCIATE CONSULTANTS

Dr Koh Pei Xuan
Associate Consultant
Dept
Neurology
(TTSH Campus)

Dr Zhao Yi Jing
Associate Consultant
Dept
Neurology
(SGH Campus)

NEW APPOINTMENTS



Assoc Prof Deidre Anne De Silva
Head & Senior
Consultant, Neurology
Dept
Neurology
(SGH Campus)



Assoc Prof Nigel Tan Choon Kiat
Senior Consultant;
Deputy Group
Director, Education
(Undergraduate)
Dept
Neurology
(TTSH Campus)



Prof Tan Eng King
Senior Consultant;
Director, Research &
Deputy Medical Director,
Academic Affairs
Dept
Neurology
(SGH Campus)
Sub-specialty
Parkinson Disease,
Movement Disorders &
Neuro-genetics



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

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 MN1804.



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 3 Hospitals, 5 National Specialty Centres, 9 Polyclinics and Bright Vision Community Hospital, it delivers comprehensive, multidisciplinary and integrated care.

In 2018, SingHealth welcomes the assimilation of the Changi General Hospital in the provision of seamless patient care in the eastern region of Singapore.

The Sengkang General Hospital and the Sengkang Community Hospital will also be completed to better serve the north-eastern community.

To enhance community care, the new Outram Community Hospital on the SGH Campus will be completed in 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-opportunities.aspx
Email: careers.medical@sgh.com.sg

■ KK Women's and Children's Hospital

Department seeking Resident Physicians and Staff Registrars:

- Emergency Medicine

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

■ Sengkang Health Departments seeking Resident Physicians and Staff Registrars:

- Anaesthesiology
- Cardiology
- Family Medicine
- General 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 Service
- Urology Service

Website: www.ah.com.sg
Career Portal: www.ah.com.sg/jobseekers/Pages/JoinUs.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 Department seeking Resident Physicians:

- Neurology

Departments seeking Resident Physicians and Service Registrars:

- Neuroradiology
- Neurosurgery

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

■ Singapore National Eye Centre Departments seeking:

- Resident Physicians, Ophthalmology
- Medical Officers

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)

Departments seeking:

- Staff Registrars / Resident Physicians (Family Medicine)

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



NNI Neuroscience Seminar for Family Physicians - Neuromuscular Disorders and Neuropathic Pain

Date 4 August 2018, Saturday	Time 1 pm - 3:45 pm	Fee Free
Venue National Neuroscience Institute, Exhibition Hall, Basement 1		CME Points Accreditation 2 points

The seminar aims to provide General Practitioners with practical skills and an updated knowledge of evidence-based, cost-effective treatment for common neurological disorders seen at their clinics.

At the end of the seminar, the participants should be able to achieve the following:

- Formulate an approach for the diagnosis of neuromuscular weakness and numbness
- Describe the pathogenesis and clinical features of neuropathic pain
- Discuss the diagnosis, prognosis and management of Bell's palsy, carpal tunnel syndrome, cervical and lumbosacral radiculopathies, peroneal nerve palsy, and meralgia paresthetica
- Review the different classes of medications for treatment of neuropathic pain
- Prescribe treatment for neuropathic pain, according to the different mechanisms of the pain



REGISTRATION REQUIRED BY 1 AUGUST 2018

For enquiries, please email nni_secretariat@nni.com.sg or call **6357 7152**



Courses

GP Forum

Women's Dermatology Forum

Common Conditions seen in Women's Dermatology Clinic

Date: 1 September 2018, Saturday

Time: 12.30pm – 5.00pm

Fee: \$12 per pax

Venue: KKH Auditorium
Training Centre
Women's Tower, Level 1



CME points will be accredited

12.30pm	Registration and Lunch
1.30pm	Welcome Address Adj Assoc Prof Mark Koh, Head and Senior Consultant Dermatology Service, KKH
1.35pm	Slide Quiz 1

PART 1: DERMATOSES THROUGH THE AGES

1.45pm	Common Dermatoses in Adolescence Dr Uma Alagappan, Consultant Dermatology Service, KKH
2.10pm	Pregnancy Dermatoses Dr Lynette Lee, Resident Physician Dermatology Service, KKH
2.35pm	Common Dermatoses in Menopause (Including eczema, hair loss, urticaria, pigmentation) Dr Emily Gan, Consultant Dermatology Service, KKH
3.00pm	Tea Break

PART 2: VULVAL DISORDERS

3.30pm	Inflammatory Disorders in the Vulva Dr Colin Tan, Medical Officer, Dermatology Service, KKH
3.55pm	Tumours in the Vulva Dr Namuduri Ramapadmavathi Devi, Staff Physician Department of Gynaecological Oncology, KKH
4.20pm	Sexually Transmitted Diseases Adj Assoc Prof Mark Koh, Head and Senior Consultant Dermatology Service, KKH
4.45pm	Slide Quiz (Answers)
5.00pm	End of Programme

REGISTRATION REQUIRED BY 30 AUGUST 2018, THURSDAY.

For more details, please call **6394 8746** (Monday – Friday, 8.30am – 5.30pm) or log on to www.kkh.com.sg/events

Seats are confirmed upon full payment on a first-come, first-served basis.
Registration fee is non-refundable.



www.singhealth.com.sg

GP FAST TRACK APPOINTMENT HOTLINES

	Singapore General Hospital	6321 4402
	Changi General Hospital	6850 3333
	Sengkang General Hospital	6472 2000
	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	6357 7095
	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