



# DEFININGMED

MCI (P) 079/09/2020

## Sport & Exercise Medicine

### The Promise of Extracorporeal Shockwave Therapy

Primary Care for Sports Overuse Injuries

Optimising Exercise for Congenital Heart Conditions

**PLUS**

Importance of Dementia Management in Primary Care

Combating Obesity with Endoscopic Sleeve Gastroplasty





# Extracorporeal Shockwave Therapy

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Following various studies into the effects of extracorporeal shockwave therapy (ESWT) on the musculoskeletal system, it has been increasingly used worldwide in treating common sports injuries. With its efficacy and very minimal adverse effects, it presents a promising treatment option for conditions such as proximal plantar fasciitis and tendinopathies.



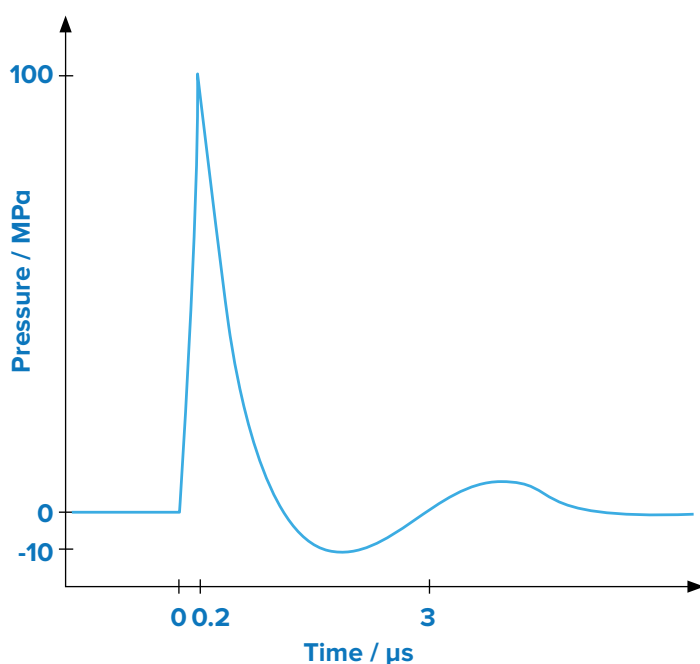
**Extracorporeal shockwave therapy (ESWT)** was first used clinically in the 1980s for the treatment of renal calculi. Its effects on bones were first investigated due to the apprehension that shockwaves may damage the pelvic bone inadvertently during its use in the treatment of renal calculi. Surprisingly, it was found that whilst shockwaves had no considerable effects on intact bone, it may actually stimulate osteogenesis in fractures on animal models.

This led to the first studies into the effects of ESWT on the musculoskeletal system, which were for the fracture non-union of bones. Studies done showed healing rates of between 60 to 90%, depending on the site, type of fracture, time between trauma and ESWT treatment, size of the fracture gap, and adequate stabilisation and immobilisation of the lesion post-treatment.

### SHOCKWAVE TYPES

There are currently two major types of shockwaves used in ESWT, focused shockwaves and radial shockwaves.

**Focused shockwaves** have a single pulse, with an abrupt and nearly discontinuous change in pressure, travelling faster than the speed of sound through the medium it is propagating through (see Figure 1).



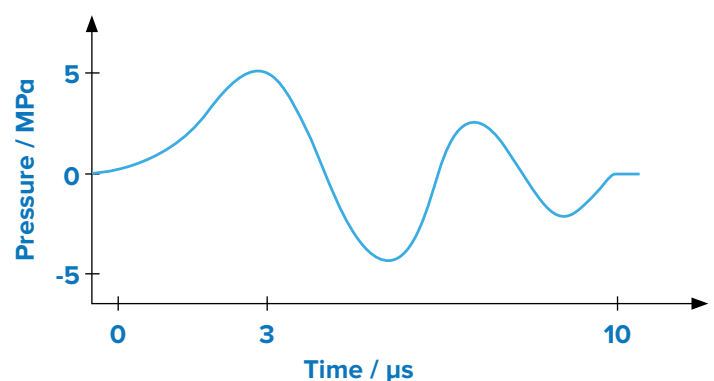
**Figure 1** Schematic pressure profile of focal shockwave (ISMST Basic Physical Principles of Shockwave)

They are generated by electrohydraulic, electromagnetic and piezoelectric devices. They concentrate the shockwave energy on a well-defined point of the target tissue, with varying focal volume, depth of penetration, level of energetic flux density and total energy administered.

**Radial shockwaves** are sound waves whose physical properties significantly differ from those of focused shockwaves, with a slower rise time and a lower energy level (see Figure 2).

The use of focused shockwaves, especially at high energy levels, requires accurate identification of the area to be treated with radiographic or ultrasound guidance to avoid damage to the surrounding tissue and optimise treatment efficacy.

Currently, ESWT has been used for a multitude of musculoskeletal conditions seen at the **Changi General Hospital Sport & Exercise Medicine Department**, with the most common being proximal plantar fasciitis, followed by various tendinopathies such as lateral epicondylitis (tennis elbow), patellar tendinopathy and calcific tendinopathy of the shoulder.



**Figure 2** Schematic pressure profile of radial shockwave (ISMST Basic Physical Principles of Shockwave)

## COMMON CLINICAL APPLICATIONS

### Plantar Fasciitis

Plantar fasciitis is the most common cause of plantar heel pain. Contrary to its name, plantar fasciitis is currently not thought to be due to an inflammation process, but likely secondary to myxoid degeneration, microtears in the fascia tissues and collagen necrosis.

Studies have shown that ESWT has a **success rate ranging from 34 to 88%**, depending on the treatment protocol, devices used and methodology. In our own departmental audit, two-weekly treatments with 2,000 pulses of focused shockwave therapy had a success rate of about 70%.

### Tendinopathies

The second most common use of ESWT in the department is in the treatment of tendinopathies, including tennis elbow, patellar tendinopathy and calcific tendinopathy of the shoulder.

In vitro studies have shown an increase in the gene expression of collagen types I and III and TGF- $\beta$ , followed by the production of nitric oxide (NO) and collagen synthesis in tendons subjected to shockwave therapy. It has been postulated that these mechanisms may play a part in the therapeutic effects seen by ESWT on tendinopathies. Studies have shown treatment **success rates ranging from 68 to 91%**, depending on the area treated, treatment protocol and device used.

There have been very minimal adverse effects reported for ESWT treatment, with the most common being transient pain after treatment, ecchymosis/petechiae, and dyesthesia.

The use of ESWT in the treatment of musculoskeletal disorders has gained traction worldwide due to its efficacy and minimal adverse effects, and can be considered for the aforementioned conditions.



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**6930 6000**





# Treating Common Sports Overuse Injuries in the Primary Setting

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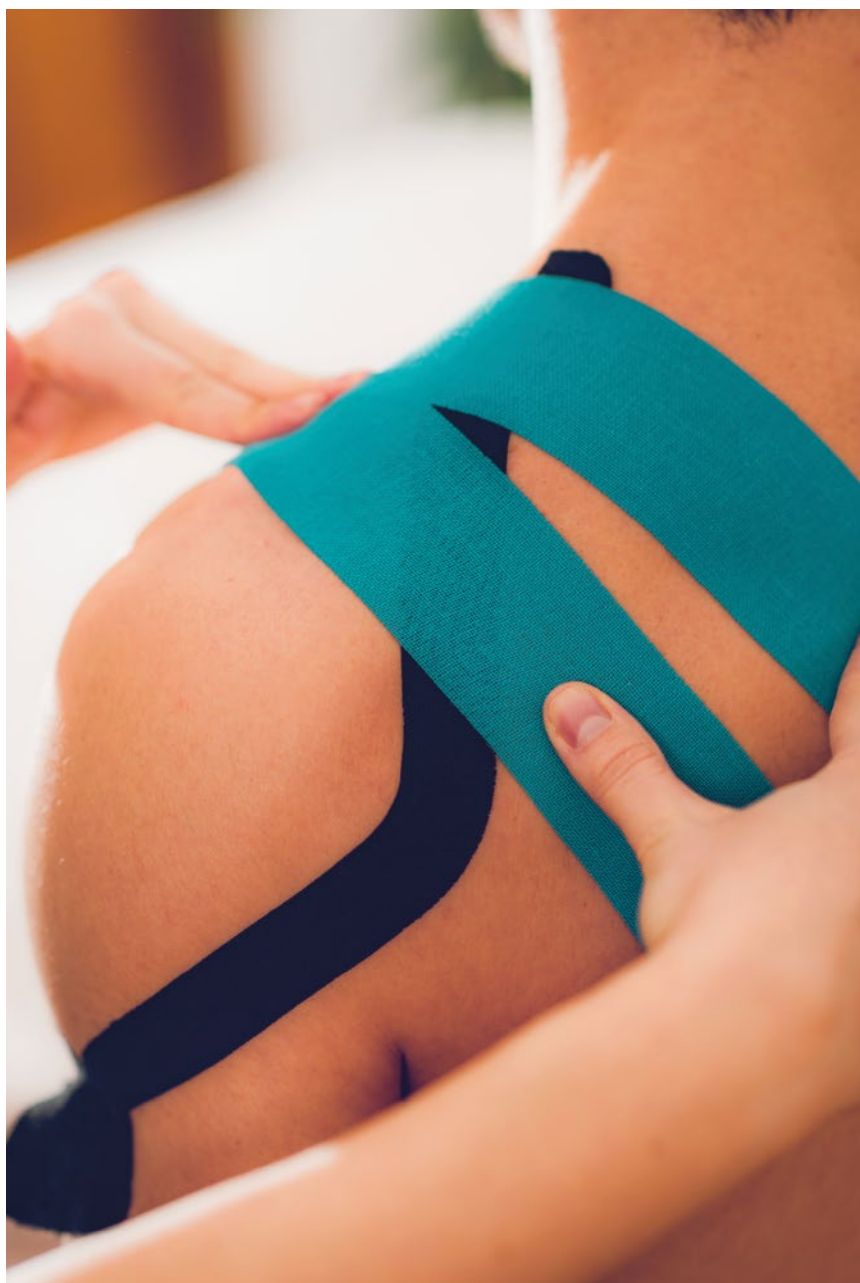
**Rest and analgesia are often insufficient in treating sports overuse injuries. A multidisciplinary approach, with a focus on activity modification, offers the greatest benefit in rehabilitating the injury and preventing it from recurring. Efficient diagnosis and treatment in the primary setting is important to this process.**

A significant proportion of sports injuries are termed 'overuse injuries', occurring due to repetitive loading. The musculoskeletal system undergoes remodelling as a response to stresses imposed on it, but when there is a sudden increase in loading, and/or the body is given insufficient time to recover, overuse injuries occur. Overuse injuries are common in the young and old.

Many factors may place one at risk of overuse injuries, including a sudden increase in training time, change in terrain, as well as muscular tightness or weakness. In tendinopathy, graduated loading of the tendon plays an important role in rehabilitating the injury.

As such, rest is sometimes insufficient to treat these injuries. In addition, complete abstinence from exercise or sports is often detrimental and unnecessary.

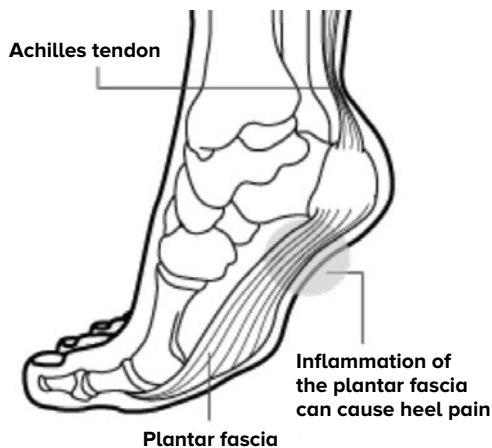
**Hence, the focus should be on activity modification.**



## COMMON OVERUSE INJURIES

Some common overuse injuries seen

### 1 Plantar Fasciitis



The plantar fascia is a thick fibrous tissue that originates from the calcaneum and attaches to the forefoot. Acute plantar fasciitis may be a result of inflammation at the calcaneal insertion to the calcaneum, or in chronic cases due to degeneration. Heel spurs do not appear to be the cause of pain.

Plantar fasciitis may occur in those who stand or walk for prolonged periods, as well as those who do a lot of running or jumping in their sports. Other risk factors for plantar fasciitis include pes planus, pes cavus and tight calves.

Patients typically complain of pain that is worst with the first steps in the morning and/or after prolonged sitting, but some patients may also experience pain worst after prolonged walking.

#### Diagnosis

Most patients will experience tenderness on palpating the medial calcaneal tubercle, though some may have tenderness more laterally. Bedside ultrasound reveals a thickened plantar fascia insertion.

#### Treatment

Initial treatment involves analgesia, advice for proper footwear, plantar fascia massage as well as plantar fascia and calf stretches.

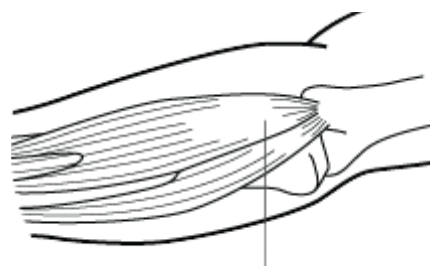
Physiotherapy and podiatry referral may be required at times.

Some patients may require further treatment. Although corticosteroid injection to the plantar fascia is an option, the condition often recurs. For recalcitrant plantar fasciitis that does not respond to initial treatment, an alternative to corticosteroid injection is extracorporeal shockwave therapy (ESWT).

**Extracorporeal shockwave therapy** is available at the Changi General Hospital Sport & Exercise Medicine Department, and is a non-invasive bedside procedure carried out over two sessions, with a one to two weeks interval between sessions.

In the majority of patients, an **improvement in the pain score is observed within two weeks** of the procedure, though it may take up to **three months to see maximal pain relief**.

### 2 Tennis Elbow (Lateral Epicondylopathy of Elbow)



Area of pain on outside of forearm

Tennis elbow refers to tendinopathy of the extensor carpi radialis brevis (ECRB) tendon at its attachment to the lateral epicondyle of the elbow. It is due to overuse of the wrist extensor tendons as a result of repetitive gripping of the hand, wrist extension or forearm pronation.

#### Diagnosis

On examination, there is tenderness on palpation of the lateral epicondyle. There

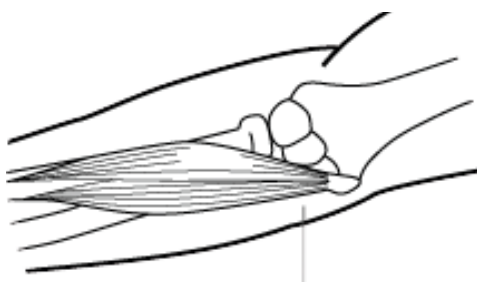
may be pain on wrist flexion with the elbow extended and forearm pronated (Mill's test), as well as on resisted wrist extension (Cozen's test) and resisted middle finger extension (Maudsley's test).

### Treatment

Common treatment modalities include analgesia and using a tennis elbow strap over the proximal forearm. Wrist extensor stretching and strengthening also helps. As incorrect techniques in certain sports may cause tennis elbow, such as improper backhand technique in tennis or improper weightlifting techniques, physiotherapy may be warranted to work on technique optimisation.

Corticosteroid injection can be considered, but those concerned about its risks, or who have had a recent corticosteroid injection to the lateral epicondyle, may consider ESWT as a highly effective adjunctive treatment modality.

## 3 Golfer's Elbow (Medial Epicondylopathy of Elbow)



Area of pain on inside of forearm

Golfer's elbow is similar to tennis elbow, and is due to tendinopathy of the wrist flexor tendons as a result of repetitive wrist flexion or forearm pronation.

### Diagnosis

Tenderness of the medial epicondyle is elicited on palpation. Reverse Mill's test (pain on wrist extension with elbow extended and forearm

supinated) and/or reverse Cozen's test (pain on resisted wrist flexion) may be positive.

### Treatment

Common treatment modalities include analgesia, using a tennis elbow strap over the proximal forearm, wrist flexor stretching and strengthening, as well as physiotherapy and corticosteroid injections. ESWT is a frequently used treatment modality.

## 4 Runner's Knee (Patellofemoral Pain Syndrome)

Patellofemoral pain syndrome (PFPS) refers to anterior knee pain that occurs with activities that involve weighted knee flexion such as running, squatting, climbing stairs, and sometimes cycling. This is due to increased forces across the patellofemoral joint, and is often multifactorial.

Intrinsic risk factors include muscular imbalance (lack of flexibility, strength or control, or poor muscular activation), overpronation of the feet, and patella position while extrinsic risk factors include change in training surfaces, improper footwear and increased training load.

Patients with PFPS can experience pain in the above mentioned activities, or on standing up after prolonged sitting (positive moviegoer's sign).

### Diagnosis

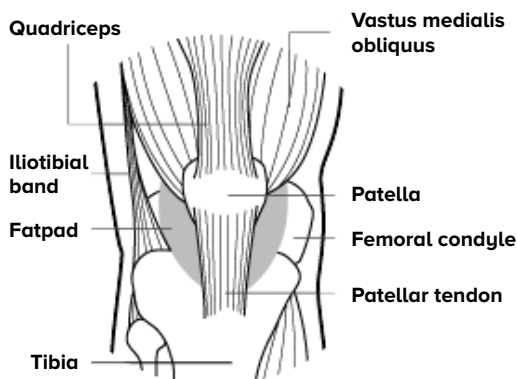
Physical examination of the knee may be normal, although there may be tenderness of the patellar facets and/or a positive Clarke's test and/or patellar grind test.

### Treatment

In PFPS, rest and analgesia alone are often insufficient to treat the condition, as symptoms often recur on resumption of activity. Physiotherapy and podiatry referral may be warranted. A review by a sport and exercise

medicine practitioner is useful for those who require specific activity modification so that they can continue with sports training or exercise.

## 5 Jumper's Knee (Patellar Tendinopathy)



### Symptoms

Individuals with jumper's knee often present with anterior knee pain on jumping, deceleration activities, early to mid-phase of a squat, or in activities that involve a change in direction. The pain is due to patellar tendinopathy, which may involve inflammation or degeneration.

Tenderness is often at the patellar tendon's proximal attachment at the inferior pole of the patella, but may also be at the tendon body or its distal attachment at the tibial tuberosity.

### Treatment

Treatment modalities include analgesia and taping, as well as physiotherapy and podiatry referral. In cases that present with persistent pain, ESWT may be a useful treatment modality.

### CONCLUSION

Overuse injuries are generally a result of multiple predisposing risk factors and not because of a single traumatic event. As such, rest and analgesia are often not sufficient to treat the condition.

A multidisciplinary approach, targeting the correction of these predisposing or risk factors, will be most useful in rehabilitating the injury and preventing it from recurring.



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# Managing Exercise in Children with Congenital Heart Conditions

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**Children with congenital heart conditions are often exempted from physical activity, resulting in a relatively sedentary lifestyle which poses various health risks. However, research has discovered that with the right approach, these children can benefit from physical activity as part of an individualised, safe and appropriate plan.**

## INTRODUCTION

**Congenital heart disease (CHD)** is a common birth defect with a prevalence of nine in 1,000 live births in Singapore.<sup>1</sup> A significant portion of these patients requires regular clinical follow-ups and surgical interventions in early childhood.

As survival rates improve with surgical advances in congenital heart surgery and medical technologies, research into physical activity for patients with congenital heart defects has shown benefits of appropriate moderate physical activity, over the risks of a sedentary lifestyle including obesity, exercise intolerance, acquired cardiovascular diseases and psychosocial morbidities.<sup>2</sup>

In Singapore, children with CHD are often exempted from various forms of physical activity from early childhood and throughout their schooling years, leading to a relatively sedentary lifestyle. These restrictions may be secondary to actual clinical concerns such as outflow tract obstructions, pulmonary vascular diseases or arrhythmias.





However, in many cases, limitations are imposed due to parental and educational institutional concerns, or a lack of clinical understanding of the actual physical and exercise recommendations for the underlying condition.

Medical practitioners play an important role in educating and counselling for appropriate active participation in physical activity during consultation for children with CHD.

Recent consensus guidelines have recommended that children with CHD “comply with public health recommendations of daily participation in **60 minutes or more of moderate-to-vigorous physical activity** (MVPA) that is developmentally appropriate and enjoyable and involves a variety of activities.”<sup>3</sup>

**It is important to recognise that these guidelines distinguish physical activity from exercise.**

**Physical activity** is a broader concept that incorporates “any bodily movement produced by skeletal muscles that results in energy expenditure” and includes activities such as walking and stair climbing.

Whereas, **exercise** is defined as “planned, repetitive and purposeful physical activity designed to improve one or more components of physical fitness”. This comprises a broad range of activities such as aerobic and resistance exercises, leisure-based activities (e.g., cycling, rollerblading), and recreational to competitive sports participation.<sup>2</sup>

There are already established guidelines specific to competitive sports participation in children and adolescents with CHD. The scope of this article is to provide practical recommendations to promote appropriate physical activity participation in children with CHD.

## APPROACH TO PHYSICAL ACTIVITY PROMOTION IN CHD

Promoting physical activity amongst children with CHD needs to take into consideration the multiple factors that can influence participation. Knowing the child’s unique clinical condition and physical function is vital and should be balanced with identifying and addressing common barriers such as parental/family support, level of motivation, activity interests, time, access to equipment and facilities, etc. Gaining an in-depth understanding of the child will help improve the safety and effectiveness of physical activity participation.

The approach to physical activity promotion in children with CHD should include: **clinical assessment, physical activity counselling, individualised physical activity plan** and **follow-up review**.

### 1 Clinical Assessment

Recommendations of physical activities by medical practitioners require a thorough assessment and understanding of the patient’s underlying cardiac condition, as well as presence of any exertional symptoms such as palpitations, excessive dyspnoea and syncope. In addition to non-invasive assessments such as echocardiography and Holter monitoring, formal exercise testing can also be considered to evaluate for cardiovascular risks, to assess changes in the patient’s physiology during exercise and to establish current level of fitness.

**Exercise testing**, commonly known as exercise stress testing, involves the use of progressively increased workload to evoke physiological changes during exertion, usually at or near maximal intensity.

During the test, patients are to exercise until they develop symptoms (e.g., dyspnoea, fatigue) that result in the patient being unable to continue further or at a higher workload. When performed with electrocardiogram (ECG) monitoring, the test is useful for detecting exercise-induced rhythm changes and blood pressure responses.

**Cardiopulmonary exercise testing (CPET)** is similar to standard exercise stress testing.

During this test, ECG monitoring is supplemented with metabolic gas analysis, and provides an objective assessment on the functional capacity of the heart, lungs and peripheral muscle. The test requires the patient to exercise to volitional exhaustion, and physiological parameters such as heart rate, oxygen uptake, and ventilatory thresholds at both sub-maximal and peak exercise intensity are taken.

These readings provide valuable insight into the child's aerobic capacity, circulatory function and gas exchange efficiency. Information from CPET provides objective measurements which can help in the tailoring of a more individualised physical activity prescription for the patient, and also aid in reassuring both family and patient on their ability to partake in recreational or even competitive sports.<sup>4</sup>

## 2 Physical Activity Counselling

Following the clinical evaluation, medical practitioners are encouraged to provide counselling interventions to understand and address concerns pertaining to exercise participation, set realistic goals and provide a management plan for activity participation.

Counselling practices should be based on knowledge about the child's current physical activity level, which can be assessed using appropriate assessment tools such as pedometers, accelerometers or heart rate monitors. These devices provide objective assessment of habitual physical activity level, including frequency, patterns and intensity of activity participation. While the use of appropriate objective assessment tools is recommended, validated questionnaires such as the International Physical Activity Questionnaire (IPAQ) or structured screening questions like the Physical Activity Vital Sign (PAVS) (**Table 1**) can provide a quick assessment of a child's activity and inactivity status.

The conversation on physical activity should ideally involve both child and family, with an aim to create awareness, educate, assess readiness to change and elicit any concerns and barriers regarding physical activity participation.

On average, <b>how many days per week</b> does your child get at least 60 minutes of moderate-to-vigorous physical activity or play (heart beating faster than normal, breathing harder than normal)?	Days per week: _____
<b>On most days of the week</b> , does your child: <ul style="list-style-type: none"> <li>▪ <b>Walk or bike</b> to school?</li> <li>▪ Participate in <b>physical education class</b> at school?</li> <li>▪ Participate in <b>organised physical activity</b> (sports, dance, martial arts, etc.) or spend 30 minutes or more <b>playing outside</b>?</li> </ul>	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No
On average, how many hours per day of recreational screen time (video games, TV, internet, phone, etc.) does your child get?	Hours per day: _____
Is physical activity an area that you want to work on with your family to improve?	<input type="checkbox"/> Yes <input type="checkbox"/> No

**Table 1** Physical Activity Vital Sign (PAVS) – Paediatrics

### Awareness & Education

Medical practitioners should promote physical activity participation based on the general guidelines of 60 minutes of moderate-vigorous physical activity (MVPA) daily.

Activities can range from active transportation and lifestyle or leisure time activities, to health-enhancing activities. Activity time can be built up progressively and accumulated across a day to meet the 60 minutes target.

Wearable devices can be used to monitor their daily activity levels. For children, they should aim to accumulate more than 12,000 steps per day. Assure parents of the safety of appropriate physical activity participation for their child, and highlight the health risks associated with prolonged sedentary behaviour.

The physical activity matrix below (*Table 2*) is a good tool which the child can use to identify areas they can work on to improve their activity

levels, evolving the counselling into patient-centred communication. This can be used as an adjunct for addressing physical activity counselling in a busy clinic setting.

### Motivation and Barriers

Understanding both the child and parents' readiness to change is vital in matching activity advice to their motivational level. The next step would be to help them identify perceived barriers which may influence their participation in physical activity.

Common barriers for children with CHD include poor self-efficacy, parental overprotection, social stigma, exclusion by teachers and peers, lack of knowledge and/or access to safe and enjoyable physical activity programmes. Importantly, the counselling practice should aim to help the child address identified barriers and provide realistic solutions to mediate the adoption of, and influence the adherence to, physical activity participation.



<b>Accumulate 12,000 TO 14,000 steps per day</b>		
Increase lifestyle activities	Increase active transportation	Incorporate active family time
Increase leisure & recreational activities	<b>60 MINUTES</b> moderate-vigorous intensity physical activity <b>DAILY</b>	Increase health-enhancing activities
Have <b>FUN!</b>	<b>START SLOW</b> and increase gradually!	It's the <b>REGULAR</b> that matters in exercise!
Limit leisure time screen activities	Limit sedentary activities to < <b>2HRS / DAY</b>	Break prolonged sitting periods
<b>Get 9 TO 11 HOURS</b> of uninterrupted sleep every night		

*Table 2* Physical activity matrix



### Goal Setting

From the in-depth understanding of the child's motivation and barriers, medical practitioners should work with the child to identify, set and prioritise realistic and measurable physical activity or health goals.

## 3 Individualised Physical Activity Plan

Information from the clinical assessment and physical activity counselling can be used to provide an individualised physical activity plan. Broadly, the type of physical activities recommended should be developmentally appropriate, and target the key dimensions including fundamental movement skills and exercise improving health-related fitness such as aerobic, resistance and flexibility exercises.

An individualised exercise prescription needs to provide recommendations for appropriate intensity in which physical activity or exercise should be performed. This can be determined objectively from a cardiopulmonary exercise

test (CPET) or by calculating relative intensity using age-predicted heart rate formula.

For children with CHD who may have chronotropic incompetence, CPET is recommended, and the target exercise intensity should be based on the workload or heart rate determined at the point of ventilatory threshold identified from the test. Where CPET services are not available, target exercise intensity can be determined using a relative intensity method basing on the age-predicted formula:  $207 - 0.7 \times \text{age}$ .

For most children with CHD, commencement of physical activity at low-to-moderate intensity (50-70%HRmax) is encouraged. Participation in vigorous intensity activities (>70%HRmax) should be introduced gradually and done after a review of their exercise tolerance and fitness. Consideration for higher intensity activities should be based on the underlying physiological function, which can vary with CHD diagnosis and the nature of the exercise or sport.

Relative intensity	% Maximum heart rate (MHR)	Feels like	Rating of perceived exertion (CR-10 scale)
Very light	< 50 %	Little or no effort	0 – 1
Light	50 – 60%	Little breathless and slight exertion	2 – 4
Moderate	60 – 70%	Breathless but can talk and sing whilst exercising	5 – 7
Vigorous	70 – 89%	Very breathless/tired. Unable to complete a full sentence.	8 – 9
Very vigorous	> 90%	Cannot breathe or extremely tired	10

**Table 3** Relative intensity and rating of perceived exertion



**Table 4** shows the classification of sports based on their static (reflects pressure load) or dynamic components (reflects cardiovascular demands). The lowest total cardiovascular demands (cardiac output and blood pressure) are shown in green and the highest in red.<sup>3</sup>

#### 4 Follow-Up Review

Follow-up review of the child's physical activity or exercise prescription is important. The child should be asked about their physical activity experience, specifically if there were any issues that may require adjustments or further evaluation before continuing. For children who have undergone cardiopulmonary exercise evaluation, these should be repeated every two to three years to assess for changes in physiological function before reviewing their activity plan.

#### CONCLUSION

Children with CHD can participate in and benefit from physical activity and exercise. Formal exercise testing can help provide an objective assessment of the child's functional capacity. Child-centred physical activity counselling will be useful for understanding motivation and barriers, and assisting the medical practitioner in formulating a safe and appropriate physical activity plan.

Increasing Static Component	III. High (>50% MVC)	Bobsledding/luge <sup>*,†</sup> , field events (throwing), gymnastics <sup>*,†</sup> , martial arts <sup>*</sup> , sailing, sport climbing, water skiing <sup>*,†</sup> , weight lifting <sup>*,†</sup> , windsurfing <sup>*,†</sup>	Body building <sup>*,†</sup> , downhill skiing <sup>*,†</sup> , skateboarding <sup>*,†</sup> , snowboarding <sup>*,†</sup> , wrestling <sup>*</sup>	Boxing <sup>*</sup> , canoeing/kayaking, cycling <sup>*,†</sup> , decathlon, rowing, speed-skating <sup>*,†</sup> , triathlon <sup>*,†</sup>
	II. Moderate (20-50% MVC)	Archery, auto racing <sup>*,†</sup> , diving <sup>*,†</sup> , equestrian <sup>*,†</sup> , motorcycling <sup>*,†</sup>	American football <sup>*</sup> , field events (jumping), figure skating <sup>*</sup> , rodeoing <sup>*,†</sup> , rugby <sup>*</sup> , running (sprint), surfing <sup>*,†</sup> , synchronised swimming <sup>†</sup>	Basketball <sup>*</sup> , ice hockey <sup>*</sup> , cross-country skiing (skating technique), lacrosse <sup>*</sup> , running (middle distance), swimming, team handball
	I. Low (<20% MVC)	Billiards, bowling cricket, curling, golf, riflery	Baseball/softball <sup>*</sup> , fencing, table tennis, volleyball	Badminton, cross-country skiing (classic technique), field hockey <sup>*</sup> , orienteering, race walking, racquetball/squash, running (long distance), soccer <sup>*</sup> , tennis
		A. Low (<40% VO <sub>2max</sub> )	B. Moderate (40-70% VO <sub>2max</sub> )	C. High (>70% VO <sub>2max</sub> )
		Increasing Dynamic Component		

**Table 4** Classification of sports based on their static (reflects pressure load) or dynamic components (reflects cardiovascular demands)

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GP Appointment Hotline: **6692 2984**

GPs can call the **SingHealth Duke-NUS Sport & Exercise Medicine Centre** for appointments at the following hotlines, or scan the QR code for more information:

**Singapore General Hospital**  
6326 6060

**Changi General Hospital**  
6788 3003

**Sengkang General Hospital**  
Tel: 6930 6000



# The Importance of Dementia Management in Primary Care

**Dr Farah Safdar Husain**

*Service Chief (SingHealth Polyclinics), SingHealth Duke-NUS Memory & Cognitive Disorder Centre;  
Family Physician, SingHealth Polyclinics – Marine Parade*

With a soaring number of dementia cases on the horizon, primary care doctors should be well-equipped to manage the condition in collaboration with specialists in the field. With their intimate knowledge of their patients, family physicians are in a unique position to identify those at risk, and craft individualised management plans to reduce the rate of cognitive decline.

## **INTRODUCTION TO DEMENTIA**

**Dementia**, now also known by the term **major neurocognitive disorder**, is a decline in cognition that is severe enough to affect the function of an individual. The prevalence of dementia in Singapore was found to be 10% among the elderly above 60 years of age, from a Well-being of the Singapore Elderly (WiSE) study conducted in 2013.

With our ageing population, these numbers are expected to soar. Dementia will be a condition seen often enough to warrant a label of chronic disease similar to that of hypertension or diabetes in the near future. As such, through collaboration with experts in the field, primary care doctors should be equipped to manage these patients in the primary care setting.



## THE LINK BETWEEN CARDIOVASCULAR RISK FACTORS AND DEMENTIA

Multiple cardiovascular risk factors have been studied with varying outcomes on their link to dementia. Some of these factors have been shown to increase the risk of cognitive decline and have been linked to the development of both Alzheimer's and vascular dementia.

### Diabetes

Evidence suggests that patients with diabetes are at greater risk of cognitive decline and both vascular and Alzheimer's dementia. A study found this to be consistent in our local population in that diabetes at all stages in life increases the risk of progression to cognitive impairment by at least two-fold.

### Hypertension

As for hypertension, a definite link between hypertension in mid-life and the development of dementia exists, but this association is much stronger and more established with vascular dementia than Alzheimer's.

Hypertension in late-life has not been shown to have this similar association. In fact, some studies demonstrate it may actually be protective against the development of dementia. There is also evidence that good control of these conditions can reduce the progression of cognitive impairment.

### Hyperlipidaemia

Studies are equivocal about hyperlipidaemia and its association with cognitive decline. There is insufficient evidence to demonstrate a benefit in the consumption of statins in the risk reduction of cognitive decline.

### Obesity

In addition, there is some evidence, although inconsistent, that mid-life obesity increases the risk of the development of dementia. A decline in weight from mid-to-late life has also been shown to increase this risk.

## IMPORTANCE OF EARLY DETECTION

**Dementia should not be mistaken for age-related memory loss. Patients who complain of any degree of memory impairment should be evaluated to determine the extent of memory loss and cognitive decline, together with the presence of other associated features before coming to a diagnosis.**

**Early detection empowers a person with dementia to be able to:**

- Prepare themselves and family members emotionally, creating a support system with feelings of empowerment and readiness, rather than anger, shock and denial.
- Have a comprehensive memory assessment, functional assessment, and a look into their behaviour and mood issues. These other aspects of patient care can unravel other issues that occur frequently in elderly such as falls, anxiety and depression. A look into care arrangements may find other concerns such as caregiver stress.
- Be given a decision as to whether or not to start medication for dementia. There is some evidence to suggest that anticholinesterase inhibitors may be beneficial in mild dementia as well, although they are more frequently used in moderate to severe dementia.
- Make decisions about their future while they still have mental capacity – creating a Lasting Power of Attorney (LPA), writing a will, or giving information about their care preferences in an advanced care plan.
- Anticipate future care requirements so that families can make arrangements.

## CASE STUDY

### BACKGROUND

Mr TBH, a 75-year-old retired sales manager with a medical history of diabetes, hypertension and hyperlipidaemia was brought in to SingHealth Polyclinics (SHP) by his daughter for concerns of gradual and progressive short-term memory loss over the last few years.

He had misplaced his personal items (house keys, wallet) on multiple occasions and had forgotten to attend a few medical appointments. His family noticed he had become repetitive with questioning in the last few months and was unable to recall what activities he had done in the past week.

On one night the week prior, he returned home past midnight to a worried and frantic family as he had lost his way home. Mr TBH admitted that this happened, saying it was a “one-off” and that it would not happen again. He denied all other problems related to poor memory and function.

### CLINICAL EVALUATION AND DIAGNOSIS

He was referred to the **SHP Geriatric Service (GRACE): Memory and Cognition clinic** and seen by a Family Physician. Cognitive assessments performed using the Mini-Mental State Examination (MMSE) and Montreal Cognitive Assessment (MoCA) Test revealed problems with working memory and recall. Laboratory tests were arranged, and he was sent for a computed tomography (CT) brain scan in one of the tertiary hospitals.

The results of the investigations were reviewed in the memory clinic. He was subsequently diagnosed with Alzheimer’s dementia and started on donepezil. He was referred to a dementia day care centre and encouraged to continue with mental stimulation activities.

## OPTIMISING DEMENTIA MANAGEMENT IN PRIMARY CARE

Given the strong link between cardiovascular risk factors and the development of dementia, more emphasis should be placed in its prevention. Good and adequate control of cardiovascular risk factors will reduce the incidence of stroke and heart disease, which in turn could have a role in preventing dementia.

**Primary care physicians are well-placed in the community to manage these cardiovascular risk factors, prevent comorbidities associated with these conditions, and hopefully work towards reducing the rate of cognitive decline.**

Primary care physicians have an intimate knowledge of their patients through longitudinal follow-up and

walking them through all vicissitudes of life. They have the benefit of understanding their pre-morbid cognitive function, personality, functional status and social circumstance in addition to the medical issues these patients may have. This puts them in a unique position to identify the patients at risk, notice cognitive changes early, and then craft individualised management plans for persons with dementia.

SingHealth Polyclinics runs the SHP Geriatric Service (GRACE): Memory and Cognition clinic with the support of partner specialists within the tertiary hospitals, enabling our family physicians to diagnose, evaluate and manage persons with dementia, whilst keeping these patients engaged in community activities as far as possible.

## THE SINGHEALTH DUKE-NUS MEMORY & COGNITIVE DISORDER CENTRE

The SingHealth Duke-NUS Memory & Cognitive Disorder Centre was officially launched in September 2020 to provide integrated multidisciplinary clinical practice for cognitively-impaired patients, promote health services, advance innovative research and introduce educational programmes for medical professionals and the public.

The virtual Centre brings together the strengths and expertise of healthcare professionals from neurology, psychiatry, geriatric medicine, internal medicine, primary care and community care from across SingHealth institutions, so patients can receive the right care, at the right time and place.

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### Dr Farah Safdar Husain

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Dr Farah Safdar Husain is a Family Physician and the Deputy Clinical Lead of the Geriatric Workgroup with SingHealth Polyclinics (SHP). She is the Programme Director for the SHP Geriatric Service (GRACE): Memory and Cognition clinics and the Service Chief representing SHP for the SingHealth Duke-NUS Memory & Cognitive Disorder Centre. She is also actively involved in education as Core Faculty Member for the Family Medicine Residency Programme and Clinical Faculty for Yong Loo Lin School of Medicine, National University of Singapore.

GPs who would like more information about managing dementia in primary care, please contact Dr Farah at [farah.safdar.husain@singhealth.com.sg](mailto:farah.safdar.husain@singhealth.com.sg).



GPs can call the **SingHealth Duke-NUS Memory & Cognitive Disorder Centre** for appointments at the following hotlines, or scan the QR code for more information:



**Singapore General Hospital**  
**6326 6060**

**Changi General Hospital**  
**6788 3003**

**Sengkang General Hospital**  
**6930 6000**

**National Neuroscience Institute**  
**6330 6363**

# Endoscopic Sleeve Gastroplasty: A Non-Surgical Approach to Obesity

Dr Ravishankar Asokkumar

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Singapore General Hospital

For many patients with obesity, treatment options have been limited to either diet and lifestyle modifications or invasive procedures like bariatric surgery. Endoscopic sleeve gastroplasty presents an effective non-surgical option that is minimally invasive, reversible, and repeatable with quick recovery time.

## INTRODUCTION

Obesity is a chronic disease. Compared to people with normal weight, it has been shown that the overweight and obese are at increased risk of developing diabetes mellitus, hypertension, cardiovascular disease, stroke, and obstructive sleep apnoea.<sup>1</sup> They are also at higher risk of 13 different types of cancers and increased mortality. Additionally, the quality of life and productivity of obese individuals are shown to be very low.<sup>2</sup>

Obesity is a multifactorial disease with a complex pathophysiology. It is often considered a self-inflicted problem, and patients with obesity are eschewed away with “eat less and exercise more” advice rather than having a concrete long-term care plan. Studies have demonstrated that individuals delay **at least 6 years** before consulting a physician for obesity.<sup>3</sup>

The main treatment goal is to achieve **>10-15%** total body weight loss to observe improvement in obesity-related comorbidities, quality of life, and mortality.<sup>4</sup> The current treatment options are either minimally effective, like diet and lifestyle intervention, or more invasive, like bariatric surgery, catering only to 1-2% of eligible patients with obesity.

**Endoscopic sleeve gastroplasty (ESG)** was developed to break down these barriers and encourage more patients to seek treatment. ESG is a non-surgical endoscopic approach that is an **effective, minimally invasive, reversible, and repeatable** option for obesity with **quick recovery time**.

## PREVALENCE OF OBESITY IN SINGAPORE

There is increasing public, governmental, and healthcare provider awareness of the alarming rise in the incidence of obesity both in Singapore and internationally. It is estimated that the prevalence of obesity in Singapore is around 11% and is expected to go higher. It has been shown that obesity is the single largest contributor to the nation’s disease burden of diabetes mellitus (73%), and recent analyses estimate that Singapore incurs the third highest direct and indirect healthcare spending (US\$0.4-1 billion) arising from obesity in the ASEAN region.<sup>5,6</sup>

## WHAT IS ENDOSCOPIC SLEEVE GASTROPLASTY (ESG)?

ESG is a non-surgical weight loss procedure performed to reduce the size of the stomach in patients with obesity. It is performed using an endoscope fitted with a suturing device at the tip (**Figure 1A**).

The stomach is inspected first, and then an endoscope fitted with a suturing device is introduced orally. Using the device and accessories, multiple full-thickness sutures are placed inside the gastric wall to make it smaller, like a tube, and reduce its distensibility (**Figures 1B and 1C**). ESG leads to significant weight loss by enabling patients to feel full quickly after a meal and thus limiting their meal volume. Additionally, it may also delay gastric emptying causing early satiety.<sup>7</sup>



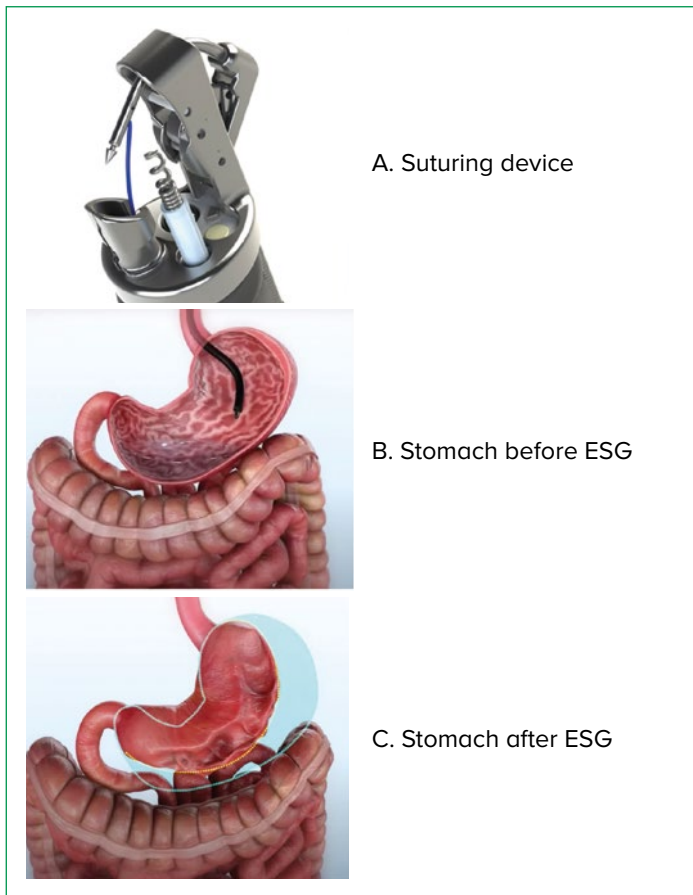


Figure 1 © Apollo Endosurgery, USA

The procedure takes approximately 60 minutes, and the patient needs to stay in the hospital for 24 hours for observation. As ESG is minimally invasive, **the risk of complications is low**, and patients can quickly return to their daily activities.

Like any weight loss procedure, commitment to a healthy lifestyle is required for long-term success. **When combined with lifestyle modification, ESG results in about 15% to 20% total body weight loss at 12 to 24 months.**<sup>8</sup>

### WHO WOULD BENEFIT FROM ESG?

ESG is suitable for:

- Patients with obesity (BMI  $\geq 27.5$  kg/m<sup>2</sup>)
- Patients who do not qualify for bariatric surgery
- Patients who decline or are unsuitable for bariatric surgery
- Patients who are unsuccessful in achieving or maintaining weight loss after diet and lifestyle modification alone

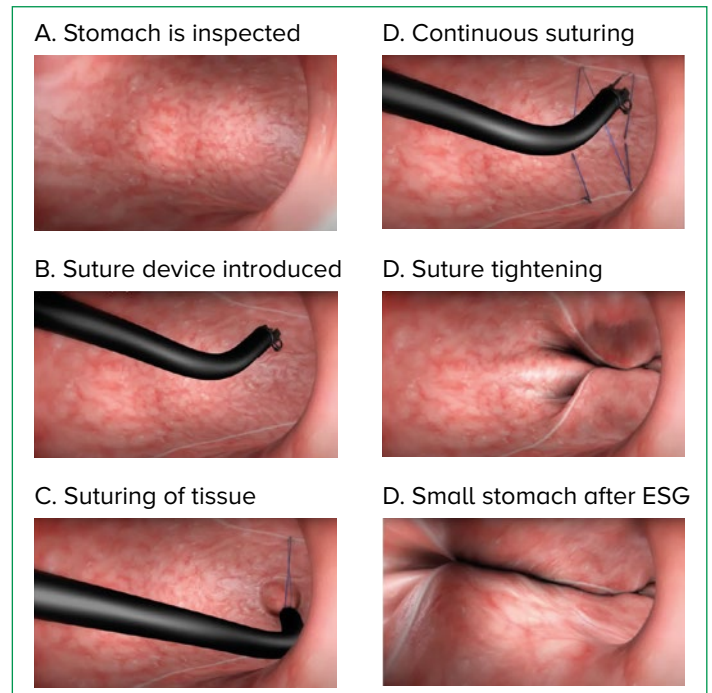


Figure 2 The ESG procedure  
© Apollo Endosurgery, USA

### HOW IS ESG PERFORMED?

The ESG procedure is performed under general anesthesia in an endoscopy unit. A representation of the procedure is shown above (Figure 2). ESG does not involve any incision or scar in the abdomen, and recovery is quick. **The procedure can be reversed when required and can also be repeated in the future, depending on the need.**<sup>9</sup>

### WHAT ARE THE RISKS?

ESG is a safe procedure. The risk of adverse events reported with ESG is around 1-2%. The most frequent symptoms after ESG are abdominal pain and vomiting. The symptoms can be managed with medication and usually resolves within a few days.

Other uncommon adverse events include:

- Post-procedural bleeding
- Perforation (puncture through the wall of the stomach)
- Entrapment of the adjacent organs

Most of these complications can be managed via the endoscope and rarely require surgery. Only extremely rarely may these complications be fatal.

## CASE STUDY

Mrs ABC, a 42-year-old lady, visited our clinic seeking advice on the management of obesity. Her weight was 82 kg and she had a body mass index (BMI) of 31 kg/m<sup>2</sup>. She had diabetes mellitus on insulin, hypertension requiring two medications, and obstructive sleep apnoea. She started gaining weight after her second pregnancy six years ago. She had tried several measures to lose weight but had failed. She was afraid of bariatric surgery and not willing to go under the knife. She then underwent endoscopic sleeve gastroplasty and lost 18 kg at two years. Her life has since been transformed drastically.

### THE BARIATRIC ENDOSCOPY SERVICE IN SGH

The obese population in Singapore is increasing, and most of them are in the middle-age (30-50 years) group. To cater to their needs, the Department of Gastroenterology and Hepatology, Singapore General Hospital (SGH), has established a “Bariatric Endoscopy Service”, integrated with the SGH Obesity Centre. The bariatric endoscopy service is offered as integrated multidisciplinary care for patients with obesity. It offers a variety of minimally invasive procedures to meet patients’ needs and expectations.

#### Increased Acceptance

The service has adopted a patient-centric approach and fulfils the majority of treatment expectations, such as how ESG:

- Is less risky
- Is less invasive
- Has a quick recovery
- Is effective
- Is reversible
- Improves comorbidities and quality of life
- Has no long-term side effects

#### Published Outcomes

More than 15,000 procedures have been performed worldwide, and more than 1,500 research articles have been published on this topic.

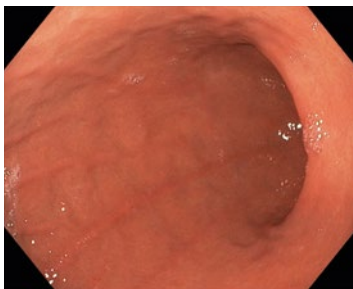
The collaborative studies published by the SGH team show that:

- **At 2 years, the total body weight loss was 15-20%**
- **The adverse event rate was 0.5%**
- **The comorbid resolution was similar to bariatric surgery in the first year**
- **The key to success is compliance with the multidisciplinary follow-up and lifestyle modification after the procedure**

### WHAT ARE THE BENEFITS?

ESG is a less invasive procedure than surgery for enabling patients with obesity to lose weight.<sup>10</sup> By achieving the desired weight loss, patients lower their risk of obesity-related health problems like:

- Type 2 diabetes mellitus
- Hypertension
- Heart disease and stroke
- Fatty liver disease
- High cholesterol
- Sleep apnoea
- Joint pain and osteoarthritis



Normal stomach



After ESG



Contrast Study after ESG

## CONCLUSION

The treatment for obesity has expanded significantly, and there is now a variety of less invasive options to choose from. With these advancements and encouraging results, we hope to witness increasing physician and patient participation to offer and seek treatment and reduce the chronic disease burden.

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Dr Ravishankar Asokkumar is a Consultant with the Department of Gastroenterology and Hepatology at Singapore General Hospital (SGH). He sub-specialises in Bariatric and Metabolic Endoscopy and Advanced Therapeutic Endoscopy. His expertise is in endoscopic gastroplasties and gastric volume reduction procedures.

In 2019, he did his HMDP Advanced Endoscopy fellowship in Spain with Professor Gontrand Lopez-Nava, MD, Ph.D., who is a renowned pioneer and key opinion leader in the field of bariatric endoscopy. During his fellowship, Dr Ravishankar was trained extensively in endoscopic gastroplasties, intragastric balloons, endoscopic bariatric surgery revision procedures, and novel therapies. He was involved in clinical research and has published extensively on this topic.

GPs who would like more information about this procedure, please contact Dr Ravishankar at **9450 0997** or [ravishankar.asokkumar@singhealth.com.sg](mailto:ravishankar.asokkumar@singhealth.com.sg).



GP Appointment Hotline: **6326 6060**

GPs can scan the QR code for more information about the department.



# A Multidisciplinary Centre for Sport and Exercise Medicine Care

**The SingHealth Duke-NUS Sport & Exercise Medicine Centre (SDSC) provides integrated, multidisciplinary and seamless sport and exercise medicine (SEM) care while pushing the frontiers of clinical services, research and education in SEM.**

SEM benefits not only the elite and competitive athletes, but also sedentary individuals looking to start an active and healthy lifestyle, the very young to the very old, and those looking to use exercise as an effective intervention to manage chronic diseases.

## **ABOUT THE SPORT & EXERCISE MEDICINE CENTRE**

The SDSC has the largest headcount among SEM providers in Singapore, with 12 full-time physicians practicing SEM and the largest number of accredited supervisors and training positions for Advanced Specialist Training in Sport and Exercise Medicine.

The SDSC was formed in 2018 to leverage on Changi General Hospital's (CGH) leadership in SEM to better serve patients and respond to evolving healthcare needs. It has since established clinical sites at Singapore General Hospital (SGH) and Sengkang General Hospital (SKH), in addition to existing sites at CGH, SSMC@SSI (Singapore Sport Institute) and SSMC@Novena. This has significantly enhanced patients' accessibility to a comprehensive range of SEM services.

## **CLINICAL EXCELLENCE AND SUPPORT**

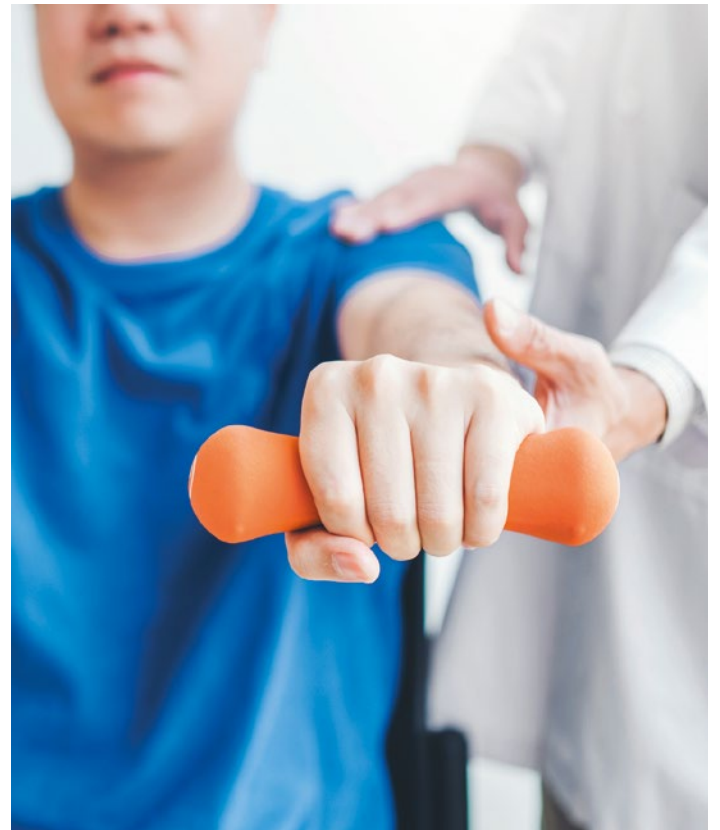
The SDSC is committed to supporting our athletes both on and off the field, including providing national athletes with medical support at major games such as at the 2019 SEA games, 2018 Asian Games, Asian Para Games and Youth Olympic Games. It also provided medical expertise at the 2018 Asian Fencing Championships, ONE Championships and the Formula 1™ Singapore Grand Prix.

## **RESEARCH AND INNOVATION**

As the benefits of exercise in the prevention and management of cancer are becoming evident, this is a rapidly growing field of research. Through the SDSC, Exercise is Medicine Singapore is collaborating with National Cancer Centre Singapore (NCCS) and CGH Rehabilitation Medicine on research in this area, and introducing exercise prescription into oncology practice.

## **COMMUNITY OUTREACH**

Outside of clinical settings, the SDSC supports various community efforts to promote physical activity and healthy living. This is in line with the MOH 'Beyond Healthcare 2020' key thrust of moving 'Beyond Healthcare to Health', where sport and exercise medicine can play a vital role.





# Our Services

The extensive range of integrated Sport & Exercise Medicine services include:

- Sports Injury Treatment & Injury Prevention
- Weight Management
- Athlete Pre-participation Screening
- Diagnostic & Treatment Modalities
- Sports Nutrition
- Sports Podiatry
- Sports Psychology
- Clinical Exercise Physiology
- Performance Enhancement & Exercise Testing
- Exercise Prescription for Managing Chronic Diseases

For GP referrals, please contact the SingHealth Duke-NUS Sport & Exercise Medicine Centre:

Singapore General Hospital  
6326 6060

Changi General Hospital  
6788 3003

Sengkang General Hospital  
6930 6000

Website: [www.singhealth.com.sg/sport-and-exercise-medicine-centre](http://www.singhealth.com.sg/sport-and-exercise-medicine-centre)

# Our Doctors



1

## Head & Senior Consultant

1. **Dr Benedict Tan Chi'-Loong**  
Chief & Senior Consultant,  
Dept of Sport and Exercise Medicine, CGH

## Senior Consultants

2. **Adj Assoc Prof Dr Kelvin Chew Tai Loon**  
Senior Consultant,  
Dept of Sport and Exercise Medicine, CGH;
3. **Adj Assoc Prof Roger Tian Ho Heng**  
Senior Consultant,  
Dept of Sport and Exercise Medicine, CGH

4

## Consultants

4. **Adj Asst Prof Ivy Lim**  
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Dept of Sport and Exercise Medicine, CGH

5

5. **Adj Asst Lim Ang Tee**  
Consultant,  
Dept of Sport and Exercise Medicine, CGH

6

## Associate Consultant

6. **Dr Mandy Zhang Jiajia**  
Associate Consultant,  
Dept of Sport and Exercise Medicine, CGH

# Singapore Eye Bank

## Supporting Corneal Transplants in Singapore

Established in 1991, the Singapore Eye Bank (SEB) at the Singapore National Eye Centre (SNEC) is committed to its national remit of procuring, processing and distributing corneal tissue of the highest quality for corneal transplants performed in Singapore. SEB has since supported over 7,500 corneal transplants.

### THE HOSPITAL EYE DONATION PROGRAMME (HEDP)

While quality corneal tissue can be imported from eye banks in the United States to meet the volume of transplants performed in Singapore, supply and importation could be adversely affected by unforeseen circumstances such as the COVID-19 pandemic, and prices could be prohibitively expensive.

It is therefore critical that SEB continues to focus its efforts on its successful **Hospital Eye Donation Programme (HEDP)**, a collaborative effort between SEB and its network of affiliated hospitals devoted to increasing local cornea output.

There are currently four HEDP-affiliated hospitals across the island: Singapore General Hospital, Tan Tock Seng Hospital, Changi General Hospital and National University Hospital. They are covered by four Eye Donation Counsellors working extended hours to provide grief counselling to the bereaved next-of-kin

of potential hospital donors, advocate the meritorious gift of sight and obtain consent for corneal donation.

Working closely as a team, SEB's four Tissue Coordinators provide 24/7 on-call coverage on rotation, attending to cornea recovery materialising from HEDP as well as multi-organ recoveries nationwide under the Human Organ Transplant Act.

**Corneas procured through HEDP continue to serve as a major source of local donor corneas for Singaporeans and Permanent Residents in need of transplants.**

In 2019, SEB has also begun counselling and conducting cornea recovery at hospices and homes, as local post-discharge care programmes become more comprehensive and readily available, and chronically ill patients are discharged from acute hospitals to hospices or homes for continuous care.



To learn more about SEB, call **6322 8340** or scan the **QR code** to visit the website.



## What happens when a cornea becomes available

### THE HEDP WORKFLOW

- 1 SEB Eye Donation Counsellor is notified of death by HEDP hospitals
- 2 SEB Eye Donation Counsellor determines suitability for cornea donation
  - Checks national Organ Donor Registry
  - Reviews clinical notes to establish cause of death and contraindications
  - Assesses haemodilution status
  - Inspects deceased's corneas to ascertain suitability
- 3 Hospital's Eye Medical Officer certifies corneal donation
- 4 SEB Eye Donation Counsellor approaches next-of-kin for consent
- 5 SEB Eye Donation Counsellor approaches two independent doctors to certify death and complete Interpretation Act Form
- 6 SEB Eye Donation Counsellor coordinates logistical requirements to ready procurement site
- 7 Cornea recovery & blood drawing by Hospital Eye Medical Officer or SEB Tissue Coordinator, assisted by SEB Eye Donation Counsellor
- 8 SEB Eye Donation Counsellor or SEB Tissue Coordinator despatches blood sample for serology testing at various labs
- 9 SEB Eye Donation Counsellor and Tissue Coordinator interpret various pending results (e.g., blood culture, sputum / ETT culture, wound results, AFB, serology)
- 10 All clear, corneal tissue ready for allocation

## How we increase awareness through outreach

### 1. Talks and Updates

By providing regular eye donation awareness talks and educational updates on advances in corneal surgery to medical and nursing staff as well as allied health professionals at HEDP-affiliated hospitals, SEB's team of Eye Donation Counsellors continues to engage its HEDP colleagues in its quest to increase local cornea donation.

### 2. Donor Outreach

Every year, a calendar of donor outreach activities is also organised to increase public awareness to primarily dispel social impediments regarding corneal donation, and provide information on the legislation and process of eye donation with the objective of instilling a pro-eye-donation spirit in the local community.

## SUPPORTING EYE SURGERIES AND PROCEDURES

As corneal surgery increases in complexity, SEB's team of Tissue Coordinators is rigorously trained to perform tissue processing for lamellar corneal surgery.

SEB's **donor pre-cutting service** commenced in late 2011 to serve an increasing number of surgeons performing descemet stripping automated endothelial keratoplasty (DSAEK). Pre-cutting for DSAEK is carried out ahead of scheduled surgery in SEB's facility to shorten surgical time, and at the same time allow for additional quality assurance measures to be performed, thereby increasing patient safety and optimising surgical outcomes.

From April 2019, SEB has rolled out its **pre-stripped cornea service** to support corneal surgeons' progressive switch to a more complex descemet membrane endothelial keratoplasty (DMEK) surgery – which provides patients with better visual acuity, lower rejection of donor tissue and more rapid visual rehabilitation. SEB is one of the first eye banks in Asia to provide this pre-stripped cornea service.

## TRAINING AND RESEARCH

SEB plays a pivotal role in the training and education of medical, nursing, and allied health professional staff through the organisation of lectures, courses and seminars.

In addition to organising the SEB biannual Cornea Procurement Accreditation course, a curriculum essential to all incoming ophthalmology residents, SEB also provides logistical and manpower support to SNEC's ALK/DSAEK/DMEK Advanced Cornea course which runs at least once a year.

SEB also participates actively in conducting and supporting research projects in the field of cornea.

# Specialist Promotions & Appointments

## NEW APPOINTMENTS



**Assoc Prof Andrew Tan Gee Seng**  
*Academic Chair, RADSC ACP;  
Chairman & Senior Consultant*  
Division of Radiological Sciences



**Assoc Prof Lim Boon Leng**  
*Senior Consultant;  
Director, Medical Affairs, SingHealth*  
**Dept**  
Anaesthesiology



**Dr Tan Kian Hian**  
*Head & Senior Consultant*  
**Dept**  
Anaesthesiology



**Assoc Prof Tan Chieh Suai**  
*Head & Senior Consultant*  
**Dept**  
Renal Medicine

## PROMOTIONS – SENIOR CONSULTANTS




**Dr Goh Sin Yee**  
*Senior Consultant*  
**Dept**  
Anaesthesiology




**Dr Thinesh Lee Krishnamoorthy**  
*Senior Consultant*  
**Dept**  
Gastroenterology & Hepatology



**Dr Chua Ying Ying**  
*Senior Consultant*  
**Dept**  
Infectious Diseases



**Dr Tharmmambal Balakrishnan**  
*Senior Consultant*  
**Dept**  
Internal Medicine



**Dr Thang Sue Ping**  
*Senior Consultant*  
**Dept**  
Nuclear Medicine & Molecular Imaging




**Dr Lim Shau Khng**  
*Senior Consultant*  
**Dept**  
Obstetrics & Gynaecology




**Dr Gan Wee Hoe**  
*Senior Consultant*  
**Dept**  
Occupational & Environmental Medicine



**Dr Pang Hee Nee**  
*Senior Consultant*  
**Dept**  
Orthopaedic Surgery




**Dr Teo Wei Yang Neville**  
*Senior Consultant*  
**Dept**  
Otorhinolaryngology – Head & Neck Surgery



**Dr Ng Tze Kiat**  
*Senior Consultant*  
**Dept**  
Urology



**Dr Chan Ju Min Shaun Xavier**  
*Senior Consultant*  
**Dept**  
Vascular & Interventional Radiology



**Dr Ankur Patel**  
*Senior Consultant*  
**Dept**  
Vascular & Interventional Radiology



## PROMOTIONS – SENIOR CONSULTANTS



**Dr Huang Jingxiang**  
*Senior Consultant*  
**Dept**  
Pathology



**Dr Chee Weng Seng  
Ashwin**  
*Senior Consultant*  
**Dept**  
Psychiatry



**Dr Tan Shian Ming**  
*Senior Consultant*  
**Dept**  
Psychiatry

## PROMOTIONS – CONSULTANTS



**Dr Phoon Yee Wei**  
*Consultant*  
**Dept**  
General Medicine  
**Sub-specialty**  
Dermatology



**Dr Lee Yee Wah,  
Margaret**  
*Consultant*  
**Dept**  
Radiology

## APPOINTMENTS – CONSULTANTS



**Dr Rebecca Louise  
Heywood**  
*Consultant*  
**Dept**  
Otorhinolaryngology –  
Head & Neck Surgery



**Dr Phee Mingyu,  
Lynette**  
*Consultant*  
**Dept**  
Pathology

## APPOINTMENTS – ASSOCIATE CONSULTANTS



**Dr Lim Hui Shan  
Cheryl**  
*Associate Consultant*  
**Dept**  
Radiology



**Dr Ganti Srujana**  
*Associate Consultant*  
**Dept**  
Radiology



**Dr Kularathne  
Sembukuttige Yudara  
Madusanka**  
*Associate Consultant*  
**Dept**  
Emergency Medicine



# Specialist Promotions & Appointments

## NEW APPOINTMENTS



**Dr Tan Vic Khi June**

*Head & Senior  
Consultant*

Obstetric Ultrasound  
and Prenatal Diagnostic  
Unit



**Dr Lam Kai Yet**

*Deputy Head &  
Consultant*

**Dept**  
Orthopaedic Surgery

## PROMOTIONS – SENIOR CONSULTANTS



**Dr Shabana Rasheed**

*Senior Consultant*

**Dept**  
Diagnostic and  
Interventional Imaging



**Dr Joseph Carolin  
Jeyanthi**

*Senior Consultant*

General Paediatrics  
Service



**Dr Siew Jia Xuan**

*Senior Consultant*

General Paediatrics  
Service



**Dr Wong Mun Yee  
Sharon**

*Senior Consultant*

General Paediatrics  
Service



**Dr Prasad  
Ramanakrishnan Iyer**

*Senior Consultant*

Haematology/  
Oncology Service



**Adj Asst Prof Yeo Tong  
Hong**

*Senior Consultant*

Neurology Service



**Dr Tan Yi Shuen Tracy**

*Senior Consultant*

**Dept**  
Paediatric Anaesthesia



**Dr Vicknesan Jeyan  
Marimuttu**

*Senior Consultant*

**Dept**  
Psychological Medicine



**Dr Phoon Wai Leng  
Jessie**

*Senior Consultant*

**Dept**  
Reproductive Medicine

## PROMOTION – CONSULTANT



**Dr Lim Lan Fern,  
Michele**

*Consultant*

**Dept**  
Women's Anaesthesia

## APPOINTMENT – SENIOR CONSULTANT




**Dr Chong Chia Li  
Clarisse**

*Senior Consultant*

**Dept**  
Diagnostic and  
Interventional Imaging



## NEW APPOINTMENT




**Clinical Asst Prof Wang Lian Chek Michael**  
*Head & Senior Consultant*

Division of Radiation Oncology

**Sub-specialties**  
Colorectal, Hepato-Pancreato-Biliary, Upper  
Gastrointestinal, Uro-Oncology

## PROMOTIONS – SENIOR CONSULTANTS



**Asst Prof Yip Siew Poh Connie**  
*Senior Consultant*

Division of Radiation Oncology

**Sub-specialties**  
Thoracic-Oncology, Upper  
Gastrointestinal




**Clinical Assoc Prof Chia Shulyn Claramae**  
*Head & Senior Consultant,*  
*Department of Sarcoma, Peritoneal and Rare Tumours*  
*(SPRinT)*

Division of Surgery & Surgical Oncology, SGH and NCCS

**Sub-specialties**  
Upper Gastrointestinal, Colorectal, Peritoneal-based  
Malignancies, Sarcoma, Skin & Melanoma

## APPOINTMENTS – ASSOCIATE CONSULTANTS



**Dr Yang Shiwen Valerie**  
*Associate Consultant*

Division of Medical Oncology

**Sub-specialties**  
Sarcoma, Lymphoma, Skin & Melanoma



**Dr Chua Wan Ying Gail**  
*Associate Consultant*

Division of Radiation Oncology

**Sub-specialties**  
Breast, Haemato-Oncology

## PROMOTION – CONSULTANT



**Dr Wu Siwen**  
*Consultant*

**Dept**  
Restorative Dentistry

**Sub-specialty**  
Endodontics

## APPOINTMENTS – ASSOCIATE CONSULTANTS



**Dr Phang Minle Valene**  
*Associate Consultant*

**Dept**  
Restorative Dentistry


**Sub-specialty**  
Endodontics



**Dr Phua Zong You Jonathan**  
*Associate Consultant*

**Dept**  
Restorative Dentistry

**Sub-specialty**  
Periodontics



**Dr She Meiling Charmaine**  
*Associate Consultant*

**Dept**  
Restorative Dentistry

**Sub-specialty**  
Endodontics

# Specialist Promotions & Appointments



Appointments: 6704 2222 | Email: [central.appt@nhcs.com.sg](mailto:central.appt@nhcs.com.sg)

## PROMOTIONS – CONSULTANTS




**Dr Huang Weiting**  
*Consultant*  
**Dept**  
Cardiology  
**Sub-specialties**  
Echocardiography, Cardiac Magnetic Resonance Imaging




**Dr Huang Zijuan**  
*Consultant*  
**Dept**  
Cardiology  
**Sub-specialties**  
Nuclear Cardiology, Cardiovascular Rehabilitation & Preventive Cardiology

## APPOINTMENT – SENIOR CONSULTANT



**Dr Nakao Masakazu**  
*Senior Consultant*  
**Dept**  
Cardiothoracic Surgery  
**Sub-specialty**  
Paediatric Congenital Cardiothoracic Surgery

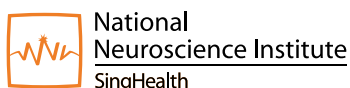
## APPOINTMENTS – ASSOCIATE CONSULTANTS



**Dr Iswaree Devi D/O Balakrishnan**  
*Associate Consultant*  
**Dept**  
Cardiology  
**Sub-specialties**  
Heart Failure, Echocardiography



**Dr Keh Yann Shan**  
*Associate Consultant*  
**Dept**  
Cardiology  
**Sub-specialties**  
Interventional Cardiology, Nuclear Cardiology




Appointments: 6321 4377 (SGH Campus) | 6330 6363 (TTSH Campus) | Email: [appointments@nni.com.sg](mailto:appointments@nni.com.sg)

## NEW APPOINTMENT




**Assoc Prof Au Wing Lok**  
*Senior Consultant;  
Medical Director, Executive Office*  
**Sub-specialties**  
General Neurology, Parkinson Disease, Movement Disorders

## PROMOTIONS – SENIOR CONSULTANTS



**Dr Yasmin Binte Idu Jion**  
*Senior Consultant*  
**Dept**  
Neurology (TTSH Campus)  
**Sub-specialty**  
Headache



**Dr Sumeet Kumar**  
*Senior Consultant*  
**Dept**  
Neuroradiology  
**Sub-specialty**  
Diagnostic Neuroradiology



## PROMOTIONS – SENIOR CONSULTANTS



**Dr Keong Chwee Har Nicole**  
*Senior Consultant*

**Dept**  
Neurosurgery (TTSH Campus)

**Sub-specialties**  
Cerebrovascular Surgery, Neurotrauma,  
Hydrocephalus



**Dr Jai Prashanth Rao**  
*Senior Consultant*

**Dept**  
Neurosurgery (TTSH Campus)

**Sub-specialties**  
Neurotrauma, Skull Base Surgery,  
Endoscopic Pituitary

## PROMOTION – CONSULTANT



**Dr Zhao Yi Jing**  
*Consultant*

**Dept**  
Neurology (SGH Campus)

**Sub-specialty**  
Headache

## APPOINTMENT – SENIOR CONSULTANT



**Dr Robin Pillay**  
*Senior Consultant*

**Dept**  
Neurosurgery (TTSH Campus)

**Sub-specialties**  
Spine Surgery, General Neurosurgery



**Appointments: 6322 9399 | Email: [appointments@s nec.com.sg](mailto:appointments@s nec.com.sg)**

## PROMOTION – SENIOR CONSULTANT



**Assoc Prof Marcus Ang Han Nian**  
*Senior Consultant*

**Dept**  
Cornea and External Eye Disease

**Sub-specialty**  
Ophthalmology

## PROMOTIONS – CONSULTANTS



**Dr Loh Kai-Lyn**  
*Consultant*

**Dept**  
Cataract and Comprehensive  
Ophthalmology

**Sub-specialty**  
Ophthalmology



**Dr Rachel Chong Shujuan**  
*Consultant*

**Dept**  
Glaucoma

**Sub-specialty**  
Ophthalmology

## Embark on a Life-Changing Journey with a Career at SingHealth

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

- SENIOR CONSULTANTS/  
CONSULTANTS/  
ASSOCIATE CONSULTANTS
- RESIDENT PHYSICIANS
- STAFF REGISTRARS/  
SERVICE REGISTRARS

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 DM2010.



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 3 Community Hospitals, it delivers comprehensive, multidisciplinary and integrated care.

### ■ Singapore General Hospital

#### Departments seeking:

#### Resident Physicians and Staff Registrars

- Anaesthesiology
- Diagnostic Radiology
- Family Medicine & Continuing Care
- Emergency Medicine
- Surgical disciplines such as General Surgery, ENT-HNS, O&G, Breast, SPRinT, Colorectal, Vascular Surgery, Urology, Orthopaedics, Hand and Plastic

#### Consultants

- Acute Care Surgery/Trauma
- Anatomical Pathology
- Geriatric Medicine
- Surgical Oncology (Sarcoma, Peritoneal and Rare Tumours)

**Website:** [www.sgh.com.sg](http://www.sgh.com.sg)

**Career Portal:** [www.sgh.com.sg/careers](http://www.sgh.com.sg/careers)

**Email:** [careers.medical@sgh.com.sg](mailto:careers.medical@sgh.com.sg)

### ■ KK Women's and Children's Hospital

#### Departments/Services seeking:

#### Senior Consultants/Consultants/ Associate Consultants

(Gynaecologic & Breast Pathologist,  
Microbiologist, Chemical Pathologist  
and Paediatric Pathologist)

- Pathology & Laboratory Medicine

#### Senior Consultants/Consultants/ Associate Consultants

- Diagnostic & Interventional Imaging

#### Consultants/Associate Consultants

- Child Development

#### Staff Registrars

- Paediatric Surgery

#### Family Physician

- Family Medicine

#### Resident Physicians

- Emergency Medicine
- Orthopaedic Surgery
- Otolaryngology
- Paediatric Surgery

**Website:** [www.kkh.com.sg](http://www.kkh.com.sg)

**Email:** [medical.hr@kkh.com.sg](mailto:medical.hr@kkh.com.sg)

### ■ National Neuroscience Institute

#### Departments seeking Resident Physicians and Service Registrars

- Neurology
- Neuroradiology
- Neurosurgery

**Website:** [www.nni.com.sg](http://www.nni.com.sg)

**Email:** [nni\\_hr@nni.com.sg](mailto:nni_hr@nni.com.sg)

### ■ National Heart Centre Singapore

#### Departments seeking Resident Physicians

- Cardiology
- Cardiothoracic Surgery

**Website:** [www.nhcs.com.sg](http://www.nhcs.com.sg)

**Email:** [joyce.soh.y.h@nhcs.com.sg](mailto:joyce.soh.y.h@nhcs.com.sg)

### ■ Sengkang General Hospital

#### Departments seeking:

#### Resident Physicians and Staff Registrars

- Anaesthesiology
- Cardiology
- Emergency Medicine
- Surgery
- General Medicine (with interest in Dermatology, General Medicine and Palliative Medicine)
- Intensive Care Medicine
- Orthopaedic Surgery (with interest in Hand Surgery and Orthopaedic Surgery)
- Otorhinolaryngology – Head & Neck Surgery
- Plastic, Reconstructive & Aesthetic Surgery Services
- Urology

#### Senior Consultant, Consultant, Associate Consultant

- Radiology
- Pathology
- Urology

**Website:** [www.skh.com.sg](http://www.skh.com.sg)

**Career Portal:** [www.skh.com.sg/careers/  
Pages/careers.aspx](http://www.skh.com.sg/careers/Pages/careers.aspx)

**Email:** [careers@skh.com.sg](mailto:careers@skh.com.sg)

### ■ Singapore National Eye Centre

#### Department seeking

- Clinical Associate, Clinical Services Department
- Resident Physician, Ophthalmology

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

**Website:** [www.shec.com.sg](http://www.shec.com.sg)

**Email:** [recruitment@shec.com.sg](mailto:recruitment@shec.com.sg)

### ■ SingHealth Community Hospitals (Sengkang Community Hospital, Outram Community Hospital and Bright Vision Hospital)

#### Department seeking:

- #### Consultant, Associate Consultant, Staff Registrars, Resident Physicians
- Family Medicine

**Website:** <http://www.singhealthch.com.sg/>

**Career Portal:** [www.singhealth.com.sg/  
SCH/careers/Pages/Careers.aspx](http://www.singhealth.com.sg/SCH/careers/Pages/Careers.aspx)

**Email:** [schrecruitment@singhealthch.com.sg](mailto:schrecruitment@singhealthch.com.sg)





KK Women's and  
Children's Hospital  
SingHealth

## Women's Health Webinar 2020

Join us online for an insightful look into the latest advancements and discoveries in the field of women's health.

As part of the 10 year anniversary celebrations of the Family Medicine Service in KKH, this webinar aims to provide an update on women's health topics of particular interest to family doctors, gynaecologists and resident doctors, as well as nurses and allied healthcare professionals.

### Topics include

The changing landscape in sexual health in Singapore

Vulval dermatoses

Psychosexual rehabilitation in sexual dysfunction

Perioperative care of gynaecological patients

Update on cervical cancer screening and prevention

Heavy menstrual bleeding: An update

Nil-by-mouth protocol for type 2 diabetic patients for gynaecology elective procedures

### Date & Time

#### Pre-conference:

23 October 2020 (Friday)  
2.00pm to 5.00pm

#### Main conference:

24 October 2020 (Saturday)  
9.00am to 4.30pm

Hosted via  
Zoom Webinar

CME and  
SNB-CPE points  
will be awarded



#### Free admission (Pre-registration is required)

Registration closes on **20 October 2020 (Tuesday)**. Slots will be allocated on a first-come, first-served basis.

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

# CMEs & Courses



KK Women's and  
Children's Hospital  
SingHealth

## 17th Practice Update in Paediatrics – Adapting to the New Normal in Paediatrics

From COVID-19 to other relevant topics in our evolving world, join us to discuss the latest clinical updates and best practices in treating common paediatric conditions.

### Topics include

COVID-19 - A  
paediatric perspective

Growth concerns in  
children

Chest deformities  
in children

Paediatric brain tumours:  
Challenges and redflags  
in making the diagnosis



#### Date

21 November 2020 (Saturday)

#### Time

1.25pm to 4.20pm

Hosted via  
Zoom Webinar

CME and SNB-CPE points  
will be awarded



**Free admission (Pre-registration is required)**  
Registration closes on **17 November 2020 (Tuesday)**. Slots will be allocated on a first-come, first-served basis.

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

## HOTLINES



SingHealth

[www.singhealth.com.sg](http://www.singhealth.com.sg)

### GP Fast Track Appointment Hotlines



Singapore  
General Hospital **6326 6060**



Changi  
General Hospital **6788 3003**



Sengkang  
General Hospital **6930 6000**



KK Women's and  
Children's Hospital **6692 2984**



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



Singapore  
General Hospital **6326 6060**



Changi  
General Hospital **6850 1648**



KK Women's and  
Children's Hospital **6692 2984**