What were the main driving factors for establishing the ASRCC?

We recognised the market demand in the ASEAN region. There is a high prevalence and a relative under-diagnosis of sleep disorders in Malaysia. Sleep disorders are preventable and treatable conditions, and there is potential to yield very good patient outcomes if systematically managed, coordinated and developed. One main purpose of establishing the ASRCC was to encourage more collaboration and partnership within various stakeholders involved in the diagnosis and therapeutic aspects of sleep disorders.

In addition, a knowledge and services gap exists. The domain is extremely fragmented among a few sub specialties such as psychiatry, neurology, ENT surgery, respiratory medicine, anaesthesiology. It is hoped that the ASRCC will help achieve more cohesiveness in the management of sleep disorders in the region.

What are the core aims or objectives of the ASRCC?

The three main aims of ASRCC involve patient care, research and education:

Care: To develop a comprehensive sleep disorder service (covering both diagnostics & therapeutics) so that ASEAN patients can be diagnosed in a timely & accurate fashion, and optimally treated.

Research: To promote multi-disciplinary research within this new subspecialty.
Sleep disorders are preventable and treatable conditions, and there is potential to yield very good patient outcomes if systematically managed, coordinated and developed. The three main aims of ASRCC involve patient care, research and education.

**Education:** To establish a formal training curriculum for sleep expertise (technologists & specialists).

**Please outline the main initiatives which constitute the ASRCC.**

**Awareness:** One of ASRCC’s main goals is to increase public awareness of sleep disorders and a healthy “sleep” lifestyle.

**Corporate Services Centre:** We are working to establish a network of ASRCC-affiliated Sleep Centres in the region. ASRCC will collaborate with other centres in the country to improve the accessibility to sleep facilities, resources and expertise.

**Telemedicine Centre:** We are expanding the reach of the sleep expertise and services at ASRCC through the telemedicine modality, using reliable and affordable virtual diagnostics.

**Training Academy:** There is an acute shortage of trained technologists and physicians with the appropriate expertise. We are working to establish formal & regular training programmes for Polysomnographic Technologists and specialist physicians through Continuous Medical Education (CME) and formal certificate and postgraduate programmes.

**Clinical Research Centre:** The ASRCC encourages and promotes research in Sleep Medicine, especially within academia. Activities include allocation of research grants to MSc, PhD candidates and Post-doctoral researchers.

**What are the main types of disorders treated at the ASRCC?**

At ASRCC we treat all primary and secondary sleep disorders. The most common problems with which patients present are OSA, parasomnias (for example, somnambulism or night terrors), and insomnias (sometimes caused by clinical depression).

**Can you comment on the Centre’s current case load?**

ASRCC will incrementally increase its case volume. We have the capacity to handle 1,000 patients during formative years and will scale up to 5,000 patients once infrastructure & manpower support are optimised. We expect that the centre will be relocated to UM Health Metropolis in 5 years time, which will house the largest centre in the region with a capacity to manage a minimum of 10,000 cases per annum.

**Why did you choose to collaborate with Philips in establishing this centre?**

We have a shared vision and the same level of enthusiasm for excellence in sleep disorder management. We share many similarities in work culture, and certainly feel the same burden about the “epidemic” of sleep disorders in the region. Additionally, Philips brings superior technology to the table, along with the drive to collaboratively innovate alongside academia.

**How widespread do you anticipate the ASRCC’s reach to extend?**

ASRCC has a regional focus. We are beginning in Malaysia, and working to address all nationwide sleep-related issues; once our model is refined, it can be replicated in other ASEAN countries such as Indonesia, Thailand and the Philippines, and in other emerging economies (for example, Vietnam and Myanmar).

ASRCC will also work to further strengthen our collaborative relationship with other centres of excellence in the US, Europe and Australia. Through these partnerships, we can further expand the reach of our initiatives beyond the ASEAN region to the wider Asia Pacific region, including Greater China.

It is important to note that sleep does have a strong cultural element. There are many cities that “never sleep” and it is culturally acceptable to be chronically sleep-deprived. It is therefore important that we appropriately localise our strategies when introducing the ASRCC model into each country.

**How do you anticipate the establishment of the ASRCC will help drive awareness of sleep disorders in the ASEAN region?**

ASRCC has a strong emphasis on education and research. Through academic collaboration and educational activities, we aim to “seed” awareness of sleep technologists and sleep specialists in different countries. We will also be leveraging the social media platform as a public health tool to create awareness. During World Sleep Day, we plan to intensify our participation and activities.

**The ASRCC is working towards sleep disorder screening initiatives for drivers of public vehicles. Can you comment on the purposes and progress of this project, and the Centre’s goals for its future success?**

OSA is very prevalent among commercial vehicle drivers in Malaysia. A recent study has estimated up to 1/3 of these drivers have sleep disorders – mainly OSA among Malaysian drivers. This project involves public education, along with policy and regulation change in multiple government agencies. We are working to establish mandatory screening of commercial drivers and imposing compulsory rest requirements. We believe this project will have a profound impact upon awareness and outcomes.

For more information: Website: www.aseansleep.com
Email: info@aseansleep.com, sleeptraining@umsc.my
Dr Thun-How Ong is Director of the Sleep Disorders Unit and Senior Consultant at the Department of Respiratory and Critical Care Medicine at Singapore General Hospital. She also serves as Adjunct Assistant Professor at both Duke-NUS Graduate Medical School and the Yong Loo Lin School of Medicine at the National University of Singapore. Dr Ong has completed a fellowship in sleep medicine at Brown University in Rhode Island, United States. A member of the American Association of Sleep Medicine, the American College of Chest Physicians and the Singapore Thoracic Society, she has authored or co-authored 11 publications, presented at several international congresses, and has been involved in various sleep symposia, societies and initiatives in Singapore.

Selection of the right mask for PAP therapy

Dr Thun-How Ong

What are the different types of masks used for Continuous Positive Airway Pressure (CPAP) therapy?

There are many kinds of masks in general clinical use. The most common masks used for long-term nocturnal CPAP are nasal pillows, nasal masks and naso-oral masks. The masks themselves are made of a variety of materials ranging from silicone to gel; there are even masks available which are made of a soft cloth.

What are the criteria for selection of a suitable mask for a particular patient?

Mask selection depends partly upon patient preference. The facial characteristics of the patient are also important to consider; for example, an oronasal mask would not be suitable for a patient who is edentulous (toothless) or has a beard, whereas a thick moustache may make it difficult to fit a nasal pillow or nasal mask. For each mask type, the appropriate size must also be selected.

What are the features of an ideal mask?

First, a mask needs to be comfortable for the patient to wear. Leakage should be minimal, but the mask should not exert undue pressure on the patient’s skin. Masks also need to be easy for a patient to put on and take off unassisted, and should be reasonably long-lasting and durable. Last but not least, the mask should also be affordable for the patient.

Are there any differences in facial phenotypes of different ethnic populations which should be taken into account when prescribing a mask for PAP therapy?

This is an interesting area which is not well studied as yet.

Are there any studies that discuss which type of mask to use during titration of CPAP?

There are a couple of studies comparing CPAP masks. In a recently-published French study in newly CPAP-treated patients with OSA, more patients who were given oronasal masks were non-compliant, and, for this reason, nasal masks were preferred. It is important to note, however, that this was an epidemiological study and its findings must be interpreted in context. There is no certainty regarding cause and effect in such a study; for example, were the patients prescribed oronasal masks because they were already non-compliant?

It is well-accepted that many patients prefer nasal masks to oronasal masks; indeed, the majority of patients seen at our centre are using nasal pillows or nasal masks rather than full face masks. However, oronasal masks may still be more suitable for some patients; for example, when treatment pressures are high, or in cases of acute bi-level ventilation, where patients are more breathless and may be more likely to mouth-breathe.

Managing the burden of obstructive sleep apnea: An Asia-Pacific perspective

Prof Doug McEvoy

How is the worldwide prevalence of OSA changing over time, and why?
The prevalence of OSA is increasing worldwide due to increasing rates of obesity and an ageing demographic in many countries. A recent report from the Wisconsin Sleep Cohort Study suggests that the prevalence of OSA (defined as AHI > 15 events/h) has increased by almost 50% in the United States over the last two decades.1

What is the prevalence and estimated burden of OSA in the Australian and ASEAN population?

There are limited data on the prevalence of OSA in the Australian population and no OSA prevalence data of which I am aware in ASEAN countries. In a 1995 Australian study of men chosen at random from a non-urban community in Western Australia, the estimated prevalence of OSA (i.e. respiratory disturbance index > 10 events per hour) was 10%. In a 2011 study (Adams R et al, unpublished) amongst men chosen at random from Adelaide, an Australian urban population, approximately 25% of men older than 40 years had previously undiagnosed OSA (apnea-hypopnea index [AHI] > 20 events/hour) with a further 9% reporting that they had already been diagnosed with OSA by sleep study.

While similar data are lacking for ASEAN countries, prevalence studies conducted in India, China and Korea suggest that Asian populations have similar levels of OSA to those found in Australia, North America and Europe – this is despite generally lower rates of obesity. This may in part be explained by the craniofacial structure of some Asian persons, which predisposes them to more upper airway obstruction during sleep. Interestingly, a 1998 population survey of OSA symptoms among residents of Singapore showed quite marked differences in self-reported snoring and witnessed apneas amongst Chinese, Malay and Indian participants.

The prevalence of OSA is increasing worldwide... Asian populations have similar levels of OSA to those observed in Australia, North America and Europe.

At the severe end of the OSA spectrum... patients may have an increased risk of future cardiovascular events such as acute coronary syndrome, heart failure and stroke.
The most important consequences of leaving OSA untreated? 

The most important consequences of leaving a patient with symptomatic OSA untreated are the lost opportunities to improve quality of life, enhance productivity and reduce the risk of accidents due to a microsleep or inattention. These complications of OSA are much more likely in patients with AHI>30.

What are the likely consequences of leaving OSA untreated? 

What are the likely consequences of leaving OSA untreated? There is a need for greater awareness of the importance of OSA management through nurse sleep practitioner training. AHI>30 events/hour of sleep) there is a much higher likelihood of future cardiovascular events such as acute coronary syndrome, heart failure and stroke.

Which health professionals most commonly diagnose OSA in Australia and ASEAN, and how are these patients currently managed? 

In Australia and ASEAN, respiratory and sleep physicians are most commonly responsible for OSA diagnosis, although some ear; nose and throat surgeons who have taken a special interest in OSA are also involved. In Australia, general practitioners are beginning to take a greater interest in the diagnosis of OSA and its management.

What role do nurses play in the management of OSA? 

Trained nurses have played a pivotal role in CPAP therapy for many years. Sleep laboratory scientists and technicians also have had a significant role in helping to start OSA patients on CPAP. Nurses have important clinical skills that can be utilised to advise patients on the management of co-existing respiratory disease (for example, smoking cessation, bronchodilator aerosol techniques and oxygen therapy) and in lifestyle modification (for example, weight reduction). Our group has encouraged a deeper involvement of nurses in OSA management through nurse sleep practitioner training courses. This enables an advanced level of practice including diagnostic screening, advice on sleep hygiene and treatment of overlapping disorders such as insomnia and restless legs syndrome.

What are some challenges faced by healthcare practitioners in managing the burden of OSA? 

What are some challenges faced by healthcare practitioners in managing the burden of OSA? The major challenge facing healthcare practitioners is how to reach the very large number of people in the community who have undiagnosed OSA, and identify from among this group those who will benefit from treatment. The latter question can only be fully resolved by data from ongoing randomised controlled trials such as the Sleep Apnea cardioVascular Endpoints (SAVE) study that are designed to evaluate whether the incidence of future cardiovascular events and metabolic diseases such as diabetes can be reduced by OSA treatment. In the meantime, it is important to identify those with OSA whose vigilance, safety and quality of life is impaired, and provide for them acceptable and effective treatment.

What can we do to best address these challenges? 

What can we do to best address these challenges? There is a need for greater awareness of the importance of OSA at the community level and among the medical profession. It is important, however, in formulating education campaigns, that the evidence with respect to the health impacts of OSA is not overstated. The focus in my opinion in such campaigns should be on trying to identify and offer treatment to those patients with at least moderately severe sleep disordered breathing who are functionally impaired during the day due to chronic tiredness. It should not be forgotten, however, that daytime sleepiness is a non-specific symptom and is reported by approximately one in five adults who do not have OSA. Careful clinical assessment of patients with OSA and daytime sleepiness is therefore essential to exclude or manage other or overlapping causes of sleepiness such as lifestyle-related chronic sleep deprivation, co-existing depression and other sleep or medical disorders. To properly address the clinical needs of patients will therefore require an up-skilling of the medical workforce, and because of the high prevalence of OSA, the involvement of a broad base of healthcare professionals including general practitioners and specialist nurses. Advocacy by sleep patients and professionals to government, third-party healthcare providers and medical educators will be needed if these goals are to be achieved.

Would you please outline the background and findings from your recent study published in JAMA regarding primary care versus specialist sleep centre management of OSA? 

This study was a proof-of-concept randomised comparative effectiveness trial. It showed that with suitable training and support from specialist sleep practitioners, general practitioners and their practice nurses could identify and manage uncomplicated, symptomatic, moderate-to-severe OSA patients as effectively as sleep specialists in a tertiary referral centre. The improvement in daytime sleepiness among patients managed in primary care was not inferior to that achieved in patients referred to the specialist sleep centre, and the treatment outcomes were achieved at a reduced cost.

We deliberately targeted patients with symptomatic, moderate-to-severe sleep disordered breathing, without comorbidities such as chronic respiratory disease or heart failure, believing they would be an ideal patient group for general practice management. Such patients have the most to gain from treatment and are often the most compliant and responsive to therapy. In so doing, we believed it should be possible to free up the time of sleep specialists to attend to “complicated” OSA patients, for example, patients with overlapping medical or other sleep disorders, or those who fail conventional OSA therapy.

How do you think this model could be applied across other healthcare settings and funding environments? 

In general, countries and healthcare systems, which do not currently have well-developed, specialist-centric models of OSA care and entrenched ideas regarding professional
The improvement in daytime sleepiness among patients managed in primary care was not inferior to that achieved in patients referred to the specialist sleep centre, and the treatment outcomes were achieved at reduced cost.

competence, privilege and reward, are in an ideal position to develop from the “ground up” spoke-and-hub models of care that include a much broader base of health professionals working in co-operation with sleep specialists that exists, for instance, in countries such as Australia and the United States. Such models of care have the opportunity to fully embrace ambulatory OSA screening and treatment programs, thereby reducing costs and extending the reach of sleep services to the very large body of undiagnosed OSA.

What are the key factors that could make this model successful in Australia?

The model of care tested by us in the JAMA study has not yet been rolled out generally in Australia. There is much yet to be done to change clinical practice to encompass this community based model of care. A coordinated effort will be required and a readiness to change. Education of general practitioners, nurses and allied health professionals will need to be enhanced, and professional guidelines, government and health policy and funding arrangements adjusted.

Education of general practitioners, nurses and allied health professionals will need to be enhanced, and professional guidelines, government and health policy and funding arrangements adjusted.


Seven essential updates: Servo ventilation and heart failure

Dr Teofilo L. Lee-Chiong Jr., MD

Several important publications have advanced our understanding of adaptive servo ventilation (ASV) and crystallised its important role in the management of patients with heart failure and sleep disordered breathing. Not only has ASV been demonstrated to enhance cardiac function in this population, beneficial effects on cardiac arrhythmias, renal function, exercise capacity and sympathetic nervous activity have also been noted. The seven most essential articles on ASV and heart failure (HF) in the last 12 months are summarised below:

Dr Teofilo L. Lee-Chiong Jr., MD, is Professor of Medicine at National Jewish Health in Denver and at the University of Colorado Denver School of Medicine. He is also currently the Chief Medical Liaison for Philips Respironics. He has authored or edited 16 textbooks in Sleep Medicine and Pulmonary Medicine and has authored and co-authored more than 170 publications. In addition, he developed and serves as the consulting editor for Sleep Medicine Clinics journal, while also serving as an editorial board member and reviewer of several other medical journals and publications.

He has served as the Chair of the Nosology Committee of the American Academy of Sleep Medicine (AASM), vice-chair of the Associated Professional Sleep Societies LLC (APSS) Program Committee, and Chair of both the Sleep Medicine Network and Sleep Institute Steering Committees of the American College of Chest Medicine (ACCP). He also has served on the Council of Governors for the ACCP.
ASV improved both cardiac function and physical capacity in 51 patients with HF (left ventricular ejection fraction [LVEF] ≤ 40%) and persistent Cheyne-Stokes respiration (CSR), despite optimal cardiac medical management. ASV treatment was associated with improvements in LVEF (32 ± 11% [baseline] vs. 36 ± 13%; P = 0.013), 6-minute walk test (6MWT; 377 ± 115 [baseline] vs. 430 ± 123 m; P = 0.014) and New York Heart Association (NYHA) class (3.2 [3.0-3.0, baseline] vs. 2.0 [2.0-3.0]; P < 0.001). No changes were seen in the control group.1

Frequenzy of premature ventricular complexes (PVCs) was reduced by ASV therapy in 19 patients with comorbid HF and sleep-disordered breathing. Compared with baseline, the frequency of PVCs decreased during sleep and across a 24-hour period (from 40.5 vs. 21.9 beats/hour; P = 0.013) during ASV treatment. Therapy was also associated with decreased urinary catecholamines (0.466 to 0.353 mg/day; P = 0.016) and decreased sympathetic nervous activity across a 24-hour period (2.8 to 1.9; P = 0.017).2

Cardiorenal function in 80 patients with HF, chronic kidney disease and SDB was improved by usual care plus ASV therapy compared with usual care alone. Levels of brain natriuretic peptide (BNP), a measure of heart failure, cystatin C (a biomarker of kidney function), C-reactive protein (CRP, an acute phase protein) and noradrenaline decreased, and both glomerular filtration rate (GFR) and LVEF significantly improved after 6 months of ASV therapy (P < 0.05 for all comparisons); these remained unchanged with usual care alone. ASV was also associated with significantly higher event-free rate (deaths and rehospitalisations) compared to usual care.3

ASV therapy improved apnea hypopnea index (AHI), oxygen saturation (SaO2), NYHA status, exercise capacity and cardiac functional status in 45 HF patients with moderate-severe SDB (combined central and mixed apneas). AHI improved from 42.8 ± 17.5/hour at baseline to 8.9 ± 5.8/h with ASV (P < 0.001). Similarly, exercise capacity (VO2 peak) increased from 13.64 ± 3.5 to 15.8 ± 5.8 ml/kg/min (P < 0.002).4

ASV plus medications resulted in better outcomes in 36 patients with HF (with preserved LVEF) and SDB compared with medical therapy alone. ASV use was associated with improved cardiac diastolic function, decreased cardio-ankle vascular index (CAVI) and BNP, and higher event-free rate (94.4% vs. 61.1%).5

In patients with stable HF and SDB, ASV and optimal medical management significantly improved AHI and N-terminal pro BNP (NT-proBNP), but not LVEF or quality of life (QoL), compared to optimal medical management alone. At 12 weeks, ASV was associated with a greater reduction in NT-proBNP compared with controls (-360 ± 569 vs. +135 ± 625 ng/mL; P = 0.010). Both groups had similar improvements in LVEF (+3.4 ± 5 vs. +3.5 ± 6%; P = 0.915).6

In 10 patients with HF enrolled in a crossover study, ASV was more effective in reducing central sleep apnoea (CSA)-CSR than O2 therapy (2 L/min via nasal prongs). Compared to the latter; ASV was associated with lower median AHI (ASV, 1.4/h vs. O2, 13.4/h) and more patients achieving an AHI of less than 10/hour (ASV, 86% vs. O2, 29%). However, neither therapy significantly changed LVEF, BNP, urinary catecholamines, shuttle walk distance or symptoms.7

Why did you decide to become a sleep technologist?

Before I became a Sleep Technologist, I was actually a sleep patient without knowing much about the subject. I had undergone surgery for apnea correction, which unfortunately did not help me, and I experienced worse daytime sleepiness after surgery compared with before.

I was involved in a very bad car accident as a result of my sleep disorder. I dozed off while driving and flew over a bridge, ending up in hospital. During my time as an inpatient, I researched the internet to try to find reasons for my daytime sleepiness, and learned a lot about sleep disorders, sleep apneas and other sleep-related issues.

What is the most challenging aspect of your profession?

The most challenging parts of my profession are educating the public about sleep, and lobbying the Ministry of Health with regard to pay parity for Sleep Technologists.

What is the biggest change you have seen in the profession since you began?

There is now more public awareness with regard to sleep and sleep-related problems. The healthcare professionals are also beginning to show more awareness of the economic cost of sleep problems and the impact of these problems on the patients’ quality of life.

What factors do you feel influence patient adherence to CPAP?

Training is very important. Patients need to be educated well about their sleep disorder and the likely consequences of leaving the disorder untreated. If patients are properly taught about the CPAP device at the start, and guided through the process of adopting CPAP as part of their nightly routine, adherence is generally excellent. Selection of a properly sized and well-fitting mask for each patient is also crucial. It is very important to discuss patients’ expectations with regard to treatment, set goals with the patient, and address any concerns or issues at the earliest possible opportunity.

What factors tend to influence a patient’s choice of mask?

A mask needs to be simple to use, and have as few parts as possible to ensure ease of assembly and disassembly. Patient comfort is also very important – the mask should be comfortable and lightweight, with a secure seal, no pressure points, and well-designed headgear ensuring the mask stays firmly in place during sleep. Patients also prefer a mask that is easy to clean and maintain.

Ms Sorna Latha Kunchi Rama is Chief Sleep Technologist in the Sleep Laboratory at Putrajaya Hospital in Kuala Lumpur, Malaysia.

Prior to becoming a sleep technologist, Sorna worked as theatre nurse and was involved in anaesthetics, general surgery and endoscopy.