A SingHealth Newsletter for General Practitioners | April 2021

SingHealth

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Lung Conditions

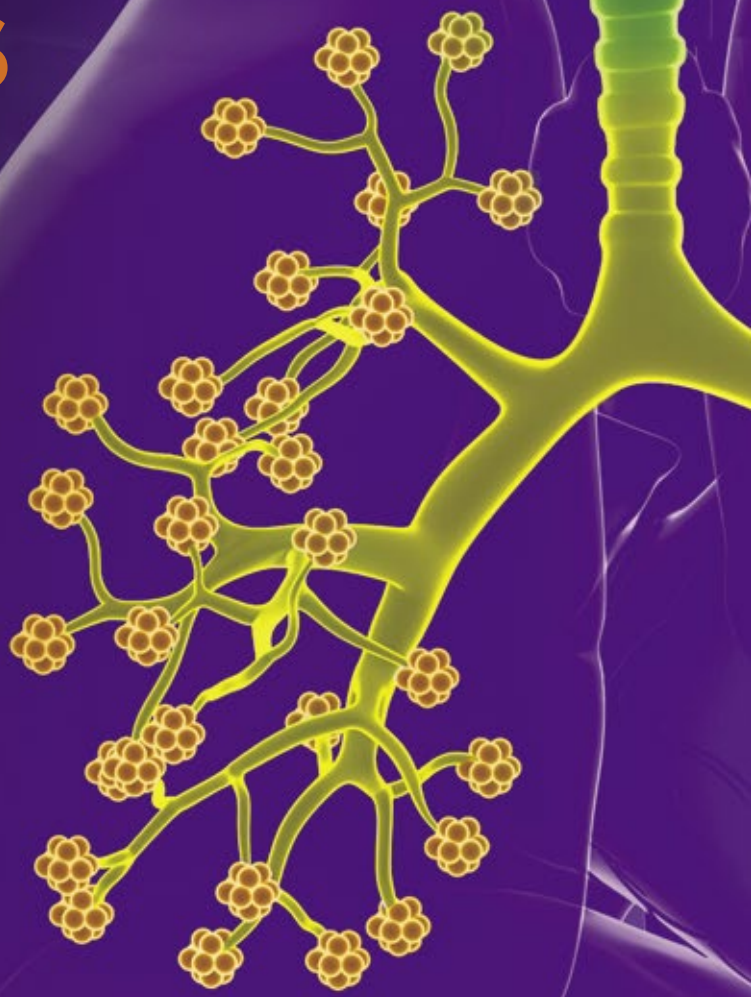
Managing COPD in Primary Care

Pulmonary Nodules: Evaluating Malignancy Risk

Optimising Primary Care for Asthma

PLUS

Managing Thyroid Nodules in the Primary Setting



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Contemporary Management of Chronic Obstructive Pulmonary Disease:

A Primary Care Perspective

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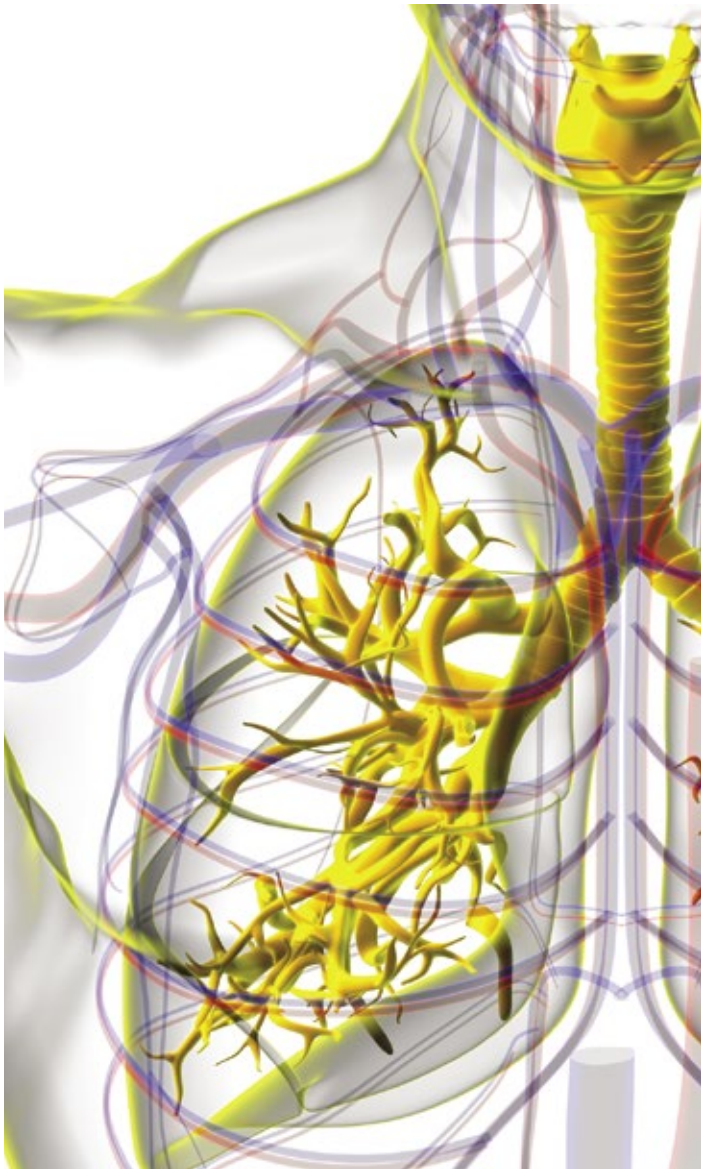
Primary care physicians are often the first line of care for chronic obstructive pulmonary disease. Through the assessment of symptoms and risk of future exacerbations, patients can be stratified to aid in selection of initial treatment. By individualising treatment and making timely referrals to specialists, general practitioners are able to effectively diagnose and manage this long-term condition.



INTRODUCTION

Chronic obstructive pulmonary disease (COPD) is a common, preventable and treatable disease characterised by persistent respiratory symptoms and airflow limitation, usually due to cigarette smoking.[1] The burden of COPD is staggering in Singapore, where it is the leading cause of respiratory disability and the tenth leading cause of death.[2]

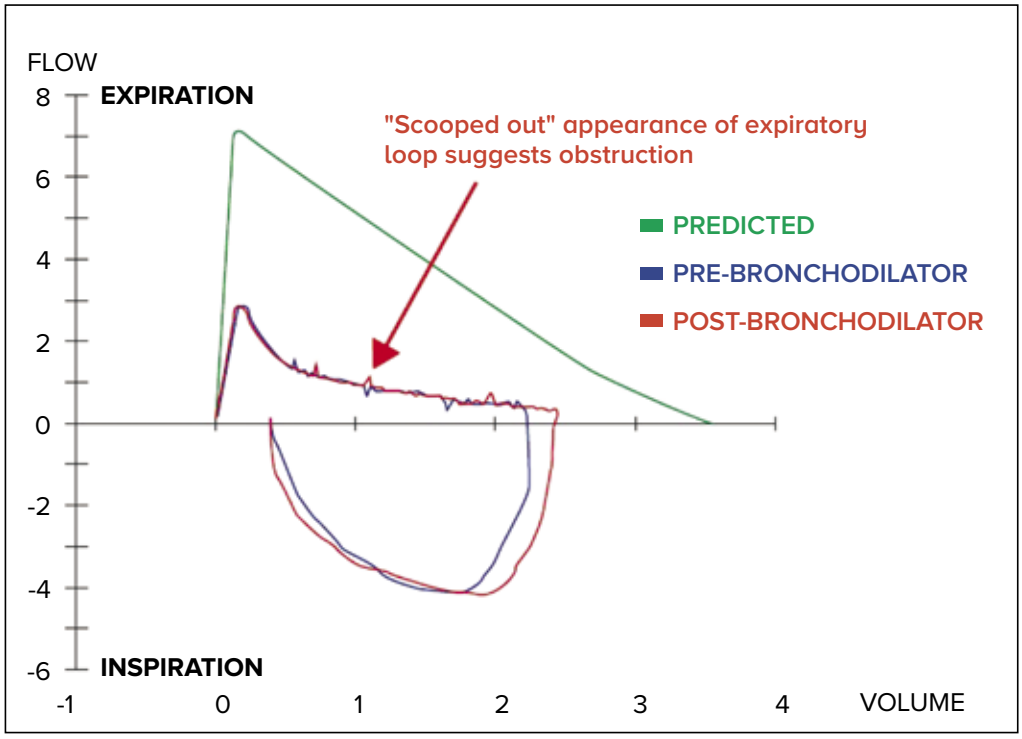
COPD is a common condition that may present to primary care health providers, who play an essential role in diagnosing and managing this long-term condition.

CASE VIGNETTE

A 75-year-old man presents with exertional dyspnoea which has been progressive over the past year. He has to stop to catch his breath when traversing the distance between two bus stops. Almost daily, he has cough productive of whitish or yellowish sputum but this is not bothersome for him.

He has attended primary care once in the past year for a respiratory tract infection which required treatment with antibiotics. He has a 30 pack-year smoking history and is still actively smoking.

Physical examination including vital signs is unremarkable. Chest x-ray is normal. Spirometry is shown in ***Figure 1***. The COPD Assessment Test (CAT) score is 15.



0.47 Post-bronchodilator $FEV_1/FVC < 0.7$ suggests persistent airflow limitation

45 Post-bronchodilator FEV_1 of 45% predicted corresponds to GOLD Grade 3

	Predicted	Pre-bronchodilator	%Predicted	Post-bronchodilator	%Predicted	%Change
FEV_1/FVC	0.73	0.54		0.47		
FEV_1	2.55 L	1.21 L	47	1.15 L	45	-5
FVC	3.51 L	2.24 L	64	2.45 L	70	9

Figure 1 Flow-volume loop with pre- and post-bronchodilator spirometry values

DIAGNOSING COPD

The patient described in the vignette is a smoker and demonstrates the chronic respiratory symptoms which are typical of COPD.

However, **history and physical examination alone are not sufficient** to make the diagnosis of COPD. Further investigations are needed to rule out other respiratory diseases that may present in a similar manner, as well as to confirm the diagnosis.

Chest x-ray is usually non-contributory in the diagnosis of COPD but is required to evaluate for other diseases such as congestive heart failure, tuberculosis, lung cancer and bronchiectasis. **The confirmation of COPD requires spirometry testing**. Specifically, the ratio of post-bronchodilator forced expiratory volume in one second (FEV_1) to forced vital capacity (FVC) should be less than 0.7.

The **Global Initiative for Chronic Obstructive Lung Disease GOLD Grade** (1 to 4) is based on the post-bronchodilator FEV_1 % predicted, with lower FEV_1 % predicted values indicating a higher or more advanced stage.

Whilst the GOLD grade predicts mortality and provides a useful gauge of the patient's current status in the long-term disease trajectory, **other patient-related outcomes** are usually assessed during a consult to guide selection of initial pharmacologic treatment.

GUIDE TO SELECTING INITIAL TREATMENT

The two core patient-related outcomes of symptoms or impact and risk of exacerbation should be assessed at each visit.

1. **Symptoms or impact**
   This can be assessed using either the **modified Medical Research Council (mMRC) dyspnoea scale** or the **COPD Assessment Test (CAT).**

   mMRC
   mMRC is a simple scale measuring dyspnoea when walking on level ground, ranging from 0 to 4 *(Table 1)*, with mMRC scores of 2 or above indicating a higher symptom burden.

   CAT
   The CAT score quantifies the symptomatic impact of COPD not only with respect to dyspnoea but also other domains such as cough, mucous, chest tightness, activities, sleep and energy. The CAT score ranges from 0 to 40 with higher scores indicating higher impact of symptoms. The patient presented in the clinical vignette had a CAT score of 15.

   For the purpose of selecting initial treatment, a CAT score of 10 or more indicates a higher symptom burden.

2. **Risk of exacerbation**
   Whilst many factors may lead to an exacerbation, the strongest predictor for a future exacerbation is **a history of previous exacerbation**. The patient described in the vignette had experienced one exacerbation-like event which was treated as a respiratory tract infection by his primary care provider.

PHARMACOLOGICAL MANAGEMENT

Based on symptoms and risk of future exacerbations, patients can be **stratified into different groups (ABCD)** for initial treatment *(Figure 2)*.

The patient in our vignette (one moderate exacerbation, CAT 15) falls under Group B, and may be commenced on a long-acting bronchodilator in the first instance, either a long-acting beta2-agonist (LABA) or long-acting muscarinic antagonist (LAMA).

Multiple inhaler devices are available for each class of medication, and the selection of inhaler device should be tailored to the individual patient to ensure that inhalers are used correctly. COPD outcomes are crucially dependent on delivering good basic care, and the adverse impact of inhaler misuse or nonadherence should not be underestimated.

Influenza and pneumococcal vaccinations are also recommended for COPD patients to reduce frequency and severity of infective exacerbations.

NON-PHARMACOLOGICAL MANAGEMENT

Non-pharmacological management of COPD is even more important than pharmacological management. Whilst pharmacological therapies have not been found to have an impact on mortality, some non-pharmacological interventions have a positive effect on survival in COPD, chiefly smoking cessation, which leads to slowing of the rate of lung function decline. Even a few minutes invested on smoking cessation counselling by physicians is associated with improved quit rates among smokers.

Grade	Description
0	Dyspnoea only with strenuous exercise
1	Dyspnoea when hurrying or walking up a slight hill
2	Walks slower than people of the same age because of dyspnoea or has to stop for breath when walking at own pace
3	Stops for breath after walking 100 yards (91 m) or after a few minutes
4	Too dyspnoeic to leave the house or breathless when dressing

Table 1 Modified Medical Research Council (mMRC) dyspnoea scale

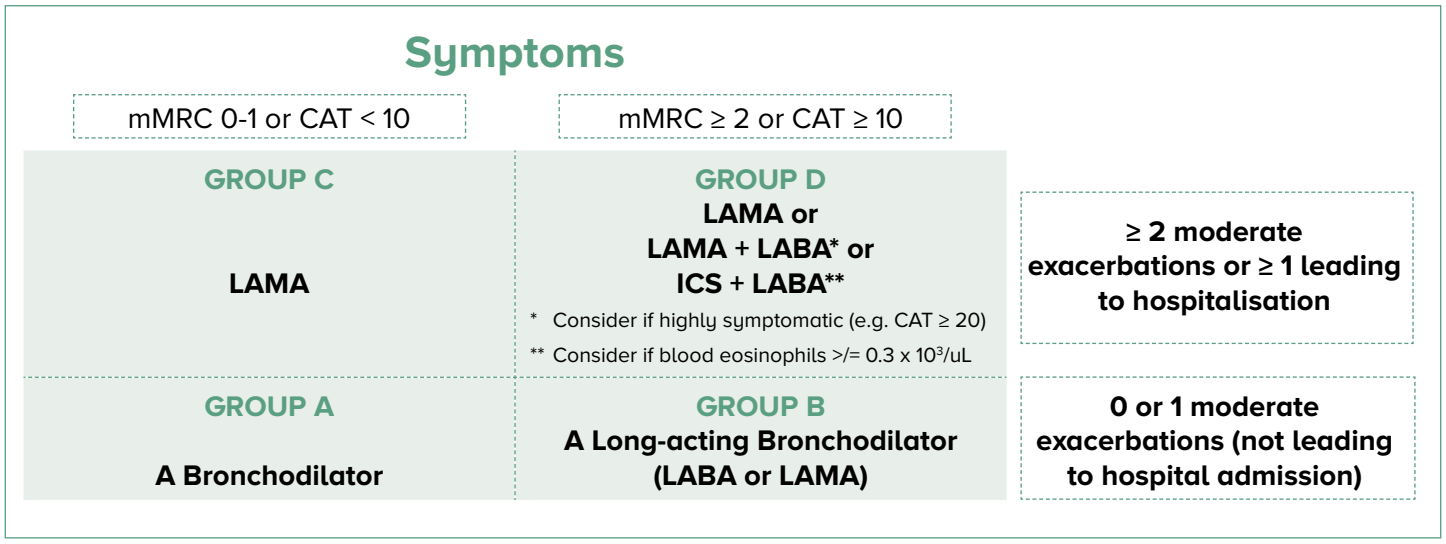


Figure 2 Classifying COPD patients into ABCD groups based on symptoms and risk of future exacerbations to aid in selecting initial treatment

LAMA: long-acting muscarinic antagonist; LABA: long-acting beta2-agonist; ICS: inhaled corticosteroids

WHEN REFERRAL IS NEEDED

Where clinically indicated, GPs should refer COPD patients for specialist advice. Referral is appropriate at all stages of the disease, not only for those who are most disabled by the disease.

Possible indications for GP referral include, but are not limited to:

- Diagnostic confirmation or uncertainty
- Frequent exacerbations
- Refractory symptoms
- A rapid decline in FEV_1

Specialists can perform assessments for interventions such as:

- Long-term oxygen therapy
- Long-term macrolides
- Lung volume reduction procedures
- Lung transplant
- Long-term nebuliser therapy
- Domiciliary non-invasive ventilation

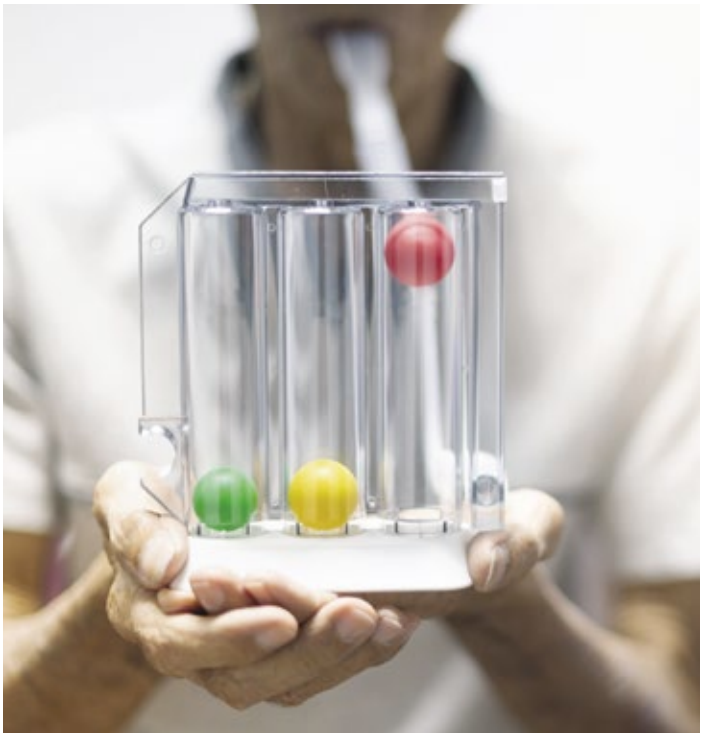
COPD patients may also benefit from a range of hospital-based services including case management, social work, pulmonary rehabilitation, occupational therapy, dietetics, community care, and palliative care.

Once stable, the care of COPD patients may be transferred back to primary care.

CONCLUSION

In conclusion, COPD is a condition commonly encountered in primary care. The diagnosis of COPD should be confirmed on spirometry as far as possible. Combined assessment of symptoms (using either the mMRC or CAT score) and risk of future exacerbations (based on history of previous exacerbations) is used to stratify patients for the purpose of selecting initial treatment.

Referral for specialist advice is appropriate at all stages of disease, not only for those who are most disabled by the disease.



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Apart from his clinical commitments, Dr Yii is active in pulmonology research with a focus on airway diseases and allergy and has been an invited reviewer for several international medical journals.

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

Singapore General Hospital
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Hotline: 6326 6060 SGH | 6692 2984 KKH
6788 3003 CGH | 6436 8288 NCCS
6930 6000 SKH

Pulmonary Nodules:
Evaluation of Malignancy Risk and Management Strategies

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Pulmonary nodules are often discovered incidentally. With the five-year survival rate for surgically resected early-stage lung cancer at about 75%, early identification of malignancy through careful clinical assessment of nodule size and malignancy risk is crucial to achieving better patient outcomes.

INTRODUCTION

A pulmonary nodule is defined as a small (≤ 30 mm), well-defined radiographic opacity surrounded by pulmonary parenchyma, without associated atelectasis, effusion or enlarged lymph nodes. It is a common radiologic finding, and a prevalence of 20-50% has been demonstrated in healthy adult volunteers and lung cancer screening populations.[1] Pulmonary nodules are often discovered incidentally, and the incidence is expected to rise with the increased utilisation of computed tomography (CT) scans.

ETIOLOGY

The differential diagnosis for pulmonary nodules is broad, and includes malignancy, inflammatory, infectious, congenital, and vascular pathologies. Most (> 95%) incidental pulmonary nodules are benign, even in lung cancer screening populations, but **some may be a sign of early lung cancer**.[2]

While the overall survival rate of lung cancer remains poor (10-15% five-year survival rate), in contrast, the five-year survival rate of surgically resected early-stage lung cancer approaches 75%.

It is therefore important for managing physicians to assess the likelihood of malignancy to guide evaluation and management.

RISK ASSESSMENT FOR MALIGNANCY

The **size** and **morphology** of the nodule are the two main determinants of cancer risk.[3]

Size

Nodules less than 6 mm in diameter have a low risk of cancer (< 1%), while approximately 40-80% of nodules larger than 20 mm are malignant.[3]

Morphology

Morphology refers to the **margins** (smooth, lobulated, or spiculated) and **attenuation** of the nodule.

Attenuation can be classified into solid or subsolid nodules, with the latter divided into pure ground glass and part-solid (having both ground glass and solid components) nodules. Ground glass nodules are characterised by an area of increased pulmonary attenuation that does not obscure underlying bronchial and vascular markings.

Subsolid or spiculated/lobulated nodules, upper lobe location as well as older age and heavy smoking also increase the risk of cancer.[1,4]

Quantitative assessment models have been developed to estimate the probability of malignancy, but these have not been validated in Asian populations.[5]

MANAGEMENT STRATEGY

When a nodule is identified, it is important to check previous imaging studies to evaluate if the nodule is new, old, stable, or growing over time. Solid nodules that are stable over time (≥ 2 years) are unlikely to be malignant.

Management of pulmonary nodules are largely determined by:[6]

1. Size of the nodule
2. Clinical probability of malignancy
3. Patient values and preferences

Not all incidental pulmonary nodules require routine follow-up or further evaluation. In a patient with a low risk profile and a solid nodule of < 6 mm, no follow-up may be necessary if this is consistent with the patient's preferences (after understanding the risks and benefits). For pulmonary nodules that require follow-up, surveillance with serial low-dose chest computed tomography scans (LDCT) is generally recommended for **nodules ≤ 8 mm in diameter**, or when the **clinical probability of malignancy is deemed to be low (< 5%)**.[6,7]

For indeterminate nodules **greater than 8 mm in size**, management options can vary, including:

- Surgical diagnosis
- Non-surgical biopsy (transthoracic or endoscopic lung biopsy)
- Functional imaging with fluorodeoxyglucose positron emission tomography (FDG-PET)
- Surveillance with serial CT scans

The management strategy will be largely guided by malignancy risk and individualised according to patient values and preferences.[6] For example, non-surgical biopsy, or surgical biopsy (and possibly simultaneous resection) in an individual with low surgical risk, is typically offered when the clinical probability of malignancy is deemed to be high (> 60%).

RADIOLOGICAL IMAGING

Chest CT with thin (≤ 1 mm) sections has a higher accuracy than chest radiographs in detecting nodules and can provide information on location, size, attenuation, and characteristics of the nodule. In an individual with an indeterminate nodule identified on chest radiography, a chest CT should be performed to help characterise the nodule.[4]

For surveillance imaging, contrast enhancement is typically not required, and a LDCT is sufficient.

IMPORTANT CONSIDERATIONS

There are important considerations with risk assessment and management in the local population.

Firstly, pulmonary tuberculosis is a common disease presenting as pulmonary nodule(s) in the local and Asian population. Like cancer, tuberculosis is more commonly found in the upper lobes and can result in a positive PET scan, which makes interpretation challenging.

Secondly, Asian women who are never-smokers are at higher risk of developing lung cancer compared with women living in Western countries. Adapting risk assessment and management of patients with the above considerations in mind is recommended in our local population.[6]

REFERRAL TO A SPECIALIST CENTRE

An optional LDCT at 12 months may be performed for individuals with solid nodules < 6 mm, which should be guided by clinical assessment of malignancy risk and patient preferences.[7] However, individuals with solid nodule(s) ≥ 6 mm or subsolid nodule(s) of any size should be referred to a specialist centre for management.

A WORD ON LUNG CANCER SCREENING

Organisations like the United States Preventive Services Task Force recommend annual lung cancer screening with LDCT for eligible individuals. This is largely driven by the results of large multicentre trials from North America and Europe reporting a reduction in lung cancer-related mortality with LDCT screening.[8,9]

Screening in Asian population

However, strong evidence supporting lung cancer screening for the Asian population is still lacking, with concerns of overdiagnosis and false positives leading to unnecessary investigations (e.g., lung biopsy) with risk of complications. The ideal screening population is also unclear as a significantly higher proportion of lung cancers are detected among never-smokers in the Asian population, compared to Western countries.

Clinical practice guidelines (2010) from the Ministry of Health Singapore recommend against routine screening for lung cancer.[10]

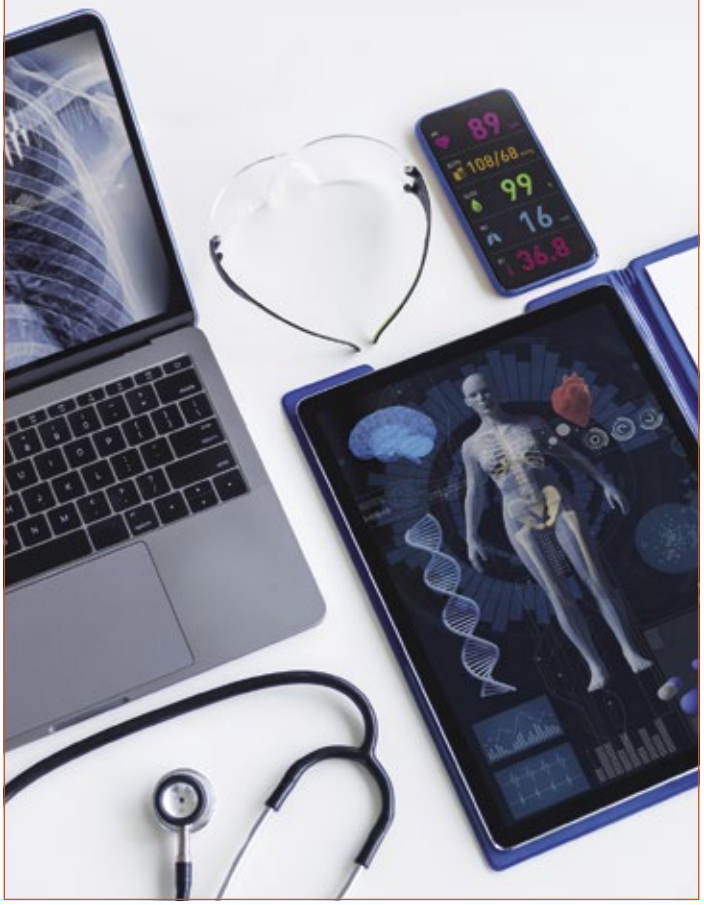
Who should be screened

For asymptomatic individuals between 55-74 years of age and a smoking history ≥ 30 pack-years (current smoker or ex-smoker who quit smoking within the last 15 years), it may be reasonable to engage in opportunistic discussion on lung cancer screening.[11] Certainly, all patients who are current smokers should be routinely counselled on smoking cessation.

SINGHEALTH DUKE-NUS LUNG CENTRE

The SingHealth Duke-NUS Lung Centre is focused on delivering high quality clinical care for all thoracic conditions and provides a unique platform for multidisciplinary collaboration and consultation.

Within the Centre is a dedicated **Nodule Clinic**, which offers access to multidisciplinary services (by Respiratory Medicine Physicians, Surgeons, Radiologists, Oncologists and Thoracic Nurse Practitioners) as recommended in guidelines.[6]



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Optimising Primary Care for Patients with Asthma in 2021

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Although Singaporeans have access to one of the most advanced healthcare in the world, preventable asthma deaths still continue to occur today because of excessive patient reliance on short-acting beta-agonists. Many of these patients can be managed effectively, however, in the primary setting with interventions such as appropriate emergency treatment to treat asthma exacerbations and trigger points, as well as the optimisation of long-term management with regular review.

INTRODUCTION

Asthma is a chronic condition with variable respiratory symptoms such as wheeze, breathlessness, chest tightness and cough characterised by chronic airway inflammation. It is one of the most frequently encountered chronic diseases in primary care clinics affecting around 5% of Singapore residents aged 18-69 years.[1]

Undertreatment of asthma, even in relatively asymptomatic patients, can lead to severe exacerbations resulting in hospitalisation or mortality. Such events, however, are preventable and the goals of good symptom control and reduction of exacerbation risk can be achieved in most patients with quality and holistic asthma care.

ASTHMA MORTALITY AND MORBIDITY REMAINS HIGH IN SINGAPORE TODAY

Despite the advances in asthma treatment over the past decade, Singapore's asthma mortality and hospitalisation rates have continued to stagnate at levels that remain two to three times higher than other developed countries such as the United States and Japan.

In a survey of eight Asia-Pacific countries, one in two asthmatics in Singapore reported missing school or work while one in three asthmatics reported having an exacerbation in the preceding year.[2] In the same study, it was also found that Singapore ranked lowest in the usage of preventer medications with only one in four asthmatics reporting usage in the previous month.

Although there have been advancements in the accessibility to healthcare and treatment options for asthma in Singapore, **significant quality gaps in asthma care remain that contribute towards asthma mortality and morbidity**. An audit of 340 patients hospitalised for fatal and near-fatal asthma in four restructured hospitals in Singapore from 2011-2015 was performed, and it found that 17.1% had no regular asthma follow-up and 32.1% were not on any inhaled corticosteroids (ICS).[3]

It is imperative that we close these gaps in quality if we are to achieve further reductions in mortality and morbidity.

CLINICAL VIGNETTE

Mr C, a 30-year-old man, presents to your clinic with shortness of breath and chest tightness for a 3-day duration. He is an active smoker and has a history of asthma since childhood.

He relies on his salbutamol inhaler for symptom relief up to four times daily, even though he was previously prescribed an ICS inhaler. He only sees his general practitioner (GP) three to four times a year for nebulisations and when he is unable to relieve his symptoms with his salbutamol inhaler.

Many GPs have encountered patients like Mr C who only seek episodic and unscheduled emergency care for asthma. How can we improve the quality of their asthma care in Singapore?

WHAT INTERVENTIONS CAN IMPROVE THE QUALITY OF MR C'S ASTHMA CARE?

1. **Effective emergency medical treatment of asthma exacerbations, addressing trigger factors, and initiation of appropriate long-term management with early outpatient medical review**

Oral corticosteroids

Patients who present for acute asthma exacerbations like Mr C should be treated with **a 5-7 day course of oral corticosteroids (OCS)** such as prednisolone (30–40 mg/day) within one hour of presentation, to speed up resolution of exacerbations and prevent relapse.

ICS-containing preventer

It is also recommended that patients be initiated on an **ICS-containing preventer**, if not previously prescribed. If the patient is already receiving an ICS-containing preventer, they should have their preventer treatment stepped up for 2-4 weeks. Inhaler technique should be demonstrated and checked.

Written asthma action plan

All patients should also be issued a **written asthma action plan (WAAP).** The WAAP should include details of the patient's usual asthma medications, instructions on how to recognise worsening asthma and the necessary actions to take, which range from increasing the ICS dose or using OCS to seeking emergency help in addition to reliever use.[4] Possible reasons for the exacerbations and appropriate advice should be given, such as smoking cessation and avoidance of common triggers (exposure to allergens, irritants, pollution, drugs, etc.).

Early outpatient medical review

Finally, an **outpatient follow-up appointment within 1-2 weeks** should be issued to their usual healthcare provider to review the patient's symptoms and ensure that asthma treatment is continued.[4]

2. **Optimising long-term management of asthma with ICS and regular medical review**

Benefits of ICS over short-acting beta-agonist treatment

ICS reduces airway inflammation and is the most effective management option for asthma. It significantly reduces the risk of asthma exacerbation and mortality with benefits derived at low doses even in patients with infrequent asthma symptoms. ICS also improves lung function, asthma symptoms and control, and reduces missed days at work or school as well as healthcare costs.[4,5]

Although short-acting beta-agonist (SABA) treatment is effective for quick relief of asthma symptoms, it does not address the underlying pathology of chronic airway inflammation. In fact, overuse of SABA is associated with increased risk of death and exacerbation.

Based on evidence from clinical trials and real world data, Singapore's Ministry of Health Agency for Care Effectiveness (ACE) Clinical Guidance for Asthma (2020) recommended **ICS as the mainstay of long-term asthma treatment** for step 1 (for all ages) ***(Figure 1)***.

The use of SABA alone (without a preventer) is no longer recommended for the long-term treatment of patients aged 6 years and older, even those

The decision regarding choice or adjustment of preventer treatment is mainly guided by asthma symptoms, risk of poor asthma outcomes, and presence of BREATHE factors.

Age	Treatment Category	Step 1 / Step 2	Step 3	Step 4 (consider specialist referral)	Step 5 (refer to a specialist)
≥ 12 years	**Preventer options**	**Daily** • **Low-dose ICS** • LTRA[a] **As-needed** • Low-dose ICS-formoterol[b] • Low-dose ICS whenever SABA inhaler is used[c]	**Daily** • **Low-dose ICS-LABA** • Low-dose ICS + LTRA[a] • Medium-dose ICS **MART** • **Daily low-dose ICS-formoterol[d] + as-needed low-dose ICS-formoterol[d]**	**Daily** • **Medium-dose ICS-LABA** • Medium-dose ICS + LTRA[a] • High-dose ICS *Possible adjustments to daily preventer options above:* • Add LTRA[a] to medium-dose ICS-LABA or high-dose ICS • Increase to high-dose ICS-LABA or high-dose ICS + LTRA[a] • Add tiotropium **MART** • **Daily medium-dose ICS-formoterol[d] + as-needed low-dose ICS-formoterol[d]** *Possible adjustments to MART preventer above:* • Add LTRA[a] to daily medium-dose ICS-formoterol[d] • Add tiotropium to daily medium-dose ICS-formoterol[d]	Continue treatment as per Step 4 and consider add-on treatment with asthma biologic agents[e], or low-dose OCS
	Reliever	**SABA inhaler (not needed when using as-needed ICS-formoterol[b] or MART). Do not use SABA monotherapy for asthma.**			
6–11 years	**Preventer options**	**Daily** • **Low-dose ICS** • LTRA[a] **As-needed** • Low-dose ICS whenever SABA inhaler is used[c]	**Daily** • **Low-dose ICS-LABA** • Low-dose ICS + LTRA[a] • Medium-dose ICS **MART** • Daily low-dose ICS-formoterol[f] + as-needed low-dose ICS-formoterol[f]	**Daily** • **Medium-dose ICS-LABA** • Medium-dose ICS + LTRA[a] *Possible adjustments to daily preventer options above:* • Add LTRA[a] to medium-dose ICS-LABA • Increase to high-dose ICS-LABA or high-dose ICS + LTRA[a] • Add tiotropium	Continue treatment as per Step 4 and consider add-on treatment with asthma biologic agents[e], or low-dose OCS
	Reliever	**SABA inhaler (not needed when using MART). Do not use SABA monotherapy for asthma.**			

Figure 1 Stepwise approach to pharmacological treatment for Asthma[4]

CLINICAL VIGNETTE (Cont'd)

with infrequent or minor symptoms.[4] This was also reflected in the Global Initiative for Asthma (GINA) strategy report which was revised significantly in 2019 to recommend the prescription of (1) as-needed budesonide-formoterol or (2) as-needed ICS whenever SABA is taken, for step 1 treatment instead of SABA PRN.[5]

Regular medical review

After initiation of ICS-containing preventer medications, patients like Mr C should be **regularly reviewed at least twice yearly** to assess their asthma control with validated questionnaires such as the Asthma Control Questionnaire (ACQ), the Asthma Control Test (ACT) or other validated questionnaires.[4]

A patient with well-controlled asthma should have no symptoms and no exacerbations. Consideration should be given towards treatment escalation in stepwise fashion ***(Figure 1)*** if patients continue to have frequent or intensive symptoms, especially if risk factors for severe asthma outcomes are present ***(Figure 2)***.

3. Timely referral to a respiratory specialist for difficult-to-treat asthma

Although most patients with asthma can be managed effectively in primary care, GPs should consider specialist referral if:

- The diagnosis of asthma is uncertain, for further diagnostic evaluation with lung function tests like spirometry and bronchial provocation testing,
- Patients continue to have persistent or worsening symptoms despite stepping up of preventer treatment,
- Patients require medium-to-high doses of ICS-containing treatment or long-term oral corticosteroid therapy (patients on step 4 or 5 treatment), for consideration of biologic therapy;
- Or for specific subgroups of patients with asthma such as pregnant patients, patients with occupational asthma, elderly patients, or athletes.

Risk factors for severe asthma exacerbations or mortality

1. SABA monotherapy or usage of ≥ 1 canister of salbutamol in ≤ 2 months
2. Suboptimal ICS use
3. History of intubation or admission to ICU for asthma
4. History of one or more exacerbations in the past year
5. Cigarette smoking (past or present)

Figure 2 Risk factors for severe asthma exacerbations or mortality

In summary, Mr C's asthma care can be optimised by:

1. Treating his current asthma exacerbation with a course of prednisolone 30 mg daily for 5 days and addressing possible trigger factors
2. Initiating an ICS-containing long-term treatment for him
3. Giving him an outpatient appointment in 1-2 weeks to review his response to treatment for exacerbation, and regular follow-up for asthma at least twice yearly thereafter
4. Providing asthma education, inhaler technique training and issuing a personalised WAAP to optimise self-management
5. Advising him to quit smoking and receive vaccinations for influenza and pneumococcal disease as per the National Adult Immunisation Schedule in Singapore
6. Considering him for specialist referral if his asthma symptoms remain uncontrolled or he continues to have exacerbations

THE SGH SEVERE/DIFFICULT-TO-TREAT ASTHMA CLINIC

The SGH Severe/Difficult-to-Treat Asthma Clinic was set up in 2011 and provides highly specialised care for patients with difficult-to-treat or severe asthma. It comprises of a multidisciplinary team of respiratory specialists, asthma nurses, pharmacists and physiotherapists with the goal of helping asthma patients achieve optimal asthma control.

We offer specialised tests to aid in diagnosis and phenotyping of asthma (e.g., induced sputum). Advanced treatments such as biologics (anti-IgE, anti-IL5/IL5R) as well as bronchial thermoplasty are also available. In addition, patients also have options to participate in clinical trials and research.

HOW GPS CAN REFER

To refer a patient to the SGH Severe/Difficult-to-Treat Asthma Clinic, GPs can contact the Clinic at:

Tel: 6326 5361
Email: rccmappointment@sgh.com.sg

For more information on the Clinic, scan the QR code to visit the website.

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Dr Chew Si Yuan is an Associate Consultant in the Department of Respiratory & Critical Care Medicine, Singapore General Hospital. He graduated from the National University of Singapore and completed his Respiratory Medicine and Intensive Care Medicine training in Singapore. He has a keen interest in medical education and is active in teaching medical undergraduates and residents from both internal medicine and family medicine.

GPs who would like more information about this service, please contact Dr Chew at chew.si.yuan@singhealth.com.sg.

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

Singapore General Hospital	Changi General Hospital	Sengkang General Hospital
6326 6060	**6788 3003**	**6930 6000**

National Cancer Centre Singapore	KK Women's and Children's Hospital
6436 8288	**6692 2984**

Singapore General Hospital
SingHealth

How to Manage Thyroid Nodules in Primary Care:
A Case Vignette

Dr Kimberley Kiong
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Singapore General Hospital

GPs are often the first line of diagnosis for thyroid nodules. While most nodules are benign, when is further investigation needed? Through an in-depth case vignette, we share insights on what to look out for, how to investigate and manage, and when to refer.

INITIAL PRESENTATION AND EXAMINATION

A 40-year-old lady with no past medical history presents with a two-week history of a right anterior neck lump. The mass has not increased in size and she has no other symptoms such as hoarseness or dysphagia.

What else would you do?

- **History taking for risk factors for thyroid cancer**
  - Family history
  - Exposure to radiation
- **Check for symptoms of hyperthyroidism/hypothyroidism**
- **Examination**
  - Thyroid masses
  - Cervical lymphadenopathy
- **Check for red flags for thyroid cancer**
  - Rapid growth
  - Persistent hoarseness suggesting recurrent laryngeal nerve involvement
  - Dysphagia
  - Hard/fixed mass
  - Cervical lymphadenopathy

On further questioning, she notes that her mother had a history of thyroid cancer with surgery performed many years ago. She is clinically euthyroid. On examination, a 2 cm right thyroid nodule is palpated. This appears well circumscribed, firm and moves with swallowing. There is no cervical lymphadenopathy. She is very anxious about this nodule and asks if she has cancer.

What can you tell her?

- Thyroid nodules are **very common** and can occur in up to 60% of the population. This condition is more common in women.
- **Majority (> 95%) of thyroid nodules are benign,** while the remaining 5% are malignant[1]
- She does have a **family history of thyroid cancer** and **would benefit from further workup of this nodule** (5-10% of differentiated thyroid cancers have a familial occurrence[1])
- However, given that only one first-degree family member is affected, she would not have benefitted from thyroid cancer screening with ultrasounds[1]

INVESTIGATIONS

She agrees to further workup. What investigations should be performed?

You can perform:

1. **Thyroid panel (thyroxine [T4] / thyroid-stimulating hormone [TSH])**
   It is recommended by the American Thyroid Association (ATA) that serum TSH be measured in the initial evaluation of a patient with a thyroid nodule. This is also relevant if the patient is subsequently planned for surgery as general anaesthesia can precipitate a thyroid storm in patients with uncontrolled hyperthyroidism.

2. **Thyroid/neck ultrasound with survey of the cervical lymph nodes**
   It is preferable to have an experienced and accredited provider perform a formal diagnostic ultrasound of the neck as the pattern of sonographic features **confers a risk of malignancy**, and combined with nodule sizes, **guides decision for fine needle aspiration (FNA).**

Numerous systems provide guidelines on risk levels and decision making for FNA, including the ATA guidelines ***(Figure 1)*** as well as the American College of Radiologists Thyroid Imaging Reporting and Data System (ACR TI-RADS).

In Singapore General Hospital (SGH) and throughout SingHealth Polyclinics, the **ACR TI-RADS system**[2] is employed for all thyroid ultrasound reports. Each ultrasound characteristic is given a value and the total number is then tallied to achieve a final score (ranging from TR 1-5). Based on this score, recommendations are given for FNA or follow-up.

SONOGRAPHIC PATTERNS, ESTIMATED RISK OF MALIGNANCY, AND FINE-NEEDLE ASPIRATION GUIDANCE FOR THYROID NODULES

Sonographic pattern	*US features*	*Estimated risk malignancy, %*	*FNA size cutoff (largest dimension)*
High suspicion	Solid hypoechoic nodule or solid hypoechoic component of a partially cystic nodule ***with*** one or more of the following features: irregular margins (infiltrative, microlobulated), microcalcifications, taller than wide shape, rim calcifications with small extrusive soft tissue component, evidence of ETE	> 70-90[a]	Recommend FNA at ≥ 1 cm
Intermediate suspicion	Hypoechoic solid nodule with smooth margins ***without*** microcalcifications, ETE, or taller than wide shape	10-20	Recommend FNA at ≥ 1 cm
Low suspicion	Isoechoic or hyperechoic solid nodule, or partially cystic nodule with eccentric solid areas, ***without*** microcalcification, irregular margin or ETE, or taller than wide shape	5-10	Recommend FNA at ≥ 1.5 cm
Very low suspicion	Spongiform or partially cystic nodules ***without*** any of the sonographic features described in low, intermediate, or high suspicion patterns	< 3	Consider FNA at ≥ 2 cm Observation without FNA is also a reasonable option
Benign	Purely cystic nodules (no solid component)	< 1	No biopsy[b]

US-guided FNA is recommended for cervical lymph nodes that are sonographically suspicious for thyroid cancer.
[a]The estimate is derived from high volume centers, the overall risk of malignancy may be lower given the interobserver variability in sonography.
[b]Aspiration of the cyst may be considered for symptomatic or cosmetic drainage.
ETE, extrathyroidal extension.

Figure 1 American Thyroid Association guidelines for thyroid nodule biopsy

WHEN TO REFER FOR SPECIALIST CARE

You decide to perform the thyroid panel and neck ultrasound and the results return as:

- T4/TSH normal
- The ultrasound shows a 1.5 cm hypoechoic right lower pole nodule with irregular margins and possible microcalcifications

Based on these suspicious results, you refer her to the **SGH Otorhinolaryngology - Head & Neck Surgery specialist outpatient clinic**.

What are other possible reasons for referral?

- Red flag symptoms/signs of thyroid cancer (e.g., rapid growth, persistent hoarseness suggesting recurrent laryngeal nerve involvement, dysphagia, shortness of breath/stridor, hard/fixed mass, cervical lymphadenopathy)
- Large nodule (> 4 cm), with/without compressive symptoms
- Large multinodular goiter, with/without compressive symptoms
- Nodules that have been observed with serial ultrasounds but show a significant increase in size (> 20% increase in at least two dimensions)

What patients can you manage without referral at this point?

- Purely cystic nodules without symptoms: risk of malignancy < 1%. These nodules can also be aspirated if you are comfortable with such procedures, although aspiration carries the risk of bleeding, infection, re-accumulation and rarely airway compromise
- Very low suspicious nodules (e.g., spongiform nodules), which can be followed with serial ultrasound (e.g., yearly)
- Nodules that have previously been investigated and have either two benign FNAs before or stable nodules with a previous benign FNA

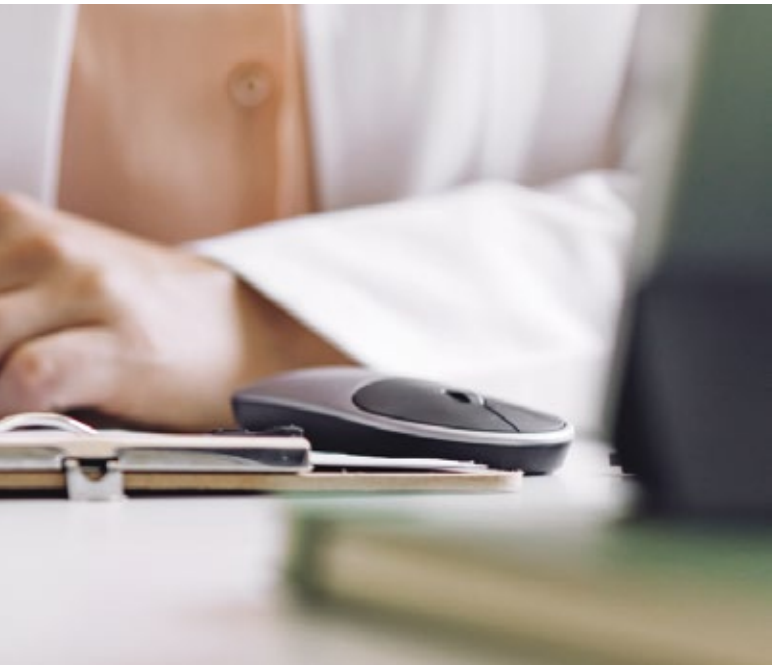
WHAT TREATMENTS ARE AVAILABLE

The patient is seen in the SGH Otorhinolaryngology - Head & Neck Surgery specialist outpatient clinic and ultrasound guided FNA is performed. The results return as suspicious for papillary thyroid cancer and she is offered a hemithyroidectomy versus a total thyroidectomy.

What are the pros and cons of hemithyroidectomy versus total thyroidectomy?

Hemithyroidectomy
In tumours less than 4 cm, hemithyroidectomy has been found to have **excellent survival** in properly selected low- to intermediate-risk (with no extrathyroidal extension or lymph node metastases) patients. While there is a **slightly higher risk of recurrence** with hemithyroidectomies, salvage therapy is highly effective.

Total thyroidectomy
Total thyroidectomy carries **increased risk of recurrent laryngeal nerve palsy and bilateral recurrent laryngeal nerve palsy** (which may require a tracheostomy). Also, there is a **risk of hypocalcaemia** and there is a need for lifelong thyroxine replacement (as opposed to no risk of hypocalcaemia and 25% risk of requiring thyroxine supplementation for hemithyroidectomies).



The patient decides on a total thyroidectomy and enquires about minimally invasive options that she has found while doing an online search.

What can you tell her about this?

- Thyroidectomies (hemi and total) are **mostly performed via a neck or transcervical skin incision.** This affords the best access and visualisation of the thyroid gland and its surrounding structures such as the recurrent laryngeal nerves and parathyroid glands, but leaves a visible neck scar.

- **For small thyroid lesions,** a shortened neck incision may be adopted to remove the lesion via a video-assisted technique known as MIVAT (minimally-invasive video-assisted thyroidectomy). This method is, however, not suitable for all patients.

- **Remote access approaches** have been developed to avoid a neck scar. It is important to understand that fundamentally, these options do not offer an equivalent ease of access and they require a larger extent of dissection and longer operative time. These approaches site the scar away from the neck, and common locations include: post-auricular, axillary, anterior chest-wall/ breast-axillary, and transoral. A combination of endoscopic and/or robotic instruments are usually required to perform the surgery.

  These approaches are available at SGH but **meticulous patient selection and careful risk-benefit consideration must be undertaken before embarking on surgery**[3].

POSTOPERATIVE CARE AFTER DISCHARGE

The patient undergoes a total thyroidectomy uneventfully. Postoperatively her calcium levels are normal and parathyroid hormone level is at the lower range of normal. By postoperative day (POD) three, her calcium levels are noted to be stable and she is discharged home with a surgical drain, with advice on how to care for the drain.

Scenario 1:
She presents to your clinic the day after discharge and her drain bottle has lost suction. What can you do?

- **Assess the drainage amount**
  Each patient has been given a chart to record the drain amounts per 24 hours. This value is usually less than 50 ml / 24 hours by POD 3 and there should be a downtrend. The drainage should be serous or mildly haemoserous.

- **Assess for neck swelling**
  If there is no neck swelling, the drain suction can be re-created or drain bottle changed (each patient is usually provided with a new drain bottle).

  The patient should be sent to Accident & Emergency (A&E) if there is significant neck swelling, neck erythema/tenderness, purulent drainage, or shortness of breath.

Scenario 2:
She presents to your clinic the day after discharge complaining of perioral numbness and tingling in her hands and feet. What should you do?

- These are symptoms of **hypocalcaemia**

- Chvostek's sign (tapping over the parotid elicits twitching in the facial nerve) can be elicited but a negative sign is not sensitive and does not rule out hypocalcaemia

- The patient can be given a stat dose of 2.5 g calcium carbonate and 0.5 mcg Rocaltrol and an electrocardiogram (ECG) can be performed

- Unless able to send and check for calcium levels stat, the patient should be referred back to A&E for calcium level check and possible intravenous (IV) calcium replacement

FOLLOW-UP AND MONITORING

Histology results return as a 1.5 cm papillary thyroid carcinoma with no lymph node involvement. She is thus staged as a T1N0 papillary thyroid carcinoma and she is maintained on 100 mcg thyroxine.

How do we follow her up?

- **Clinical follow-up and neck examination** every 6-12 monthly.
- **Thyroxine supplementation is used to maintain the TSH at a suppressed level,** to reduce the risk of recurrence. The exact TSH target is dependent on factors including:
  - Risk of recurrence
  - Symptoms of hyperthyroidism
  - Age
  - Risk factors for hyperthyroidism (e.g., atrial fibrillation [AF])

  This may range from < 0.1 in high-risk patients to 0.5-2.0 mU/L in low-risk patients.
- **Thyroglobulin (Tg) and thyroglobulin antibody (TgAb) levels**. These are markers of differentiated thyroid cancer recurrence that are generally more useful only if a total thyroidectomy has been performed. These have more value when trended serially (i.e., an uprising trend suggests recurrent disease).
- **Neck ultrasound.** A scan may be performed 6-12 months from surgery to assess for any structural disease. Scans may also be ordered if there is clinical suspicion of disease (e.g., new neck mass or if there is an increase in Tg levels).

She remains well for 5 years with persistently low Tg levels and no evidence of disease on neck ultrasound. She is keen for discharge from the specialist clinic to be followed up under your care.

How can you monitor her?

- In low-risk patients that have an excellent response to therapy, the utility of subsequent Tg testing is not established. The time interval can be lengthened to at least 12-24 months.[1]
- Serum TSH should be measured at least every 12 months in all patients on thyroid replacement therapy, with the TSH goal 0.5-2.0 mU/L.
- On follow-up, neck examination should be performed to detect any masses.
- Patients should be referred back to specialist care if new head and neck symptoms develop, a neck mass is detected, or there is a rise in Tg.

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Dr Kimberley Kiong is a Consultant at the Singapore General Hospital Department of Otorhinolaryngology - Head & Neck Surgery, and the Sengkang General Hospital Department of Otolaryngology (ENT). She is also Consultant with the SingHealth Duke-NUS Head & Neck Centre, seeing general ear, nose and throat (ENT) cases as well as thyroid and head and neck tumours.

Dr Kiong completed her medical degree at the National University of Singapore, Yong Loo Lin School of Medicine in 2011 and finished her ENT specialist training under the SingHealth Residency Program in 2017. During this time, she has published several papers and received the Outstanding Resident Award on multiple occasions.

Dr Kiong has completed a prestigious advanced fellowship training at the MD Anderson Cancer Center in Houston, USA, and is currently specialised in Head and Neck Cancer Surgery. Her specific interests include endoscopic skull base surgery for tumours and transoral robotic surgery.

Dr Anna See
Consultant, SingHealth Duke-NUS Head & Neck Centre;
Department of Otorhinolaryngology - Head & Neck Surgery,
Singapore General Hospital

Dr Anna See graduated from the National University of Singapore (NUS), Yong Loo Lin School of Medicine in 2012. She completed her membership examination of the Royal College of Surgeons of Edinburgh (Surgery) in 2014, and obtained her Master of Medicine (ENT) from NUS in 2015. She became a certified ENT specialist in 2018 upon completion of her ENT residency training in Singapore.

Her main interests are in the treatment of head and neck cancers and thyroid lesions. Her practice also covers general adult ENT conditions. Apart from clinical medicine, she has a keen interest in research of head and neck cancers and has presented in various regional and international conferences.

GP Appointment Hotline: **6326 6060**

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

Changi General Hospital
SingHealth

Neighbours for Active Living

Partnering GPs to Provide Holistic Care for Residents in the East

General practitioners (GPs) often see patients whose recovery is hindered by social or personal circumstances. With the Neighbours programme, support is now available for GPs beyond the clinical setting to support patients in managing their health and well-being.

THE NEIGHBOURS PROGRAMME

The Neighbours for Active Living (Neighbours) programme aims to ensure that patients with complex health and social care needs continue to receive care in the community, after their discharge from the hospital.

Set up in 2013 by Changi General Hospital (CGH), the Neighbours team now consists of 50 community care professionals with social work and nursing backgrounds. Serving 18 communities in the East, it works closely with SingHealth Community Nurses as an integrated community care team to support the health and social care needs of residents referred by hospitals, general practitioners (GPs), polyclinics and social service agencies.

Images were taken before the COVID-19 pandemic

CASE STUDIES

A MDM K

70-year-old Mdm K sees a GP for her chronic conditions such as diabetes and poorly controlled hypertension. She lives alone, only occasionally visited by a niece.

Her GP, who has known her for a long time, was concerned about her slowly deteriorating health status. She referred her to the Neighbours team to help check on her well-being and to see if she can be encouraged to take better care of herself.

During home visits, we found out that Mdm K had difficulty remembering her medication regimen, and did not measure her blood pressure (BP) regularly. We therefore created a visual aid to help remind and guide her to take her medication, and to measure her BP.

As Mdm K also had some visual challenges, we created a log sheet big enough for her to see and easily fill in after measuring her BP. The team spent a few days walking through the whole process with her till she was able to remember to measure her BP daily. We also reminded her to bring her BP log to her GP, whom she continues to see every three months, for review.

As a result, Mdm K was able to keep her hypertension under control.

B MDM D

50-year-old Mdm D sees her GP for hypertension and diabetes. She had been self-managing quite well on her own but recently came to her GP, distraught. Mdm D shared that she was going through a crisis with her daughter, who refused to seek help for a suspected mental health condition which affected the latter's behaviour severely.

After the clinic visit, her GP requested the Neighbours team to help assess what was happening at home.

The Neighbours team visited Mdm D and was able to have a conversation with her daughter, who eventually agreed to her family taking her to a mental health specialist. She was diagnosed with clinical depression and treated in time.

This put Mdm D's mind at ease and she was able to refocus her energies on managing her own health conditions.

neighbours for Active Living

OUR SERVICES

- Conducting holistic assessments of clients' health and social care needs
- Conducting regular home visits to assess clients' conditions and safety
- Identifying and coordinating services and activities for clients with complex medical and social care needs
- Providing long-term monitoring and psychosocial support
- Engaging clients through wellness coaching to set and achieve their own health goals
- Championing social prescribing to link clients to relevant formal and informal networks or services that may support their overall well-being

WHO AND HOW GPs CAN REFER

Consider making a referral to Neighbours if you have patients who:

- Are recently discharged from the hospital, and require healthcare and/or social services coordination
- Need support to cope with the self-management of chronic diseases
- Are socially isolated and would benefit from befriender support
- Require transport, meals, a medical escort and/or healthcare assistance and is waiting for the services to be put in place
- Have caregivers requiring help to manage their care at home and can benefit from regular home visits by the Neighbours team

WE SERVE RESIDENTS LIVING IN THESE COMMUNITIES IN THE EAST:

Pasir Ris East and West	**Tampines Central, Changkat, East, West and North**	**Bedok**	**Changi-Simei**	**Fengshan**
Kampong Chai Chee	**Siglap**	**Eunos**	**Kaki Bukit**	**Marine Parade**
Kembangan-Chai Chee	**Joo Chiat**	**Geylang Serai**		

For referrals and enquiries, please email to neighbours@cgh.com.sg.

A Neighbours staff member will respond to you and maintain communication via phone call or email. The patient's progress will be fed back to the referring doctor when there are changes in his/her health and psychosocial status.

For more details on the **Neighbours programme**, please scan the QR code to visit the website.

Changi General Hospital
SingHealth

Pharmacist and Physician Collaborative Prescribing in the Community

The Changi General Hospital Experience

Contributed by:

Dr Patricia Lee
Director and Senior Consultant,
Home Medical Service

Ms Elena Lee
Principal Clinical Pharmacist,
Changi General Hospital

As healthcare increasingly moves into the community, greater collaboration between physicians and pharmacists can improve patient care. Find out how collaborative prescribing in the hospital-to-home service supports general practitioners in caring for patients in the community.

INTRODUCTION

With an ageing population and more complex patient profiles in Singapore, providing the best healthcare remains a challenge. There is also a greater need to move healthcare from hospitals into the community, as this keeps patients away from hospitals and helps them receive care in a familiar environment.

PHARMACIST AND PHYSICIAN COLLABORATIVE PRESCRIBING AT CGH

Changi General Hospital (CGH) was among the first hospitals in Singapore to pioneer a pharmacist and physician collaborative prescribing initiative under the **Hospital-to-Home (H2H) programme**. This initiative has been approved by the Ministry of Health (MOH) since October 2020.

Under this programme, CGH provides **medication reviews, drug optimisation** and **medication refills** for H2H patients using a **shared care model involving physicians and pharmacists**. Patients can be referred to collaborative prescribing in the H2H service by their general practitioner (GP), home medical doctor or community nurses.

Patients must meet the following eligibility criteria:

- Being of stable condition that requires regular monitoring and titration for chronic illnesses; *or*
- Having adherence problems that require medication review and coaching

THE EXPANDED ROLE OF PHARMACISTS

The traditional role of the pharmacist has evolved beyond the provision of medications, patient education, and reinforcement of adherence to medication therapy. Pharmacists who have undergone and passed the MOH's collaborative prescribing programme are able to prescribe medications to patients. With the skills and expertise in evidence-based practice and patient care, pharmacists can now assume new roles with a focus on patient care.

One of these expanded roles is in **prescribing medicine**. The potential benefits of expanded pharmacist prescribing include:

- Improvement of patient care
- Improved access to medication
- Optimisation of medication management
- Better resource utilisation

COLLABORATIVE PRESCRIBING

Expanded pharmacist prescribing is a new professional practice area for pharmacists. When the pharmacist visits patients at home, pharmacists with their specialised knowledge can **monitor the patients' responses** to their prescribed medications and **make appropriate dose titration suggestions**, where needed.

Medication reviews by pharmacists is the key area of the collaboration with physicians. Medication reviews after discharge from the hospital have reduced morbidity and mortality in patients. The evidence supporting the benefits of home medication reviews continues to expand.

Such reviews can be effective in the identification of medication-related problems among patients receiving treatment for chronic illnesses, as well as assist in the resolution of medication-related problems.

GENERAL PRACTITIONERS IN THE SHARED CARE MODEL WITH THE H2H SERVICE

A typical patient with multiple chronic medical problems can continue to be managed well by a GP with adequate community support and optimal utilisation of resources. Home care also alleviates the issue of commuting. In the context of advanced dementia or immobile patients with a complex medication regimen, the GP plays a primary role in supporting the family's navigation and coordination of care. The GP's familiarity with the referral pathway ensures that the patient receives the appropriate care through the linking up to relevant resources in the community.

CONCLUSION

The roles of the doctor and pharmacist are complementary. A collaborative and good working relationship is essential to the delivery of personalised and effective patient services and enabling greater responsiveness to changing patient needs.

Pharmacists have the skills and knowledge to contribute to the quality use of medicines, to minimise medication misadventure and to help patients better manage their medicines. With improved collaboration through improved inter-disciplinary communication and relationships, optimal medication management for the patient can be achieved.

The pharmacist and physician collaborative prescribing initiative is one such inter-professional collaboration in the evolving landscape to meet the medication management and healthcare needs of the community now and in the future.

HOW TO REFER A PATIENT

For GP referrals to the Hospital-to-Home Service at CGH, please call the hotline at **6426 8088**.

SingHealth DukeNUS ACADEMIC MEDICAL CENTRE
Lung Centre

Patient-Centred, Multidisciplinary Care for Thoracic Conditions

The SingHealth Duke-NUS Lung Centre

The SingHealth Duke-NUS Lung Centre was established to provide multidisciplinary and seamless care, as well as a single referral channel for all thoracic conditions.

ABOUT THE SINGHEALTH DUKE-NUS LUNG CENTRE

The Lung Centre is focused on delivering quality clinical care in the areas of airway diseases, complex lung diseases, pulmonary infections and thoracic oncology. This is enabled by strong support from thoracic support services, including diagnostic radiology, thoracic pathology, anaesthesiology and allied health.

The Centre is helmed by the following specialties:

- Respiratory and Critical Care Medicine
- Thoracic Surgery
- Medical Oncology
- Radiation Oncology

The Centre forms a unique platform for the collaborative work of a multidisciplinary team of healthcare professionals to meet the needs of the patient throughout the disease trajectory. Cases are discussed at multidisciplinary meetings, where the team of specialists is experienced in the assessment and management of complex lung diseases and tumours.

Besides providing clinical services to the local population, it is also a regional referral centre and a centre for clinical research.

The Centre is also actively involved in education and research, and participates in multicentre trials to provide patients with more therapeutic options and enhance medical knowledge.

Our Services

Airway Diseases
- Bronchiectasis Clinic
- Chronic Obstructive Pulmonary Disease (COPD) Clinic
- Severe/Difficult-to-treat (DTT) and Asthma Clinic

Complex Lung Diseases
- Chronic Non-invasive Ventilation Clinic
- Interstitial Lung Disease Clinic
- Lung Transplant Clinic
- Occupational Lung Disease Clinic
- Pulmonary Hypertension Clinic

Pulmonary Infections
- Diagnostic Bronchoscopy
- Multidisciplinary Radiology Meetings
- Pulmonary Infections Clinic

Thoracic Oncology
- Co-location of the Thoracic Surgery Ambulatory Clinics with Respiratory Medicine
- Multidisciplinary Tumour Boards

Thoracic Support Services
- Allergy Testing
- Cardiopulmonary Exercise Testing
- Interventional Pulmonology
- Pulmonary Rehabilitation
- Pulmonary Physiology
- Respiratory Therapy Services
- Smoking Cessation Programme (CGH, SGH, SKH)
- Thoracic Radiology (Including CT-guided Biopsies)

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

Singapore General Hospital	Changi General Hospital	Sengkang General Hospital	KK Women's and Children's Hospital	National Cancer Centre Singapore
6326 6060	6788 3003	6930 6000	6692 2984	6436 8288

Website: www.singhealth.com.sg/lung-centre

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Specialist Promotions & Appointments

Singapore General Hospital
SingHealth

Appointments: 6326 6060 | Email: gpnetwork@sgh.com.sg

NEW APPOINTMENTS

Assoc Prof Ruban Poopalalingam
Senior Consultant, Anaesthesiology;
Chairman, Medical Board, SGH;
Deputy Group Chairman Medical Board (DGCMB), SingHealth

Clin Assoc Prof Tan Hiang Khoon
Senior Consultant, Head & Neck Surgery;
Chairman, Division of Surgery & Surgical Oncology, SGH;
Group Director, International Collaboration Office (ICO), SingHealth;
Director, SingHealth Duke-NUS Global Health Institute (SDGHI)

Dr Gan Wee Hoe
Head & Senior Consultant, Occupational & Environmental Medicine;
Chief Medical Informatics Officer (CMIO), SGH;
Deputy Group Chief Medical Informatics Officer (Acute Care), SingHealth

Dr Goh Su-Yen
Senior Consultant, Endocrinology;
Clinical Director, Department of Future Health System

Assoc Prof Lim Chwee Ming
Senior Consultant, Otorhinolaryngology - Head & Neck Surgery;
Director, Clinical Translational Research

APPOINTMENT – CONSULTANT

Dr Tan Teck Kiang Malcolm
Consultant
Dept
Gastroenterology & Hepatology

APPOINTMENTS – ASSOCIATE CONSULTANTS

Dr Jayanthi D/O Karunanithi
Associate Consultant
Dept
Anatomical Pathology

Dr Ng Qiao Ming, Rachel
Associate Consultant
Dept
Geriatric Medicine

Dr Li Zongxian
Associate Consultant
Dept
Orthopaedic Surgery

Dr Lim Yee Gen
Associate Consultant
Dept
Orthopaedic Surgery

Dr Eng Yong Tai, Leonard
Associate Consultant
Dept
Psychiatry

Dr Du Jingzeng
Associate Consultant
Dept
Urology

Changi General Hospital
SingHealth

Appointments: 6788 3003 | **Email: cgh.com.sg**

NEW APPOINTMENTS

Dr Ang Shiang-Hu
Chief & Senior Consultant
Dept
Accident & Emergency
Sub-specialty
Critical Care/Emergency Ultrasound

Dr Wong Kang Min
Chief & Senior Consultant
Dept
Diagnostic Radiology
Sub-specialty
Abdominal Imaging

APPOINTMENT – CONSULTANT

Dr Salim Murtaza Esuffali Anjarwalla
Consultant
Dept
Laboratory Medicine
Sub-specialty
Histopathology

APPOINTMENTS – ASSOCIATE CONSULTANTS

Dr Choo Kuan Swen
Associate Consultant
Dept
Endocrinology

Dr Boo Ho Chin
Associate Consultant
Dept
Orthopaedic Surgery
Sub-specialty
Trauma/
Adult Reconstruction

Dr Chew Zhihong
Associate Consultant
Dept
Orthopaedic Surgery
Sub-specialty
Spine

Dr Tham Keng Seng
Associate Consultant
Dept
Psychological Medicine

Sengkang General Hospital
SingHealth

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

APPOINTMENT – SENIOR CONSULTANT

Dr Thomas Anjula Nee Khandelwal
Senior Consultant
Dept
Pathology

Specialist Promotions & Appointments

APPOINTMENTS – ASSOCIATE CONSULTANTS

Dr Lim Wei-An Joel
Associate Consultant
Dept
Orthopaedic Surgery

Dr Feng Jiajun
Associate Consultant
Dept
Plastic, Reconstructive & Aesthetic Surgery Service

KK Women's and Children's Hospital
SingHealth

Appointments: 6692 2984 | Email: centralappt@kkh.com.sg

NEW APPOINTMENTS

Dr Tan Keng Leng, Deborah
Head & Consultant

Ophthalmology Service

Adj Asst Prof Rajeswari Kathirvel
Head & Consultant

Urgent O&G Centre

Dr Chua Hong Liang
Head & Senior Consultant
Dept
Urogynaecology

Clin Prof Victor Samuel Rajadurai
Emeritus Consultant

APPOINTMENTS – ASSOCIATE CONSULTANTS

Dr Loh Sin Wee (Lu Xinwei)
Associate Consultant

Children's Intensive Care Unit

Dr Ang Siok Hoon (Hong Shuwen)
Associate Consultant
Dept
Emergency Medicine

Dr Tan Ziwei, Joyce
Associate Consultant
Dept
Emergency Medicine

Dr Chow Wen Hann (Zhou Wenhan)
Associate Consultant

General Paediatrics Service

National Heart Centre Singapore
SingHealth

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

PROMOTION – SENIOR CONSULTANT

Clin Asst Prof Fam Jiang Ming
Senior Consultant

Dept
Cardiology

Sub-specialty
Interventional Cardiology

National Neuroscience Institute
SingHealth

Appointments:
(SGH Campus) 6326 6060
(TTSH Campus) 6330 6363

Email:
gpnetwork@sgh.com.sg
appointments@nni.com.sg

NEW APPOINTMENT

Dr Ng Yew Poh Vincent
Senior Consultant;
Head, Ambulatory Services

Dept
Neurosurgery

Sub-specialties
Skull Base Surgery, Cerebrovascular Surgery, Neurotrauma

APPOINTMENT – ASSOCIATE CONSULTANT

Dr Dang Jiaojiao
Associate Consultant

Dept
Neurology
(TTSH Campus)

Sub-specialty
General Neurology

Singapore National Eye Centre
SingHealth

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

APPOINTMENT – SENIOR CONSULTANT

Dr Sharifah Zainah Alsagoff
Senior Consultant

Dept
Cataract and Comprehensive Ophthalmology

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 DM2101.

SingHealth

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

With 42 clinical specialties, a network of 4 Hospitals, 5 National Specialty Centres, 9 Polyclinics and 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)
- Psychiatry
- Clinical Epidemiologist

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
- Anaesthesia & Surgical Intensive Care
- Accident & Emergency
- Ophthalmology
- Diagnostic Radiology
- Orthopaedic Surgery
- General Surgery
- Urology
- General Medicine

Associate Consultants
- Renal Medicine
- Gastroenterology & Hepatology
- Orthopaedic Surgery

Website: www.cgh.com.sg
Email: medical_hr@cgh.com.sg

Sengkang General Hospital

Departments seeking:
Resident Physicians and Staff Registrars
- Anaesthesiology
- Cardiology
- Emergency Medicine
- Surgery
- General Medicine (with interest in Dermatology and Palliative Medicine)
- Intensive Care Medicine
- Orthopaedic Surgery (with interest in Hand Surgery and Orthopaedic Surgery)
- Otorhinolaryngology - Head & Neck Surgery
- Plastic, Reconstructive & Aesthetic Surgery Service
- Urology

Senior Consultant, Consultant, Associate Consultant
- Intensive Care Medicine
- Radiology
- Pathology
- Urology

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/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

Staff Registrars
- Paediatric Surgery

Family Physician
- Family Medicine

Resident Physicians
- Emergency Medicine
- Orthopaedic Surgery
- Otolaryngology
- Paediatric Surgery

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

National Cancer Centre Singapore

Departments seeking Resident Physicians
- Breast Surgery
- SingHealth IMU

Website: www.nccs.com.sg
Email: HR-Clinical@nccs.com.sg

National Heart Centre Singapore

Departments seeking Resident Physicians
- Cardiology
- Cardiothoracic Surgery

Website: www.nhcs.com.sg
Email: lim.bee.kuan@nhcs.com.sg

National Neuroscience Institute

Departments seeking Resident Physicians and Service Registrars
- Neurology
- Neuroradiology
- Neurosurgery

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

Singapore National Eye Centre

Department seeking
- Resident Physician, Ophthalmology
- Clinical Associate

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

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

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

Department seeking:
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
Email: schrecruitment@singhealthch.com.sg

Common Eye Conditions:

How to Manage and When to Refer

GPFirst CME Webinar

Changi General Hospital
SingHealth

How can general practitioners best manage common eye conditions seen in their practice, and when is specialist referral needed?

Join us for this webinar presented by Changi General Hospital which will address these questions and more.

Topics include:

- Ophthalmology in a nutshell - an approach to common eye conditions
- Teary and watery eyes
- Floaters, flashes and retinal detachment
- Overview of glaucoma
- Updates on the management of diabetic eye diseases and telemedicine screening

Date	Time	Hosted via	2 CME
		Zoom	points
17 April 2021	2pm to 4pm	Webinar	awarded

Free admission

For enquiries, please contact:

Ms Lyndia Lee at **lyndia.lee.s.h@singhealth.com.sg**, or

Ms Nurazila Binti Zakaria at **nurazila_zakaria@cgh.com.sg**.

Scan the QR code to register.

Paediatric Dermatology Online Workshop 2021

KK Women's and Children's Hospital
SingHealth

Join us for an insightful look into the latest treatments and advances in the diagnosis and management of common dermatology conditions in children.

The two-day webinar will encompass two teaching tracks on basic and advanced paediatric dermatology, quizzes, two tracks for residents and nurses, and sponsored tea and lunch symposia sessions.

Date	Hosted via	CME and	Registration
	Zoom	SNB-CPE points	Closes on **18 May 2021**
22 and 23 May 2021	Webinar	will be awarded	**(Tuesday)**

Course Fees

$15 per participant *(Free registration for all SingHealth staff / trainees / residents / DSS, SPS and ASPD members)*

Register now!
Scan the QR code or log on to **www.kkh.com.sg/events** for more details.

For enquiries, please email to **marcoms@kkh.com.sg**

CMEs & Courses

9th Singapore International Parkinson Disease & Movement Disorders Symposium

National Neuroscience Institute
SingHealth

Join us at this year's virtual symposium which will focus on the causes, diagnosis and management of Parkinson disease (PD) and movement disorders.

Started in 2002, this biennial symposium brings together leaders in PD and movement disorders from across the world to share the latest research findings and best practices in patient care with clinicians, scientists, nurses and allied health professionals.

The 2021 Symposium has two segments:

1. **Satellite Symposium** on translational research in Parkinson disease and deep brain stimulation (DBS)
2. **Main Symposium** with plenaries, parallel sessions, workshops and video presentations

Invited renowned international experts include:

- Prof Rajeshwar Awatramani
- Prof Francisco Cardoso
- Prof Ted M. Dawson
- A/Prof Taku Hatano
- Dr Neil Mahant
- Prof Eleno Moro
- Prof Lynn Rochester
- Prof Daniela Berg
- Dr Mark Cookson
- Prof Marina Emborg
- Prof Lin Chin Hsien
- Prof Paul Matthews
- Dr Chandrasekhara Pillai Padmakumar

Date
6 - 8 May 2021 (Thursday - Saturday)

Hosted virtually

Up to 12 CME points will be awarded to participants upon verification of online attendance by the organisers.

Course Fees			
Registrant	Physicians and researchers	Trainees, nurses, allied health and other medical professionals	Members of the NNI Community Care Partners Programme
Fees	$80.00	$50.00	$30.00

Scan QR code for registration details.

For queries, please contact:
9th Singapore International Parkinson Disease and Movement Disorders Symposium Secretariat
National Neuroscience Institute
1 Jalan Tan Tock Seng, Singapore 308433
Email: eventsecretariat@nni.com.sg

HOTLINES

SingHealth

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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