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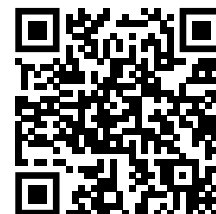
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What's New in Treating Patients with Insomnia in Primary Care?

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Department of Psychiatry, Singapore General Hospital

Insomnia is a condition commonly seen by general practitioners in their practice, where they are in a prime position to spearhead detection, assessment and management. Find out more about how insomnia can be treated in primary care.

INTRODUCTION TO INSOMNIA

Insomnia is a highly prevalent disorder occurring in up to 50% of primary care patients. Two previous studies both found that about 27% of Singapore residents reported significant poor sleep.

It is linked to increased healthcare utilisation and costs, and is very often comorbid with other medical and psychiatric disorders.

Insomnia and comorbidities

Insomnia has a bidirectional link with comorbidities, where insomnia worsens the comorbidity, and the comorbidity worsens insomnia.

Insomnia is associated with an increased risk of cognitive impairment, diabetes, hypertension and mortality, whilst treating insomnia may improve the outcomes for the comorbidity.¹⁻⁵

DIAGNOSIS

The key features of **chronic insomnia** are:

- Difficulty falling asleep, maintaining sleep, or early-morning awakening
- Impairment in important areas of functioning, despite the adequate opportunity to sleep
- Occurring for at least three nights per week, for at least three months

Both the International Classification of Sleep Disorders – Third Edition (ICSD-3) and the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) recognise that even if insomnia is precipitated by another medical or psychiatric condition, it is important to address both disorders.

Insomnia is best viewed as a comorbid disorder that warrants separate treatment attention.³



Assessment Tools

1. HISTORY TAKING

A comprehensive clinical history is the cornerstone of assessment for insomnia.

Table 1 can be used to guide history taking, with additional considerations indicated.

The assessment can be further supplemented with screening questionnaires and tools:

- The **Insomnia Severity Index (ISI)** is a short self-report seven-item questionnaire to assess the severity of insomnia.
- A **sleep diary** can be useful to characterise the nature and pattern of sleep problems, and identify circadian rhythm disorders.³⁻⁴

A Guide for Sleep History Taking

	History	Additional considerations
a. Chief complaint	Is it a problem of sleep initiation (falling asleep), maintenance (staying asleep), early termination, and/or unrefreshing sleep? What is the frequency, course, severity and impact?	The impact of poor sleep can include changes to mood, cognition, performance and naps. Patients with insomnia often have difficulties taking naps, whilst patients with other sleep disorders may be sleepy and nap often.
b. Onset of issues	Age of onset, previous episodes of insomnia, premorbid sleep patterns. How have they changed over time?	Explore if the chronology of symptoms is linked to changes in medications, medical conditions, changes to work or lifestyle, or significant life events.
c. Sleep-wake schedule	Time they go to bed, latency to sleep, awakenings and time awake, time they get out of bed, and total sleep time. Any daytime naps? Is there a regular routine? Was there a change in schedule, weekday and weekend pattern, history of shift work?	Circadian rhythm disorders such as delayed sleep phase disorder can exacerbate insomnia. Patients may also attempt to go to bed earlier or later than usual, exacerbating the difficulty in falling asleep. Does their schedule allow adequate opportunity for sleep?
d. Cognitions and psychiatric conditions	Worries about sleep extending into anxiety about other things, panic attacks, low mood, anhedonia, suicidal thoughts, trauma symptoms.	Screen for depression, anxiety and other psychiatric disorders like post-traumatic stress disorder, which would need to be concurrently managed.
e. History of sleep behaviours, including from bed partners	Loud snoring, apnoea, snort arousals, repetitive movements (e.g., twitching of toes or moving of legs), acting out of dreams or sleep-walking.	Sleep studies are not routinely done for insomnia, but may be needed to rule out other sleep disorders. Sleep state misperception can occur when patients perceive that they are awake, but are observed to be asleep.
f. Expectations and past treatment	What are they most worried about, and how does it affect them? What have they done/tried, and did it work?	Having an idea of their expectations of sleep is important to understand which interventions may benefit them. Some associate the recall of dreams with poor sleep, and expect medications to 'knock them out'.

A Guide for Sleep History Taking

	History	Additional considerations
g. Sleep hygiene & environment	<p>Practices intended to improve sleep (e.g., staying in bed late, going to bed early, the use of alcohol and sleep aids).</p> <p>Practices intended to counter fatigue (e.g., more caffeine/stimulants, reduced physical activity, napping).</p> <p>Habits including clock watching and not winding down before bed.</p>	<p>Exploring the challenges in adhering to sleep hygiene can be helpful to tailor interventions. Past difficulties complying with sleep hygiene should be explored.</p> <p>Is there revenge bedtime procrastination – trying to get more leisure time before bed, and excessive use of devices?</p>
h. Other sleep disorders and medical conditions	<p>Restlessness before bed (needing to walk/move, worse towards evening), nocturia, pain, breathlessness, headaches.</p> <p>Any changes in medications, or existing chronic medical conditions? Are they going through menopause?</p>	<p>Insomnia may be precipitated or perpetuated by other physical issues which can disrupt sleep, though they may also be a sign of other underlying causes (e.g., sleep apnoea).</p> <p>Stimulating medications can prevent sleep, while sedating medications cause sleepiness in the day.</p>

2. WEARABLE DEVICES

There are many commercial products now available to monitor sleep. The use of wearable devices to monitor sleep has been promising, though studies show there is often a risk of overestimating or underestimating total sleep time.

Limitations

Through sophisticated algorithms, the devices try to identify sleep, stages of sleep and quality. This has to be interpreted with caution, and at times may worsen insomnia if there is excessive monitoring of sleep.

The reliability of the devices will also be affected by underlying health conditions or sleep disorders, which limit the specificity with sleep stages and reliability of measuring time asleep.^{2,6}

Benefits

A key advantage of these devices is the collection of data over multiple nights at low cost, which might mitigate some of the limitations of a sleep study.

Future applications

As the technology develops, it may present opportunities for sleep disorder screening and incorporating these tools into treatment plans.

The use of digital sleep diaries, sometimes combined with wearable devices, also has great potential, though further evidence is needed to incorporate it into routine clinical practice.⁶

3. SLEEP STUDIES

Sleep studies (e.g., **polysomnography**) are not usually done for insomnia, but may be performed if there are other sleep disorders to consider, such as sleep apnoea or periodic limb movement disorder.

A **home sleep study** may be used in cases with a high index of suspicion for underlying obstructive sleep apnoea (OSA).

An **actigraphy** may be used for suspected circadian rhythm disorders, or where the sleep log or history is not reliable.³⁻⁴



Management

Treatment has to include the management of any comorbidities contributing to insomnia, in addition to the insomnia itself. Treatment options should take into account the features identified in history, suspected differential diagnoses, past treatments received and concerns with potential side effects.

1. SLEEP HYGIENE EDUCATION

Sleep hygiene education can be helpful for mild insomnia, but is rarely sufficient for more severe insomnia, which requires more directive behavioural interventions.

A sleep hygiene handout can be provided to patients, available from the SingHealth Duke-NUS Sleep Centre website (*scan the QR code for an e-copy*).



2. COGNITIVE BEHAVIOURAL THERAPY

Cognitive behavioural therapy for insomnia (CBT-I) is the first-line recommendation for insomnia, even in the presence of other medical conditions.

It is a structured therapy with a psychologist, specifically designed for insomnia, that usually comprises about four to seven sessions for most patients.

Limitations

However, access to CBT-I remains the biggest barrier worldwide. Some psychologists provide teleconsultations remotely which may help with accessibility, and some studies have found these modalities to be of equal efficacy to in-person sessions.⁵

Mobile applications

There are mobile applications that aim to deliver CBT-I, which increases accessibility and may overcome some of its usual challenges. Some of them are commercially produced, and some are free from research institutions and readily available.

There is evidence for its use to complement existing treatment, and it may also help with psychoeducation on sleep hygiene. A digital CBT-I application with promising evidence is in use in some healthcare settings in the United States and United Kingdom at a cost per user, but not currently available in Singapore.

There is a free application, produced by the U.S. Veterans Affairs' National Center for PTSD, which incorporates CBT-I and is easily accessible. It includes interactive elements, tools and a sleep diary.²⁻³



3. PHARMACOLOGICAL OPTIONS

Medications may be used for relief of symptoms, and should be considered in the context of the patient and illness characteristics.

As many medications used are sedating, there is an increased risk of falls, and the potential for impairment in functioning including risk of accidents from operating motor vehicles.

There is very limited evidence for the long-term use of medications. The risk-benefit of treatment and expectations should be discussed before starting on them. There may also be an additional role of using medications to complement ongoing CBT-I.⁵

a. Prolonged-release melatonin

Prolonged-release melatonin (Circadin) is a prescription-only medication that has been approved for insomnia in patients above the age of 55. It may be additionally useful in patients with circadian rhythm disorders, combined with behavioural changes and light therapy. A melatonin receptor agonist (ramelteon) has been approved by the FDA for insomnia but is not available locally.^{6,8}

b. GABAergic sedative hypnotic drugs or Z-drugs

GABAergic sedative hypnotic drugs, including benzodiazepines (e.g., clonazepam, lorazepam, alprazolam, diazepam) and benzodiazepine receptor agonists, or Z-drugs (e.g., zolpidem, zopiclone) can be effective in inducing sleep.

They can be prescribed for short-term use, especially in acute insomnia. However, prolonged use or abuse can lead to tolerance and dependence-forming habits, especially in those with chronic insomnia, and they should be stopped within four weeks.

There is an increased risk of falls in the elderly, and it can interfere with memory consolidation during sleep. In patients with suspected OSA, benzodiazepines should not be used as they can worsen sleep apnoea. Z-drugs may also cause parasomnias.²⁻⁵

c. Dual orexin receptor antagonists (DORA)

Dual orexin receptor antagonists (DORA) (e.g., lemborexant, suvorexant) are a new class of medications that works by inhibiting the orexin-alerting system, which is affected in narcolepsy.

It can promote sleep when there is hyperarousal, hyperactivation or conditioned wakefulness, and appears to have a favourable side effect profile compared to some hypnotics. Side effects include sedation, abnormal dreams, headaches and dizziness.

Lemborexant has been recently approved for use in insomnia by the Health Sciences Authority (HSA) and is available locally.⁴

d. Antihistamines

Antihistamines (e.g., chlorpheniramine, hydroxyzine) are often used for insomnia, though there is very limited data supporting its use. They are more accessible, though common complaints include oversedation continuing into the next day. They can also have significant anticholinergic side effects.²



Management (Continued)

3. PHARMACOLOGICAL OPTIONS

e. Antidepressants

Antidepressants may be used off-label especially if there are comorbid mood or anxiety symptoms. More frequently used antidepressants include trazodone, mirtazapine, and tricyclic antidepressants like doxepin and amitriptyline which can be helpful.

In the elderly, caution is recommended due to the anticholinergic side effects. Doxepin 3 mg or 6 mg was approved for insomnia by the FDA, though locally those doses are not available.^{2,8}

f. Anticonvulsants

Anticonvulsants (e.g., pregabalin, gabapentin) can be helpful especially in patients with pain, restless legs syndrome, generalised anxiety disorder and epilepsy.

g. Antipsychotics

Antipsychotics (e.g., quetiapine, olanzapine) are also used, but caution is required especially with their metabolic side effects.²

THE GP'S ROLE IN CARE

Primary care practitioners play a key role in screening and identifying patients suffering from insomnia and other sleep disorders, and treating them.

This includes:

- Careful assessment for other comorbidities that may also require treatment
- Being aware of both the role and limitations of medications in chronic insomnia

- Managing the patient's expectations with regard to medications, sleep and perceived sleep quality
- Recommending behavioural changes before or together with the use of medications

Once patients are stabilised, they may also need ongoing monitoring and reassurance, as well as a plan should the insomnia relapse.

WHEN GPs SHOULD REFER A PATIENT

If comorbidity is suspected, or if patients do not respond to treatment, referral to a sleep specialist may be warranted. Psychiatrists at sleep centres see patients referred for insomnia, as well as patients with comorbid psychiatric disorders and sleep disorders.

At the **SingHealth Duke-NUS Sleep Centre**, there is a multidisciplinary team to evaluate the full range of sleep disorders. A comprehensive assessment

is done, and if required, further investigations including a home sleep study or polysomnography can be performed.

At the Centre's clinical sites at Singapore General Hospital, Changi General Hospital and Sengkang General Hospital, there are psychiatrists and psychologists to assess and manage patients presenting with insomnia, and patients may also receive CBT-I.

CONCLUSION

Insomnia is common and has significant consequences for an individual’s health and quality of life. There is a high comorbidity with other diseases which needs to be treated concurrently.

The mainstay of treatment should be behavioural therapy, though a growing range of pharmacological options do exist. With medications, caution and additional considerations include long-term use, side effects and potential for abuse and dependence.

It helps to manage the patient’s expectations and follow up longitudinally, as behavioural change takes time.



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- To view all references, please refer to the online version of Defining Med by scanning the QR code on the cover page.*



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GPs can call the **SingHealth Duke-NUS Sleep 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	KK Women's and Children's Hospital 6692 2984	National Dental Centre Singapore 6324 8798	National Neuroscience Institute 6330 6363
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Myofunctional Therapy: A Non-invasive Approach to Managing Sleep Apnoea

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A promising new adjunct therapy is gaining traction for its potential efficacy in improving symptoms of sleep apnoea. Read all about myofunctional therapy – an exercise-based approach targeting the muscles of the mouth and face – including how it works, its clinical applications and patient outcomes.

Obstructive sleep apnoea (OSA) is a common and chronic sleep disorder characterised by **repetitive episodes of partial or complete cessation of breathing during sleep**, leading to disrupted sleep and decreased oxygen levels.

It is a significant health concern affecting one billion people worldwide and at least one in three Singaporeans.

It is associated with increased risks of:

- Cardiovascular disease
- Metabolic disorders
- Neurocognitive decline
- Reduced workplace productivity
- Reduced quality of life

A NEW AND PROMISING ADJUNCTIVE THERAPY

Conventional treatment options for OSA include continuous positive airway pressure (CPAP) therapy, oral appliances, surgery and weight loss, but adherence and effectiveness can vary.

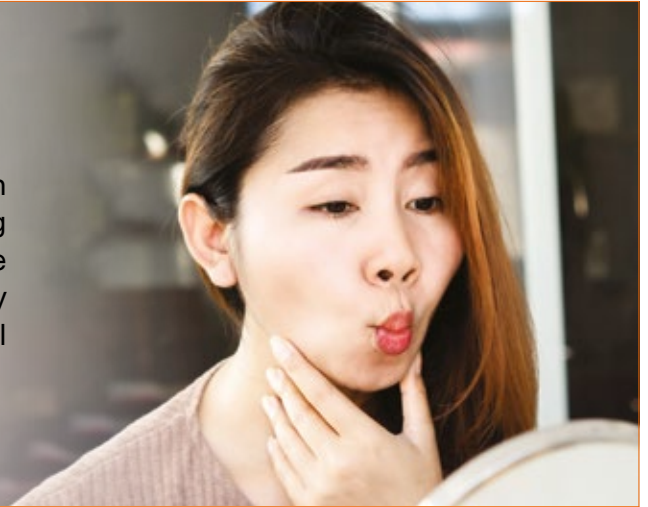
Myofunctional therapy has emerged as a promising adjunctive therapy for OSA management owing to its non-invasive approach.

In this article, we will summarise the current evidence for myofunctional therapy, and discuss its challenges and future directions as an innovative approach for improving OSA outcomes.



WHAT IS MYOFUNCTIONAL THERAPY?

Myofunctional therapy is a type of therapy that focuses on exercise for the muscles of the mouth and face, including the tongue, lips and jaw. It is aimed at improving the function and coordination of these muscles – which play a crucial role in breathing, swallowing, speech and overall oral health – to address the underlying causes of OSA.



POTENTIAL MECHANISMS OF ACTION

A common cause of OSA

OSA is characterised by **repetitive upper airway collapse during sleep**. In up to 36% of OSA patients, poor muscle responsiveness of the upper airway dilator muscles is seen, leading to increased upper airway collapse.

This is where there is little upper airway muscle activity in response to increasing negative pharyngeal pressure generated during obstructive respiratory episodes.¹ As demonstrated by Sands et al., enhanced upper airway muscle responsiveness serves as a protective factor against OSA in overweight and obese patients.²

How myofunctional therapy can help

Myofunctional therapy exercises aim to **strengthen and retrain upper airway dilator muscles**, such as the genioglossus muscle, to improve muscle tone and endurance. This helps in maintaining airway patency during sleep and reducing symptoms of OSA.

Furthermore, many OSA patients mouth-breathe during sleep, which leads to a backward displacement of the tongue and further narrowing of the retroglossal airway, thereby increasing the risk of upper airway collapse.

Myofunctional therapy can be used to improve nasal breathing and encourage lip seal / mouth closure, so as to **create a more stabilised upper airway during sleep**.

INDICATIONS

Myofunctional therapy can be used as an adjunctive therapy for OSA management.

It can be used:

- To reduce snoring symptoms
- As an adjunct to help reduce CPAP pressure and facilitate CPAP use
- In postoperative sleep surgery patients, to reduce residual snoring or risk of recurrence



HOW IT IS DELIVERED

It is typically provided by trained orofacial myofunctional therapists.

Myofunctional therapy is tailored to each individual's needs and may include a variety of exercises and techniques to improve tongue strength, oral posture and nasal breathing.

It may also be combined with lifestyle modifications, such as dietary changes and sleep hygiene practices, to support overall sleep health.

Myofunctional therapy is typically delivered in a structured programme, and patient compliance and adherence are important for achieving optimal outcomes.

SAMPLE EXERCISES

1. Tongue slide



Exercise:

Press the tip of your tongue on your top front teeth. Slowly slide your tongue backwards. Repeat five times.

Purpose of exercise:

To strengthen the tongue and throat muscles.

2. Tongue stretch



Exercise:

Stick out your tongue as far as you can. Try to touch your chin with your tongue while looking at the ceiling. Hold for 10 to 15 seconds and increase the duration gradually. Repeat five times.



Purpose of exercise:

To increase the tone and strength of the tongue.

OUTCOMES AND EVIDENCE

Emerging evidence suggests that myofunctional therapy is effective in improving OSA outcomes, including OSA symptoms and sleep study parameters.

Systematic review and meta-analysis by Camacho et al. demonstrated orofacial myofunctional therapy as an effective treatment method for OSA in:³

- Reducing apnoea-hypopnoea index (AHI)
- Improving lowest oxygen saturation
- Decreasing snoring
- Improving sleepiness

However, the limitation of this meta-analysis is that it consists mainly of small cohort studies.

As an adjunct to CPAP usage, myofunctional therapy has been shown in a randomised controlled trial to reduce overall CPAP therapy pressure and improve adherence to CPAP.⁴

Further research with larger sample sizes, rigorous study designs, and long-term follow-up is needed to better understand the effectiveness of myofunctional therapy and its optimal use in OSA patients.

HOW TO REFER A PATIENT FOR MYOFUNCTIONAL THERAPY

Our Sleep Units at Singapore General Hospital and Sengkang General Hospital offer myofunctional therapy to OSA patients and/or primary snorers, with the aims of improving their condition and symptoms.

GPs can refer patients by contacting the Sleep Units at:

Singapore General Hospital

Tel: 6326 6060

Email: appointments@sgh.com.sg

Sengkang General Hospital

Tel: 6930 6000

Email: appointments@skh.com.sg



Scan the QR code to read more about myofunctional therapy and other sample exercises.



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During her sleep surgery fellowship, she obtained accreditation for the da Vinci transoral robotic surgery for sleep apnoea. To provide better care for sleep apnoea patients, Dr Phua undertook further fellowship training in craniofacial surgery (maxillomandibular advancement surgery) for sleep apnoea patients at the Chang Gung Memorial Hospital, a highly sought-after fellowship done in a high-volume surgical centre with over 600 orthognathic surgeries performed yearly.



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

Singapore General Hospital
6326 6060

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6930 6000

KK Women's and Children's Hospital
6692 2984

National Dental Centre Singapore
6324 8798

National Neuroscience Institute
6330 6363



Obstructive Sleep Apnoea: All You Need to Know, From Diagnosis to Treatment

Dr Marcus Sim

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With almost a third of Singaporeans affected by obstructive sleep apnoea (OSA), general practitioners are bound to encounter patients with this sleep disorder in their practice. The SingHealth Duke-NUS Sleep Centre shares an overview of the condition's essential facts, from presentation and diagnosis to the various treatment modalities available.

WHAT IS OBSTRUCTIVE SLEEP APNOEA?

Obstructive sleep apnoea (OSA) is a condition associated with **repetitive episodes of upper airway obstruction during sleep**. These episodes are associated with hypoxia and arousal leading to sleep disruption.

Impact

OSA affects daytime functioning, causes poor mood, affects memory, reduces concentration and increases the risk of driving accidents.^{1,2}

Large swings in intrathoracic pressure which occur during upper airway obstruction and hypoxia activate the sympathetic system, and lead to a range of cardiovascular and metabolic conditions.³ In elderly patients, OSA is also linked to an increased risk of cognitive impairment.⁴

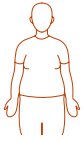
Prevalence

OSA is highly prevalent with an estimated 30.5% of people in Singapore having moderate-severe OSA, of which up to 91% are undiagnosed.⁵

RISK FACTORS

Risk factors of OSA include:

Obesity



Obesity is a major risk factor for OSA. Obesity-induced upper airway changes lead to airway narrowing and collapsibility during sleep.⁶

Ageing



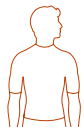
Ageing is another important risk factor. Ageing results in greater upper airway collapsibility and reduced upper airway muscle reflex response.⁷

Certain craniofacial abnormalities



Certain craniofacial abnormalities such as tonsillar hypertrophy⁸ and small mandible also result in an anatomically narrow upper airway and higher rates of OSA.⁹

Gender



Men are twice as likely to have OSA than women.¹⁰

However, OSA is not just an anatomical disease. **Non-anatomical factors** also contribute in various degrees to the development of OSA in individual patients, including:¹¹

- The responsiveness of the upper airway muscles (how well the upper airway muscle tone is maintained during sleep)
- The sensitivity of the ventilatory control system (how well breathing is regulated – an oversensitive system leads to periods of overbreathing and consequent periods of apnoea)
- A low respiratory arousal threshold (being easily awakened in response to a mild reduction in airflow)

OSA is a heterogeneous disease with variability in pathophysiology, clinical presentation and treatment response. More work is required to understand the disease better, to aid development of individualised therapy.¹²

CLINICAL PRESENTATION

The most common symptom of OSA is **excessive daytime sleepiness**.

Other common symptoms include:

- Snoring
- Witnessed apnoeic episodes
- Waking up choking or gasping
- Frequent nocturia due to sleep arousal

While the typical profile of an OSA patient is male, middle-aged, overweight and snores loudly, it is important to be aware that **OSA can present in a variety of ways**.

- **Women** with OSA are more likely to complain of symptoms of frequent awakening (sleep maintenance insomnia), restless legs, depression and nightmares rather than snoring and apnoeic episodes.¹³
- **Elderly patients** have a normal advancement in circadian rhythm in which they tend to sleep earlier, wake up earlier and sleep shorter hours. Elderly patients also have higher rates of symptoms such as nocturia and reduced energy levels.

Thus, symptoms such as insomnia, frequent daytime naps and nocturia can easily be mistaken as part of the functional impairments of ageing, or the effects of disease or medications. Elderly patients may also present with predominantly neurocognitive effects such as poor memory.^{4,7}

Although excessive daytime sleepiness is the most common symptom, cohort studies have shown that there are subsets of patients who are **asymptomatic** despite sleep disruption from OSA.¹⁴

Diagnostic Sleep Studies

If a patient has symptoms suggestive of OSA, they should be referred for a sleep study.

1. IN-LABORATORY POLYSOMNOGRAPHY

How it is performed

An in-laboratory polysomnography (PSG) is the standard diagnostic test.

Patients are admitted overnight for the study. A PSG is performed with continuous measures of

airflow, respiratory effort, pulse oximetry, electroencephalogram, chin electromyogram, electrooculogram, body position and leg movement during sleep. It can diagnose OSA and other respiratory or non-respiratory sleep disorders.

2. HOME SLEEP STUDY

How it is performed

Home sleep studies are increasingly being used for the diagnosis of OSA as well. These tests can be conducted in the convenience of the patient's own home. It utilises fewer signals than a PSG, typically including measures of airflow, respiratory effort and pulse oximetry or peripheral arterial tonometry (PAT) with oximetry and actigraphy.

Accuracy and limitations

Home sleep studies have good sensitivity (79% [95% CI, 71-86%]) and specificity (79% [95% CI, 63-89%]) for moderate-severe OSA¹⁵ and **can be used accurately in patients with a high pre-test probability of OSA.**

However, its accuracy goes down in patients who have a low pre-test probability of OSA.

Without the range of signals available in a PSG, home sleep studies are also not able to diagnose other sleep disorders aside from OSA (e.g., hypoventilation, periodic limb movement disorder).¹⁶

When it should be used

Therefore, home sleep studies should primarily be used to diagnose OSA in patients with a **high clinical suspicion** of OSA and **no other suspected sleep disorders.**

Practice guidelines from the American Academy of Sleep Medicine define a high clinical suspicion of OSA as patients who have excessive daytime sleepiness **and** two of the three criteria below:

- Snoring
- Witnessed apnoea or choking or gasping
- Hypertension

As false negative home sleep studies can occur, a negative home sleep study in patients with a high clinical suspicion of OSA should be followed by an in-laboratory PSG.¹⁵



Treatment Options

The treatment decision depends on the patient's symptom severity, severity of OSA, BMI, phenotypic traits, comorbidities and personal wishes.

1. CONTINUOUS POSITIVE AIRWAY PRESSURE (CPAP) THERAPY

What it is

CPAP is the primary treatment for symptomatic OSA. It is delivered via a nasal or oronasal mask, and the pressure acts to splint the airway open during sleep.

Efficacy

CPAP is effective in **reducing the apnoea-hypopnoea index (AHI), improving daytime sleepiness and improving neurocognitive outcomes**.^{17,18} The treatment effect of CPAP is the greatest in patients who have higher levels of daytime sleepiness and thus should be offered to all patients who are symptomatic.

CPAP has also been shown in studies to **reduce blood pressure**. The treatment effect is modest but higher in the subset of patients with resistant hypertension (mean reduction in systolic blood pressure 5.06 mmHg, diastolic blood pressure 4.21 mmHg).¹⁹

CPAP and cardiovascular disease

Despite the association of OSA with cardiovascular disease, a recent large randomised controlled trial (RCT) (the Impact of Sleep Apnea syndrome in the evolution of Acute Coronary syndrome [ISAACC] trial) has failed to show that the use of CPAP in patients with acute coronary syndrome reduces future cardiovascular events.²⁰

A major limitation of the study is that patients with excessive daytime sleepiness were excluded and there was a low adherence to CPAP therapy (2.78 hours/night).

As the degree of excessive daytime sleepiness is correlated with an increased risk of cardiovascular

disease²¹, the exclusion of sleepy patients may underestimate the treatment effect of CPAP.

However, from this RCT as well as earlier trials^{22,23}, the current evidence suggests that CPAP therapy does not reduce cardiovascular risk in asymptomatic or minimally symptomatic patients.

Nevertheless, screening may still be appropriate in a subset of patients with resistant hypertension, pulmonary hypertension and recurrent atrial fibrillation after cardioversion or ablation.²⁴

Importance of CPAP adherence

As previously alluded to, **the benefits of CPAP are highly dependent on adherence**; more hours used per night is associated with greater improvement in symptoms and function.²⁵

Unfortunately, acceptance of and compliance to CPAP therapy is challenging.

In a study performed at Changi General Hospital, only 34.8% of patients with newly diagnosed OSA opted to try CPAP and only 50.7% continued therapy after the initial trial period. However, in those who continued CPAP, 78.5% were adherent after one year.²⁶

Predictors of compliance to CPAP include severity of OSA, severity of excessive daytime sleepiness, psychosocial factors and side effects.²⁷

CPAP adherence can be improved through patient (and bed partner) education, patient engagement, troubleshooting side effects and cognitive behavioural therapy.²⁷ Thus, these are essential components of CPAP therapy and follow-up service.

Treatment Options (Continued)

2. SURGERY

Who can benefit from surgery

Surgery is suitable for selected patients. It can be used as:

- **An adjunct to facilitate CPAP therapy in patients with inadequate CPAP adherence due to pressure-related side effects**

Surgery to facilitate CPAP therapy involves nasal, tonsillar or palatal surgery to increase the patency of the upper airway in patients who have significant CPAP pressure-related side effects. By widening the airway, CPAP pressure requirements are reduced, resulting in improved patient adherence to therapy.³⁰

- **Sole treatment for OSA in patients who are intolerant of CPAP or have surgically amenable upper airway abnormalities (such as tonsillar hypertrophy or maxillomandibular abnormalities)²⁸**

For patients with surgically amenable upper airway abnormalities, surgery can be effective. For example, in patients with tonsillar hypertrophy, tonsillectomy normalises AHI for 57.4% of patients, reduces AHI by more than half in 85.2% of patients and improves daytime sleepiness.³¹

In most cases, even in patients with significant craniofacial abnormalities, a trial of CPAP therapy

prior to surgery is usually performed as it carries minimal risk relative to surgery.²⁸

Pre-surgery assessment

Surgery for OSA is individualised. Various manoeuvres are performed during nasoendoscopy to assess the collapsibility of the airway, identify the area of obstruction and test the effect of surgery.

If the site of obstruction is not identified during awake endoscopy, evaluation may be performed with drug-induced sleep endoscopy (DISE), which has been shown to alter surgical decisions in a significant proportion of patients.²⁹

Hypoglossal nerve stimulation

Hypoglossal nerve stimulation is a relatively newer form of surgical treatment for moderate-severe OSA.

An electrode is placed near the hypoglossal nerve and controlled by a stimulator implanted on the chest. In response to respiratory effort detected via a pressure sensor, the stimulator activates the hypoglossal nerve causing tongue protrusion and maintaining upper airway patency.

Upper airway stimulation reduces the median AHI from 29.3 to 9 events per hour and improves daytime sleepiness.³² Sustained benefit is seen at five years follow-up.³³

3. ORAL APPLIANCE

What it is

Mandibular advancement devices (MAD) are the most common oral appliances used for OSA and should be custom-fitted by a dentist trained in dental sleep medicine.³⁴ They consist of braces that cover the upper and lower teeth. The lower teeth (and mandible) are then advanced forward resulting in increased upper airway volume. The degree of advancement is titrated to patient tolerance and a follow-up sleep study is usually performed to confirm treatment efficacy.

Efficacy

MADs are an effective form of treatment for patients with mild-moderate OSA and are well tolerated by patients.

While MADs reduce AHI less than CPAP therapy (mean reduction in AHI of 13.6 events per hour), they are associated with greater compliance and thus improve daytime sleepiness to a similar degree.³⁴ MADs are therefore a useful alternative in patients who are intolerant of CPAP.

Treatment Options (Continued)

4. POSITIONAL THERAPY AND MYOFUNCTIONAL THERAPY

Positional therapy

In patients whose OSA is predominantly in a supine position and less in the lateral position (positional OSA), sleeping on one's side is an effective treatment with good compliance.³⁵

Various devices such as specifically designed pillows or supine vibration alarm devices are available to help restrict sleep to the side.³⁶

Myofunctional therapy

Myofunctional therapy consists of combinations of oropharyngeal exercises involving the palate, tongue and facial muscles. It improves snoring and daytime sleepiness.³⁷

It is inferior to CPAP therapy but may have a role to play in patients who are CPAP-intolerant.³⁷ Used as an adjunct in combination with CPAP, myofunctional therapy also results in improved CPAP compliance.³⁸

5. LIFESTYLE MODIFICATION

Lifestyle modification such as **exercise and weight management** are important interventions not to be forgotten.

Weight loss

In OSA patients who are overweight or obese, weight loss decreases OSA severity and improves daytime sleepiness, snoring and general health.

There is no threshold amount of weight loss needed; greater weight loss is associated with greater benefit.³⁹

Exercise

Exercise by itself can also improve OSA. In a small trial, subjects who performed 30 minutes of moderate-intensity walking a day, five days a week, have a mean reduction in AHI of 10.6 events per hour.⁴⁰

Importantly, this benefit occurs independently from a change in weight and thus can be prescribed even to non-obese individuals with OSA.

Minimising alcohol and medications

Alcohol and medications such as benzodiazepines and opioids may worsen OSA and should be minimised or avoided.

GP REFERRALS TO THE SINGHEALTH DUKE-NUS SLEEP CENTRE



If OSA is suspected, GPs may refer patients to a specialist centre such as the SingHealth Duke-NUS Sleep Centre for an assessment.

The SingHealth Duke-NUS Sleep Centre, which sees patients at six clinical sites across SingHealth institutions, is the largest multidisciplinary sleep service in Singapore and is staffed by specialists from ENT surgery, respiratory medicine, neurology, psychiatry, psychology and dentistry – all of whom have undergone further specialised training in the field of sleep medicine locally and abroad.



TAKE-HOME MESSAGES

- ★ OSA is a common condition and many patients are undiagnosed.
- ★ Women and elderly patients with OSA may present without typical symptoms.
- ★ Home sleep studies can be used to accurately diagnose, but not rule out, OSA in patients with a high clinical suspicion of OSA and no other suspected sleep disorder.
- ★ Symptomatic patients appear to benefit the most from OSA treatment.
- ★ Lifestyle modification such as exercise and weight management should not be forgotten as a form of treatment for OSA.
- ★ CPAP is the primary therapy for OSA, but adherence is often suboptimal. Alternative treatments such as surgery, oral appliances, positional therapy and myofunctional therapy are available.



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To view all references, please refer to the online version of *Defining Med* by scanning the QR code on the cover page.



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National Dental Centre Singapore
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National Neuroscience Institute
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Bruxism – Is It Just Noise?

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What are the different types of bruxism, what should general practitioners look out for, and what are the keys to effective patient management? The SingHealth Duke-NUS Sleep Centre shares all about how bruxism can be managed in primary care.

WHAT IS BRUXISM?

Awake bruxism vs. sleep bruxism

In the International Classification of Diseases 10th Revision (ICD-10), bruxism is classified into **awake bruxism (AB)** and **sleep bruxism (SB)**.

- In **AB**, there is repetitive jaw muscle activity with clenching of teeth in the daytime
- **SB** is characterised by repetitive rhythmic (phasic) tooth-grinding and/or sustained (tonic) masticatory muscle tooth-clenching activity during sleep

The two conditions, AB and SB, are aetiologically distinct. The latter is a **parasomnia**, an undesirable sleep-related phenomenon.

When does bruxism become a disorder?

In healthy individuals, bruxism is a behaviour and not a disorder.

Bruxism becomes a disorder when it is symptomatic with medical and dental comorbidities, namely:

- Headache
- Orofacial pain
- Temporomandibular disorders (TMD)
- Excessive tooth wear
- Tooth fractures
- Rapid progression of periodontal disease

Primary vs. secondary bruxism

Primary bruxism exists without pre-existing medical conditions or medication, whereas secondary bruxism is associated with:

- Diseases or disorders such as:
 - Obstructive sleep apnoea (OSA)
 - Insomnia
 - Periodic limb movements of sleep (PLMS)
 - Rapid eye movement (REM) behaviour disorder (RBD)
- **Or** medical comorbidities such as:
 - Sleep epilepsy
 - Parkinson disease
 - Gastro-oesophageal reflux disease (GERD)

Secondary bruxism can be substance-induced by anxiolytic, antipsychotic or antidepressant medications, and stimulants such as tobacco, caffeine, alcohol or recreational drugs.



PREVALENCE

Bruxism is common with a higher prevalence in children than adults.

AB occurs in approximately 22% to 30% of adults. SB is more common in children and its prevalence decreases as the child matures – from 49% in children to 15% in adults, and to 3% in those over 60 years of age.

The sleep stage in which SB events occur is important.

- The garden variety SB, experienced by the majority, occurs during light non-rapid eye movement (NREM) sleep and can be asymptomatic.
- Destructive bruxism with severe symptoms occurs in approximately 10% of individuals with SB during the REM phase of sleep.

RISK FACTORS

The risk of bruxism can be inherited, and between 20% to 50% of those with SB report at least one immediate family member with a history of the condition. The odds ratio for SB increases in association with the following:

- OSA
- Loud snoring
- Heavy alcohol intake
- Caffeine consumption
- Smoking
- High stress and anxiety
- Competitive personality

DIAGNOSTIC INVESTIGATIONS

The diagnosis of bruxism may involve the following:

1. Medical history taking

The patient's medical history will be taken, including any neurodegenerative diseases, neurodevelopmental disorders, epilepsy, GERD, sleep disorders, sleep parasomnias, and medication for anxiolytic, antipsychotic and antidepressant therapy.

2. Looking at signs and symptoms

Daytime sleepiness, transient morning headaches, jaw and muscle pain or fatigue, and presence of abnormal tooth wear are the discriminatory items with high concordance for SB diagnosis.

Others to look out for are scalloped tongue edges, linea alba or white lines in the buccal mucosa, torus mandibularis or torus palatinus, which are hard bony exostoses of the upper and lower jaws.

3. Overnight polysomnography

The overnight polysomnography (PSG) is the gold standard for confirmation of SB diagnosis.



MANAGING BRUXISM

While there is no cure for bruxism, it can be treated to manage its severity and consequences.

Patient management is complex and addresses the main concerns, associated sleep disorders, orofacial pain and prevention of damage to teeth and gums.

SB TREATMENT: THE 5'P's

1. Prevention

Patient education in sleep hygiene, relaxation, coping with anxieties and stresses, and avoiding risk factors such as consumption of stimulants (e.g., nicotine, alcohol, caffeine and recreational drugs) is important.

In medication-induced bruxism, a change in prescription or the use of a customised dental splint or tooth protector is advised.



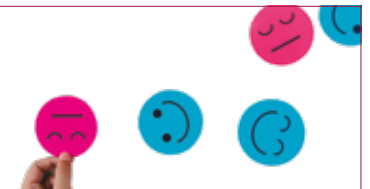
2. Patient counselling

This involves training patients in self-monitoring and reversal of behaviours and habits.



3. Psychological or psychiatric interventions

This includes stress management, cognitive behavioural therapy (CBT) and biofeedback methods.



4. Pills

These pharmaceuticals include muscle relaxants, analgesics, anxiolytics, benzodiazepines and botulinum toxin injections of the masseter and temporalis muscles to reduce muscle tension and pain.



5. Plates

Plates are removable dental splints almost similar to customised retainers. They are fitted over the upper or lower teeth, or both.

The aim is to unload, stabilise and improve the functions of the temporomandibular joints (TMJ), reduce abnormal muscle activity and muscle pain, and protect teeth, restorations and TMJ.

Two-jaw dental splints with mandibular advancement, or a single-jaw dental splint with continuous positive airway pressure (CPAP) therapy, can be used to manage OSA and SB concurrently.



WHEN GPs SHOULD REFER

General practitioners may consider sending patients to be assessed and sleep-tested for bruxism if they have:

- Frontal headaches on waking up
- Orofacial or masseter/temporalis pain
- TMD
- GERD
- Daytime sleepiness/tiredness and snoring

Integrated multidisciplinary medical and dental management can best address the multiple problems of patients with symptomatic bruxism.

The SingHealth Duke-NUS Sleep Centre offers these services at its clinical sites at the National Dental Centre Singapore, Singapore General Hospital, Changi General Hospital and Sengkang General Hospital, as well as at KK Women's and Children's Hospital for children under 16 years of age.



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How to Help Children and Adolescents Optimise Sleep Hygiene

Dr Cheng Zai Ru | Staff Physician, SingHealth Duke-NUS Sleep Centre;
Respiratory Medicine Service, KK Women's and Children's Hospital

The importance of good sleep habits and positive sleep practices in children and adolescents cannot be overstated. Read on for a rundown of practical tips and resources that general practitioners can use to help young patients optimise their sleep hygiene.

THE IMPORTANCE OF SLEEP HYGIENE

It is lousy to be drowsy – a fact well known to everyone both young and old, when the irresistible urge to sleep occurs at inopportune moments for children, resulting in poor school attendance, deteriorating academic performance and emotional dysregulation.

Positive sleep practices and good sleep habits fall under the term '**sleep hygiene**' – which often entails common empirical knowledge, but in reality is less likely to be adhered to especially when distractions are abundant.

A need to start young

The pressing need to optimise sleep hygiene starts right from early childhood, as today's exhausted kids strive for excellence in both academic and extra-curricular pursuits.

Sleep hygiene often takes a backseat particularly in adolescents, amidst competing priorities associated with their preoccupation with body image, self-identity creation, peer acceptance and known preponderance for risk-taking behaviours.

The **4** Keys to Positively Promote Sleep in Children and Adolescents

Here are some helpful tips to optimise sleep hygiene in children and adolescents, focusing on four categories of behaviours that positively promote sleep.

- 1. Regulation of sleep**
(synchronising sleep drive and circadian rhythm)
- 2. Conditions that aid sleep**
- 3. Winding down for sleep**
- 4. Achieving optimal quantity and quality of sleep**



1. Regulation of sleep

The sleep-wake cycle in humans is governed by two processes: one's innate homeostatic sleep drive and the body's 'internal clock' known as the circadian rhythm.

- The body's **sleep drive** is dependent on the accumulation of sleep pressure, which starts from the time of the last sleep episode, increasing in strength until it is met with the next sleep opportunity.
- The **circadian rhythm** for sleep runs in the background independent of a sleep episode, relying on the 'master clock' known as the suprachiasmatic nucleus (SCN). This master clock is tied to environmental cues such as exercise, social activity, temperature and especially light exposure.

The following practices help regulate the internal clock and synchronise the sleep-wake cycle:

A. Consistent sleep-wake pattern

- A consistent bedtime and wake time that differs by no more than an hour between weekdays and weekends is advised.
- Dealing with multiple curtain calls and bedtime-delaying tactics is a rite of passage for parents of pre-schoolers. Ensuring a regular daily schedule that includes set meal times and consistent bedtime routines not lasting more than 30 minutes before lights out is key.
- Wake times may be delayed on non-school days such as weekends or holidays, especially in adolescents who are known late-risers, and efforts should be made to ensure that this is delayed to no later than 9 or 10am.

B. Napping schedule

- Late naps beyond 3.30pm are ill-advised as they do not provide sufficient time for a child's sleep drive to accumulate by bedtime, potentially delaying it.
- Nap schedules should be age-appropriate and consistent in place and timing. Many children start dropping their daytime naps between the ages of three and five years old. Hence, flexibility in adjusting to slightly earlier bedtimes can be helpful in accommodating this phase as the child's sleep drive may start peaking earlier in the evenings.

C. Environmental light exposure

- During the day, light exposure causes the master clock to send signals that generate alertness, promoting wakefulness and activity. Light-induced activation of the SCN prevents the production of melatonin by the pineal gland.

As night falls, the master clock initiates melatonin production and then keeps transmitting signals that help maintain sleep through the night.

- The sleep-promoting role of melatonin must be leveraged in the evening to allow it to peak appropriately just before bedtime.

Avoidance of evening direct light exposure is advised. A dim night light for children can be comforting and is appropriate, provided it does not shine directly into the child's eyes.

- Conversely, light exposure in the morning is encouraged for melatonin suppression and to generate alertness. Morning sun exposure through outdoor play or morning jogs can further help regulate the internal clock.



2. Conditions that aid sleep

A. Having a bedtime routine

- Children take comfort in routines. Bedtime routines should involve the usual three to four activities that start furthest away from the bedroom and finally end in bed.
- For example, taking a bath or changing into pyjamas, followed by the brushing of teeth, and then the reading of a story book or singing of a lullaby before lights out. This should take no longer than 20 to 30 minutes to complete.
- A bedtime routine pictorial chart depicting the activities that take place, accompanying a reward chart on tasks achieved that culminates in a weekly reward can help promote adherence in children who are developmentally able to understand the concept of rewards and delayed gratification.

B. Avoiding activities in bed other than sleep

- Screen use for texting, gaming and viewing of exciting or horror TV programmes in the bedroom should be discouraged as such stimulating activities promote wakefulness.

C. Avoiding using the bed as punishment

- Timeouts with the bed as a punishment may cause the child to develop a negative association with the bedroom environment, and hence should be avoided.

D. Keeping the bedroom as the sole place for sleep

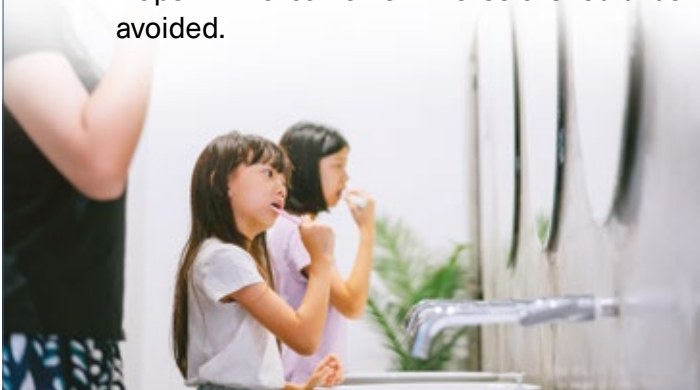
- Naps in the car or on the sofa should be avoided.

3. Winding down for sleep

Screen devices in the bedroom have been associated with increased sleep problems and emotional or behavioural difficulties in young children, particularly in children with neurodevelopmental disorders.

In helping a child wind down for sleep, the following measures are recommended:

- Keep electronic devices such as mobile phones and television sets (and their remote controls) outside of the bedroom.
- Avoid play activities or exercises that are too stimulating closer to bedtime.
- Heavy meals should be avoided one to two hours before bedtime as this can interfere with digestion, increasing the risk of reflux and affecting sleep onset.
- Be aware of certain beverages, sweets, chocolates and ice cream flavours that contain caffeine and limit or eliminate them from the child's diet in the late evening or night.
- Relaxing activities such as reading, storytelling and singing in soothing tones can be included in the bedtime routine.



4. Achieving optimal quantity and quality of sleep

- For optimal sleep quality, families should aim for a match between the child’s sleep need, sleep opportunity and amount of sleep obtained.
- Bedtimes should be developed with the child and caregivers, appropriate for the child’s age and development.
- Wake times should be designated to allow ample opportunity for sufficient sleep duration.
- One must take into account that inter-individual variations for amount of sleep required exist, attributed to factors such as neurodevelopment, genetic factors and tolerance for sleep deprivation.

The table below shows the 2016 American Association of Sleep Medicine (AASM) guidelines for age-related recommendations on sleep duration:

Age	Recommended sleep hours per day
Infants (4-12 months)	12 to 16 hours (including naps)
Toddlers (1-2 years)	11 to 14 hours (including naps)
Pre-schoolers (3-5 years)	10 to 13 hours (including naps)
Children (6-12 years)	9 to 12 hours
Teens (13-18 years)	8 to 10 hours

- The child’s bedroom environment should be purposed for sleep, with low light levels and noise, cool ambient room temperatures and safe sleeping surfaces that are age appropriate.



TIPS FOR SLEEP HYGIENE: A SUMMARY



- Have a consistent bedtime and wake time
- Have a consistent bedtime routine
- Get appropriate light exposure during daytime
- Avoid excessive direct light exposure at night
- Have age-appropriate naps, avoiding napping in the late afternoon / evening
- Associate the bedroom only with sleeping
- Avoid exercise or excessive screen time closer to bedtime
- Avoid heavy meals and caffeine-containing food/ beverages closer to bedtime
- Promote calming/relaxing activities closer to bedtime



USEFUL RESOURCES FOR GPs TO HELP OPTIMISE SLEEP HYGIENE

1. Sleep diary

A sleep diary is useful to track the child's sleep habits across a period of one to two weeks. Once actual sleep patterns are established and known to both the caregiver and healthcare professional, only then can lifestyle modifications and behavioural advice be appropriately implemented, and improvements to the child's sleep tracked over a period of time.

A sample sleep diary can be found at www.sleepfoundation.org/sleep-diary.

2. Epworth Sleepiness Scale

The Epworth Sleepiness Scale for children and adolescents (ESS-CHAD) is a helpful representation of the level of daytime somnolence experienced by the patient based on a score. The resource and score interpretation of this simple-to-use eight-item questionnaire can be found at <https://epworthsleepinessscale.com/about-the-ess-chad>.

3. Reward charts and sleep information resources for children and teenagers

Available at www.healthhub.sg/programmes/183/parent-hub/preschool/good-sleep-captain-sleep.

WHEN GPs SHOULD REFER A PATIENT



It is well known that a child's temperament, sleep difficulties and parental reactions all interact in a reciprocal manner to produce or maintain sleep problems. Optimising sleep hygiene in children and adolescents remains an important first step in helping a family cope with sleep issues.

A referral to a sleep clinic can be considered when:

- It is established that there is a severe impact on the child or family members' daytime functioning due to poor sleep quality or quantity that has not improved with the above discussed measures, *and/or*
- A sleep disorder (e.g., obstructive sleep apnoea, parasomnia) is suspected

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Lymphoedema After Breast Cancer Treatment

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With advances in technology, lymphoedema is now considered an unnecessary evil for breast cancer patients post-treatment. General practitioners have an important role to play in reducing their risk of lymphoedema through increased patient awareness, proper precautions and timely detection.

INTRODUCTION

Before the twentieth century, the radical Halsted mastectomy was considered the gold standard in the treatment of breast cancer. Patients may have survived, but they did not live well as many were left scarred with disfiguring wounds and significant morbidities.

These women suffered a profound, debilitating impact on their affected chests and the functions of their shoulders and arms, resulting in persistent suffering of pain, numbness and swelling with little means of relief.¹ It was an ironic reminder of their so-called victory over cancer, or the 'necessary evil'.

In recent years, there has been a paradigm shift in the aims of breast cancer treatment – to not merely achieve the best oncological outcomes but also **focus on improved quality of life** for cancer survivors in tandem.

WHAT IS LYMPHOEDEMA?

A potential morbidity of any lymph node surgery is lymphoedema, the **swelling of the draining limb due to disruption of lymph flow**.

As axillary surgery is an integral part of staging and providing locoregional control of breast cancer, it is almost routinely performed. Lymphoedema is estimated to affect up to 20% of breast cancer patients and occurs within the first few years of treatment.

SYMPTOMS OF LYMPHOEDEMA

Most cases of lymphoedema **present with mild symptoms and are potentially reversible**, but in advanced cases, it **can cause severe limitations** to the function of the affected breast and limb, resulting in pain, swelling or recurrent infections.

A patient with a swollen arm due to lymphoedema (*Figure 1*) not only has a higher risk of cellulitis and other debilitating symptoms such as pain or numbness, but also experiences inconvenience in many aspects of daily living such as finding fitting clothes or wearing jewellery.



Figure 1 A patient with a marked swollen right arm due to breast cancer related lymphoedema, who can only wear jewellery on the unaffected wrist.

These patients may need:

- Ongoing manual lymphatic drainage
- To wear compression garments which are extremely uncomfortable in our warm climate
- To undergo surgical procedures to restore lymphatic flow and minimise damage from chronic lymphoedema

This potential health burden is often given much less consideration during the initial stages of cancer diagnosis and in the treatment decision-making process.

THE DE-ESCALATION OF AXILLARY SURGERY TO REDUCE LYMPHOEDEMA RISK

With our improved understanding of cancer biology, doing 'more' does not always lead to better results. In fact, by choosing the right treatment strategy, we could see an overall improved quality of life with decreased morbidities, and have similar long-term survival outcomes.

From axillary clearance to sentinel lymph node biopsy

Traditionally, axillary clearance (AC) was performed to remove all the lymph nodes in the axilla regardless of whether there was disease in the draining nodes. However, it was quickly apparent that it did not convey survival benefits in patients who did not appear to have cancer in the axilla.

A **less invasive yet accurate procedure of sentinel lymph node (SLN) biopsy** quickly replaced AC as the gold standard procedure for such patients.

Omitting AC in favour of radiotherapy

When cancer was detected in any of the SLN, an AC was still routinely performed to eradicate cancer in the nodal basin.

However, this practice was also challenged when the results of the landmark trials such as the American College of Surgeons Oncology Group (ACOSOG) Z0011 trial and the AMAROS trial showed that we

could reliably avoid axillary dissection in favour of **radiotherapy for a subset of patients with early, low-risk breast cancer and limited nodal disease** – without causing any difference in survival benefits, and yet lowering the incidence and severity of lymphoedema.^{2,3}

Neoadjuvant chemotherapy to test tumour biology – to avoid AC in complete responders

In patients with established nodal disease, another strategy to de-escalate axillary surgery in breast cancer management involves the use of **neoadjuvant chemotherapy (NACT)**. This is particularly suitable for cancer subtypes known to respond favourably to it, such as:

- HER2-positive tumours
- Triple-negative tumours
- Higher-grade tumours

Figure 2 shows an enlarged pathological lymph node (A) which was marked with a sonographically visible clip and showed shrinkage (B) after NACT. The clipped lymph node was then identified by ultrasound localisation and retrieved as SLN, which corresponds to the node with blue (C) and fluorescent indocyanine green (D) uptake.

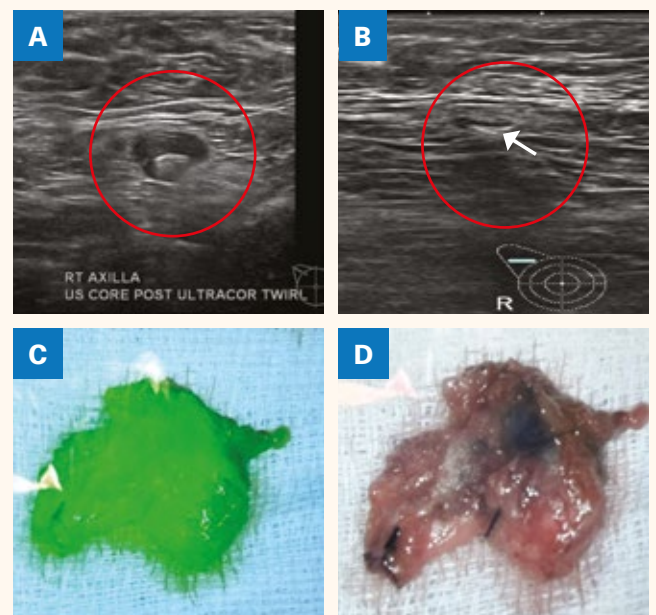


Figure 2

Targeted axillary lymph node dissection to spare patients from AC

Targeted axillary lymph node dissection (TALND) is a modified axillary staging technique which combines the conventional SLN biopsy with pre-treatment localisation of the involved nodes.

Should there be good clinical response after NACT such that no obvious nodal disease remains, this targeted approach would spare the patient from the morbidity of a traditional AC, and have similar efficacy in terms of axillary staging and long-term survival outcomes.

Omission of axillary staging if it does not affect management

Lastly, in situations whereby additional axillary staging information may not influence prognosis or treatment, the decision to omit axillary surgery can be undertaken safely after discussion in a multidisciplinary setting with input from treating medical and radiation oncologists.

This may be applicable to a small proportion of patients with otherwise very favourable tumours, or patients with poorer prognosis and who would unlikely benefit from any other adjuvant systemic therapy and/or radiotherapy.

THE OTHER EVIL: MYTHS ABOUT PREVENTATIVE MEASURES AND RISK OF LYMPHOEDEMA

It is advisable to take the necessary preventative measures for at-risk limbs. Risk factors like a raised BMI and recurrent arm infections should be addressed.

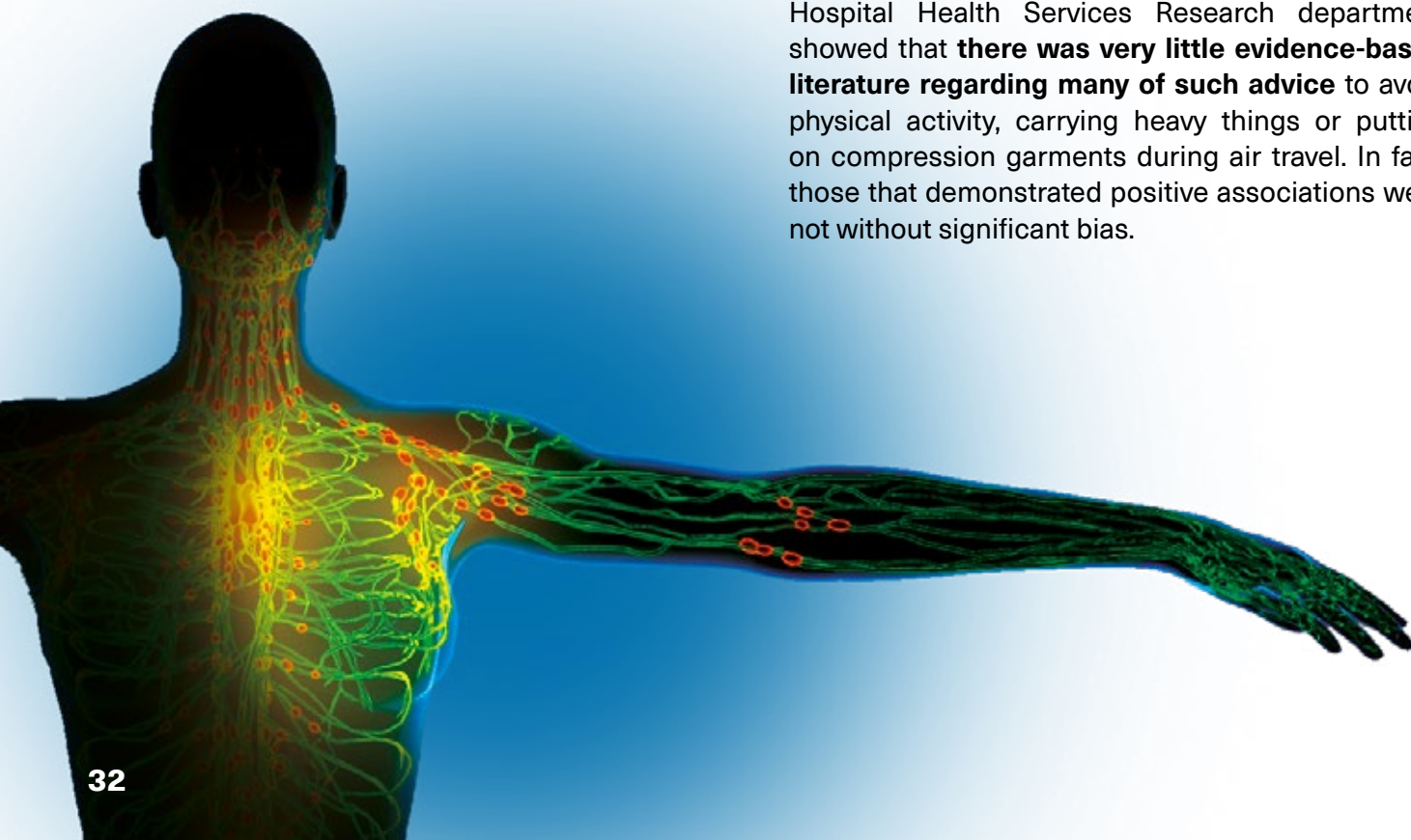
This is especially since any form of axillary surgery, chemotherapy and radiation to the lymph nodes could increase the patients' chances of developing lymphoedema and put them at risk.

The unnecessary evil of misinformation

However, when there is frequent association of certain practices and lymphoedema, a causal relationship becomes falsely perpetuated by anecdotal or poor-quality evidence. **The perceived threat or unwarranted restrictions could also become an unnecessary evil.**

For instance, some patients and clinicians may caution about developing lymphoedema from air travel, physical activity, compression garments, blood pressure taking, venepuncture – and the list goes on.

A literature review conducted by the Changi General Hospital Health Services Research department showed that **there was very little evidence-based literature regarding many of such advice** to avoid physical activity, carrying heavy things or putting on compression garments during air travel. In fact, those that demonstrated positive associations were not without significant bias.



HOW GPs CAN ADVISE AT-RISK PATIENTS



We recommend **three easy and evidence-based principles** to safeguard against lymphoedema for those at risk (adopted from the National Lymphedema Network Position statement)⁵.

1. Appropriate skin care to avoid trauma and injury to the at-risk limb to reduce infection risk, if possible

This includes:

- Applying moisturisers to prevent chapping/ chafing of the skin and paying attention to nail care
- Wearing protective garments when doing activities that may cause injuries (e.g., washing dishes, gardening or working with tools/chemicals)
- If any scratches or punctures should occur, attending to the wound appropriately (e.g., washing with water and soap and observing for signs of infection)
- Seeking medical attention early if there are signs of possible infection such as fever, swelling, redness or pain
- Avoiding excessive or prolonged constriction – including from poor-fitting blood pressure cuffs or garments, or extremes of temperature that can result in tissue injury

2. Maintaining a healthy weight

A high BMI is a known risk factor for developing lymphoedema. Patients should always adopt regular exercise and a healthy diet in their lifestyles and build up the duration and intensity of activity safely. There is no physical limitation to what an at-risk limb is allowed to do.

3. Regular surveillance for lymphoedema

Report any changes to your at-risk limb such as an increase in size or a change in sensation, colour, temperature or skin condition.

While there may be variations in healthcare policies among various medical facilities regarding the at-risk limb, every healthcare professional should make a reasonable attempt to protect any limb that the patient identifies as being at risk.

If, however, in a medical emergency or when there is no uninvolved limb, healthcare professionals should **address the medical priority**, take reasonable precautions **to address patients' concerns** properly and take appropriate actions to **monitor for swelling**.

SURVEILLANCE AND EARLY INTERVENTION AFTER TREATMENT

Looking out for signs and symptoms

Early detection is another key to the management of lymphoedema.

The majority of cases occur within the first few years of surgery. When detected in its early stages, the condition tends to be reversible and cause less detriment to quality of life.

It is hence recommended to screen for the signs and symptoms of lymphoedema (*Table 1*).

Screening for signs and symptoms of lymphoedema - PESTS

Pain
Elevate the arm (check for weakness, restricted range of motion)
Swelling (heaviness, affecting self-image)
Tightness (wearing garments)
Skin infection

Table 1

Taking pre-treatment limb measurements

Pre-treatment limb measurements are recommended to be taken as a baseline and at regular intervals, either by treating clinicians or trained lymphoedema assessors.

The surveillance strategy can be done through:

- Cost-effective methods such as taking the arm circumference
- Using specialised tools such as:
 - A perometer which calculates limb volume
 - Bioimpedance spectroscopy which analyses the composition of fluid compartment in the body to detect early lymphoedema in the at-risk limb

CONCLUSION

With an increased awareness about lymphoedema, we can educate patients, the community and healthcare professionals to better manage this potential complication brought about by breast cancer treatment.

In conclusion, it is time to not only rethink about the priorities of cancer treatment, but also to weigh the value of every treatment against its potential harms, and be aware of the strategies to avoid the unnecessary evil as much as possible.

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Clin Asst Prof Jeffrey Hing Jun Xian

Consultant, SingHealth Duke-NUS Breast Centre;
Department of Surgery;
Department of Breast Surgery, Changi General Hospital

Clinical Assistant Professor Jeffrey Hing Jun Xian is a Consultant Breast Surgeon at Changi General Hospital (CGH). He completed his overseas fellowship in Korea and Japan where he trained under various pioneers in the field of minimally invasive and oncoplastic breast surgery. He believes in supporting his patients to make balanced and well-informed decisions in their treatment journey and delivering the best possible outcome with every surgery.

He is appointed Clinical Assistant Professor at Duke-NUS Medical School and is the clinical lead for students from the Lee Kong Chian School of Medicine in CGH General Surgery.



GPs can call the **SingHealth Duke-NUS Breast 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

KK Women's and Children's Hospital
6692 2984

National Cancer Centre Singapore
6322 9399



The New National Cancer Centre Singapore Geared to Meet Future Healthcare Needs

The new 24-storey National Cancer Centre Singapore (NCCS) building has been fully operational since March 2023. This is welcome news as NCCS serves as the national specialty centre for oncology that sees the majority of cancer cases in the public healthcare sector.

With a rapidly ageing population and the rising incidence of cancer, the 92,000 square metre NCCS building, which is five times larger than its previous premises, is geared to meet the nation's future healthcare needs.






IMPROVED ACCESSIBILITY AND CONVENIENCE

The new NCCS is located on the Singapore General Hospital Campus along Outram Road, and is easily accessible via public transport with a sheltered link bridge from Exit 7 at Outram Park MRT station which connects directly to NCCS.

PATIENT-CENTRIC DESIGN

Designed with a patient-centric approach, the new NCCS has clinical services, research, education, rehabilitation and supportive care under one roof, to facilitate patient flow and enhance patient experience.

Legend

-  Orange Campus Shuttle Service
-  Bus Stop
-  Link Bridge
-  Car Park
-  Taxi Stand



Enhanced Capacity and Capabilities

64 consultation rooms | **108** recliner chairs and beds for chemotherapy

- Boosted capacity for outpatient cancer care, almost double compared to the old premises
- Integrated day surgery and endoscopy services for holistic care

Almost **10,000 m²** of research space

- Houses translational research facilities and expanded early-phase clinical trial capabilities to offer patients access to innovative, potentially life-enhancing cancer therapies



OUR SERVICES

SPECIALISED ONCOLOGY CARE

Division of Medical Oncology

- Highly-trained medical oncologists treat all types of cancer and cancer-related disorders
- Patients with complex cancer cases reviewed by **multidisciplinary tumour clinics** and **multidisciplinary tumour boards** to ensure the most appropriate and effective care is delivered

OUR SERVICES (CONTINUED)

ADVANCED ONCOLOGIC IMAGING

Division of Oncologic Imaging

- Equipped with **advanced imaging machines** to detect and monitor cancer, which is crucial to improving treatment outcomes

Department of Interventional Oncology

- Brings together specialists from interventional radiology and oncologic imaging, enabling surgeons to perform imaging-guided radiology procedures

RADIATION ONCOLOGY

Division of Radiation Oncology

- **Increased capacity and capabilities**, and offers **proton therapy**, a type of advanced radiation treatment that precisely targets and destroys cancer cells while minimising damage to surrounding healthy tissues
- Supported by a \$50 million gift from the Goh Foundation, the Goh Cheng Liang Proton Therapy Centre is the only such facility in the public healthcare sector

INTEGRATED SURGICAL CARE

Division of Surgery and Surgical Oncology

- **Offers full suite of surgical cancer services for every organ**
- Increased capacity for diagnostic and surgical procedures with three day-surgery operating theatres and two endoscopy suites

SUPPORTIVE AND PALLIATIVE CARE

Division of Supportive and Palliative Care

- Provides patients and their families with **holistic care and support at all stages of their cancer journey**
- Provides training for medical professionals and community partners in generalist palliative care skills so that patients near the end of life can be identified and given timely support

ONCOLOGY NURSING

- Nurses are **equipped with specialised skills** to better support patients with different cancers and their unique needs
- Nurses manage the administration of chemotherapy at the Ambulatory Treatment Unit

NATIONAL COMPOUNDING HUB

- The **national Good Manufacturing Practice (GMP) sterile compounding hub for cytotoxic drugs** features robotic arms for the preparation of intravenous chemotherapeutic drugs

PSYCHOSOCIAL ONCOLOGY

Department of Psychosocial Oncology

- Dedicated team of medical social workers, clinical psychologists and trained professionals who **support patients and their families throughout their cancer journey** through a range of services including counselling, art therapy and access to support groups



OUR SERVICES (CONTINUED)

GENETIC TESTING

Cancer Genetics Service

- Aims to **empower patients and their family members with the knowledge of cancer genetics** to take charge of their health
- Dedicated space available for genetic counselling and risk assessment delivered by a diverse team of trained clinical cancer geneticists and genetic counsellors

CANCER EDUCATION

Department of Cancer Education

- Trains healthcare professionals with the **latest skills and techniques in oncology care**
- Equips community healthcare providers with the knowledge and skills needed to deliver quality care

RESEARCH AND CLINICAL TRIALS

- With a focus on **advancing the understanding of cancer and developing innovative ways to improve patient outcomes**
- Increased lab space, cutting-edge research technology and on-site manufacturing facilities available for therapeutics
- Facilitates phase I to III clinical trials to address the region's greatest needs and improve patients' access to new and improved cancer therapies

For GP referrals, please contact NCCS at:
Tel: 6436 8288
Email: gpnetwork@nccs.com.sg

For other service enquiries, please call 6436 8000 or visit www.nccs.com.sg/about-us/contact-us/feedback.



Integrated, Patient-Centric Care for Sleep Disorders

The SingHealth Duke-NUS Sleep Centre

ABOUT THE CENTRE

The **SingHealth Duke-NUS Sleep Centre** is dedicated to establishing the best clinical and academic programmes in sleep medicine and sleep science. It aims to achieve optimal outcomes for patients with sleep disorders through integrated quality patient care, clinical education and research.

ADVANCEMENT THROUGH COLLABORATION

Towards its goal, the Centre brings together clinicians and researchers to educate, advance collaborative research, set new standards of clinical practice and impact healthcare policy at its six clinical sites:

- Singapore General Hospital
- Changi General Hospital
- Sengkang General Hospital
- KK Women's and Children's Hospital
- National Dental Centre Singapore
- National Neuroscience Institute

EDUCATION

The Centre works to further the development of sleep medicine in Singapore at different levels:

1. General public

Regular public outreach and sleep symposia to improve public awareness of various sleep disorders

2. Other medical professionals

Regular GP forums and sleep medicine courses to educate healthcare professionals on the impact of sleep disorders and the need for a high index of suspicion in looking out for comorbid sleep conditions

3. Specialist training

Sleep fellowship training programmes



Our Services

The Centre offers evaluation and treatment of all sleep disorders in adults and children including:

- Snoring and obstructive sleep apnoea
- Obesity hypoventilation syndrome
- Central apnoea
- Cheyne-Stokes breathing
- Complex sleep apnoea
- Overlap syndrome
- Insomnia
- Circadian rhythm sleep disorders
 - Jet lag
 - Advanced and delayed sleep phase syndromes
 - Shift work related sleep disorders
- Parasomnias
- Narcolepsy
- Rapid eye movement sleep behaviour disorder
- Periodic limb movements and restless leg syndrome

For GP referrals, please contact the SingHealth Duke-NUS Sleep Centre:

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Changi General Hospital
6788 3003

Sengkang General Hospital
6930 6000

KK Women's and Children's Hospital
6692 2984

National Dental Centre Singapore
6324 8798

National Neuroscience Institute
6330 6363

Website: www.singhealth.com.sg/sleepcentre



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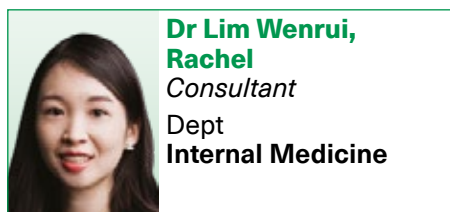
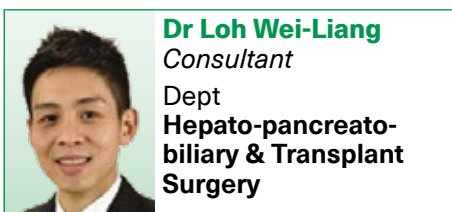
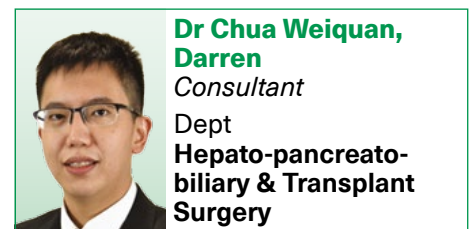
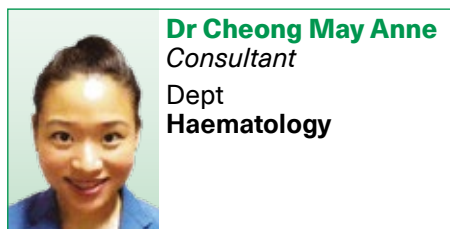
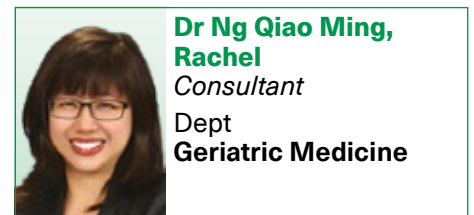
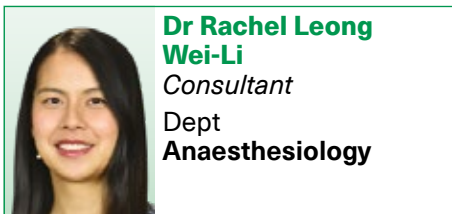
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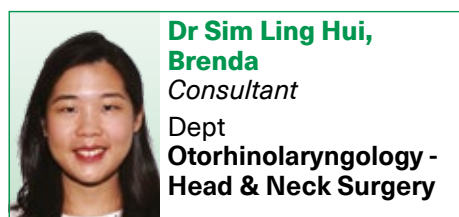
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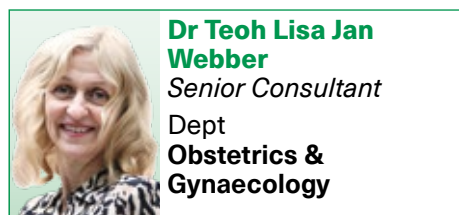
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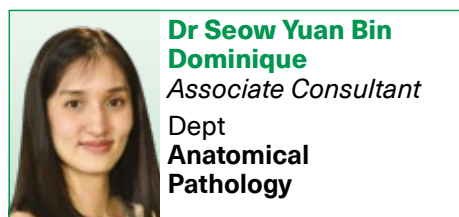
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Upper Gastrointestinal & Bariatric Surgery Service


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Consultant
Dept
Surgery



Dr Aw Kang Lie Darius
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Dept
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Appointed as Consultant



Dr Lin Ziwei
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Dr Neo Hui Shan Shirlyn
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Dr Shen Xiayan
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gpnetwork@sgh.com.sg
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Promoted to Senior Consultant



Dr Low Yin Yee Sharon
Head & Senior Consultant
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Dr Ker Rui Xin Justin
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- 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 email address together with a non-returnable photograph.

Please email your CV to the respective institutions' email addresses/online career portals with the Reference Number DM2307.



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

Singapore General Hospital

Departments seeking:

Resident Physicians and Staff Registrars

- Anaesthesiology
- Breast Surgery
- Colorectal Surgery
- Diagnostic Radiology
- Emergency Medicine
- ENT- Head & Neck Surgery
- Family Medicine & Continuing Care (FMCC)
- Gastroenterology & Hepatology
- General Surgery
- Haematology
- Hand & Reconstructive Microsurgery
- Infectious Diseases
- Orthopaedic Surgery (Sport & Exercise Medicine Centre)
- Plastic, Reconstructive & Aesthetic Surgery
- Rehabilitation Medicine
- Renal Medicine
- Rheumatology & Immunology
- SPRinT (Sarcoma, Peritoneal & Rare Tumours)
- Staff Clinic
- Vascular Surgery
- Urology

Associate Consultant/Consultant/

Senior Consultant

- Anatomical Pathology
- Occupational & Environmental Medicine
- SPRinT (Sarcoma, Peritoneal & Rare Tumours)
- Clinical Epidemiologist
- Microbiology (Diagnostic Bacteriology Section)

Website: www.sgh.com.sg

Career Portal: www.sgh.com.sg/careers

Email: careers.medical@sgh.com.sg

Changi General Hospital

Departments seeking:

Resident Physicians and Staff Registrars

- Accident & Emergency
- Anaesthesia & Surgical Intensive Care
- Breast Surgery
- Cardiology
- Dermatology
- Diagnostic Radiology
- Endocrinology
- Geriatric Medicine
- Medicine
- Neurosurgery
- Ophthalmology
- Orthopaedic Surgery
- Otorhinolaryngology - Head & Neck Surgery
- Psychological Medicine
- Rehabilitation Medicine
- Surgery
- Urology

Associate Consultants

- Anaesthesia & Surgical Intensive Care
- Cardiology
- Dermatology
- Diagnostic Radiology / Interventional Radiology
- Infectious Diseases
- Laboratory Medicine - Histopathology
- Orthopaedic Surgery
- Otorhinolaryngology - Head & Neck Surgery
- Rheumatology
- Surgery
- Urology

Dental Surgeon

- Oral & Maxillofacial

Website: www.cgh.com.sg

Email: medical_hr@cgh.com.sg

Sengkang General Hospital

Departments seeking:

Resident Physicians and Staff Registrars

- Anaesthesiology
- Breast Surgery Service
- Cardiology
- Emergency Medicine
- Surgery
- General Medicine
- Intensive Care Medicine
- Orthopaedic Surgery (with interest in Hand Surgery and Orthopaedic Surgery)
- Otorhinolaryngology - Head & Neck Surgery
- Plastic, Reconstructive & Aesthetic Surgery Service
- Psychiatry
- Radiology
- Urology
- Vascular Surgery Service

Senior Consultant, Consultant, Associate Consultant

- Emergency Medicine
- Otorhinolaryngology - Head & Neck Surgery
- Pathology
- Radiology

Website: www.skh.com.sg

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

Email: careers@skh.com.sg

KK Women's and Children's Hospital

Departments seeking:

Associate Consultants/Consultants/

Senior Consultants

- Pathology & Laboratory Medicine (Gynaecologic & Breast Pathologist, Microbiologist and Chemical Pathologist)
- Diagnostic & Interventional Imaging

Consultants

- Psychological Medicine
- Women's Anaesthesia

Staff Registrars

- Child Development
- Diagnostic & Interventional Imaging
- Neurology Service
- Paediatric Surgery

Family Physician

- Family Medicine

Resident Physicians

- Diagnostic & Interventional Imaging
- Emergency Medicine
- Obstetrics & Gynaecology
- Ophthalmology Service
- Orthopaedic Surgery
- Otolaryngology
- Paediatric Medicine
- Paediatric Surgery
- Psychological Medicine
- Women's Anaesthesia

Website: www.kkh.com.sg

Email: medical.hr@kkh.com.sg

National Dental Centre Singapore

Departments seeking:

- Consultant, Geriatric Special Dentistry Care
- Associate Consultant, Restorative Dentistry – Endodontics
- Dental Officer / Dental Surgeon, Geriatric Special Dentistry Care
- Dental Officer / Dental Surgeon, Restorative Dentistry

Website: www.ndcs.com.sg

Career Portal: www.ndcs.com.sg/careers/dentists

Email: chen.si.fan@ndcs.com.sg

National Heart Centre Singapore

Departments seeking:

Consultant (Electrophysiology & Pacing)

- Cardiology

Resident Physicians and Staff Registrars

- Cardiology
- Cardiothoracic Surgery

Website: www.nhcs.com.sg

Email: lim.bee.kuan@nhcs.com.sg
goh.bing.xue@nhcs.com.sg

National Neuroscience Institute

Departments seeking:

Resident Physicians and Service Registrars

- Neurology
- Neuroradiology
- Neurosurgery

Associate Consultant, Consultant, Senior Consultant

- Neurology
- Neuroradiology
- Neurosurgery

Website: www.nni.com.sg

Email: nni_hr@nni.com.sg

Singapore National Eye Centre

Departments seeking:

- Clinical Associate
- Resident Physician, Ophthalmology
- Staff Registrar, Ophthalmology

Senior Consultant, Consultant,

Associate Consultant

- Oculoplastic
- Ocular Inflammation and Immunology

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 Community Hospital)

Department seeking:

Staff Registrars, Resident Physicians

- Family Medicine

Website: www.singhealth.com.sg/sch

Career Portal: www.singhealth.com.sg/sch/careers

Email: schrecruitment@singhealthch.com.sg

CMEs & Courses



Singapore
General Hospital
SingHealth

SGH Lunchtime GP Q+A Sessions 2023

Meet our specialists as they address your questions on the latest updates in their specialty area, patient care and the referral process.

Date Wednesdays	Time 1pm to 2pm
Hosted via Zoom Webinar	Free admission

Date	Session 1 (1pm to 1.30pm)	Session 2 (1.30pm to 2pm)
16 Aug	Dept of Respiratory & Critical Care Medicine Dr Young Si Ling (Associate Consultant)	Dept of Vascular Surgery Dr Chng Siew Ping (Senior Consultant)
13 Sep	Dept of Urology Dr Lu Yadong (Associate Consultant)	Dept of Haematology Dr Esmeralda Teo Chi Yuan (Consultant)
11 Oct	Dept of Breast Surgery Dr Christina Yang Shi-Hui (Associate Consultant)	Dept of Psychiatry Assoc Prof Leslie Lim Eng Choon (Senior Consultant)
8 Nov	Dept of Hepato-pancreato-biliary and Transplant Surgery Dr Tan Hwee Leong (Associate Consultant)	Dept of Nuclear Medicine and Molecular Imaging Dr Tham Wei Ying (Consultant)



Scan the QR code to register.

For enquiries and to submit questions, please email to gpnetwork@sgh.com.sg.



HOTLINES



GP Fast Track Appointment Hotlines

Singapore General Hospital 6326 6060	KK Women's and Children's Hospital 6692 2984	National Heart Centre Singapore 6704 2222
Changi General Hospital 6788 3003	National Cancer Centre Singapore 6436 8288	National Neuroscience Institute 6330 6363
Sengkang General Hospital 6930 6000	National Dental Centre Singapore 6324 8798	Singapore National Eye Centre 6322 9399

www.singhealth.com.sg

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