

SINGAPORE SLEEP REVIEW

SINGAPORE SLEEP SOCIETY NEWSLETTER

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SSS NEWS

With this issue of the SSS newsletter we are approaching the end of the year. With an exciting year ahead, we are looking forward to Singapore hosting the World Sleep Congress on September 5-10, 2025. In this issue of the Singapore Sleep Review, we highlight high-quality sleep research, including analyses of CPAP treatment, associations between sleep and obesity, and sleep during medical training in Singapore.

We would also like to draw your attention to the newly formed Asian Adult Sleep Medicine Training Curriculum, a multinational effort to formalize and standardize sleep medicine training across Asia. This initiative by the Asian Society of Sleep Medicine (ASSM) provides a standardized yet adaptable framework for sleep medicine training across diverse Asian healthcare contexts.



HEALTH SYSTEMS ECONOMICS

CPAP treatment of OSA found highly cost-effective on a health systems level

SLEEP AND THE WORKPLACE

Interview with Prof Christopher Barnes on the importance of healthy sleep in the workplace

SLEEP & OBESITY

Sleep quality, dozing, and snoring associated with adiposity in a Singapore multi-ethnic study

MEDICAL TRAINING

Study evaluated sleep, wellbeing and cognition for medical interns on an on-call or night-float schedule

The logo for the Asian Society of Sleep Medicine (ASSM), featuring a stylized yin-yang symbol in blue and white, with the text "ASSM" in large blue letters and "Asian Society of Sleep Medicine" in smaller red letters below it.

**Asian Adult Sleep
Medicine Fellowship Training
Curriculum**

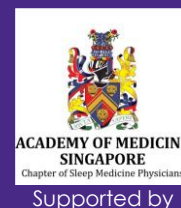
One Curriculum, Many Contexts



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CPAP treatment found highly cost-effective

Reference: Meng F, Ang GY, Chang RRY, Lee CP, Tan KB, Abisheganaden JA. Cost-effectiveness analysis of continuous positive airway pressure treatment for obstructive sleep apnea in Singapore from a health system perspective. J Sleep Res. 2024 Sep 3:e14326. <https://doi.org/10.1111/jsr.14326>

Obstructive sleep apnea (OSA) is prevalent, yet often goes undiagnosed and untreated. The downstream health consequences of untreated OSA can result in costs in terms health system costs, and indirect costs like lost productivity and accident risk. Taking into account such costs, is important to determine the cost-effectiveness of treatment and inform policymakers deciding on funding allocation.

The Singapore healthcare system is financed following a mixed model combining government subsidies, compulsory savings and private insurance. Approximately 80% of patients receive care in public hospitals or polyclinics, while 20% are treated in the private sector. The costs of buying a CPAP machine can be substantial and are currently not covered under state or private insurance, which can have a deterrent effect on patients seeking treatment.

A recent study, led by the Health Services and Outcomes Research department of the National Healthcare Group, mapped out the costs and savings associated with CPAP treatment on a health systems level. The analysis evaluated a 5-year care pathway, considering per-patient costs of treatment, and the health system cost savings of obstructive sleep apnea and attributed conditions, and averted Disability-Adjusted Life Years (DALYs). Per-patient costs were estimated at \$856 per year per case,

derived from the average annual costs of treatment managed at the Sleep Lab of Tan Tock Seng Hospital. For home diagnosis, these costs could be brought down to \$625. Health systems savings and averted DALYs from OSA and associated conditions was estimated as were estimated at \$77 per patient.


At the same time the total averted DALYs were estimated to be 0.0417 per patient. The DALYs represent the estimated years of life lost due to premature mortality or years lived with disability, under conditions of no-treatment. Specifically, DALYs were based on the effectiveness of CPAP treatment on OSA directly, and on associated conditions (here coronary heart disease; congestive heart failure; depression; diabetes; workplace accidents; vehicle accidents).

Combining these costs and savings, the incremental cost-effectiveness ratio (ICER) was calculated to be US\$ 13,822. The ICER represents the net costs of treatment divided by the DALYs averted (the effectiveness of treatment). This ratio is to be compared to the willingness-to-pay threshold, which indicates the maximum amount that the decision maker is willing to pay for the improvement in years of life gained (DALYs averted).

The willingness-to-pay threshold was determined at US\$50,000. Thereby CPAP treatment was estimated to be highly-cost effective (having an incremental cost ratio that is far lower than the willingness-to-pay threshold). Further analysis showed that treatment adherence levels far lower than the average weighted adherence levels reported in studies from Singapore (74.1), would still result in cost-effective ICER values.

G3 Series CPAP/BPAP

G3 series has intelligent, user-friendly features, is quiet and includes powerful data transmission. Intelligent device knows you better.



Preheated Humidifier




SmartC/A/B Pressure Adjustment



Various Ways of Sleep Report Review

Nasal Pillows Interface (P6)

- Circular dispersion vent
- Flexible short tube



Nasal Mask (N6)

- Under-the-nose cushion
- Three-point adjustable headgear




Full Face Mask (F6)

- Under-the-nose cushion
- Crown headgear with clips









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Sleep and workplace behavior: an interview with Prof Christopher Barnes

Dr. Christopher Barnes is a professor of Organizational Behavior at the NUS Business School. During his career he has extensively published on the effects of sleep on workplace behaviors. In 2019 he wrote a review in the journal *Sleep Medicine Reviews* titled "Why healthy sleep is good for business?" We interviewed Dr. Barnes about his work and career.

As sleep is not a common topic of study in the business environment, what motivated you to start studying sleep?

"I wish I could say that I had it all planned in advance. But the truth is that it was mostly a happy accident. I spent four years as an officer in the United States Air Force, in the Air Force Research Laboratory. I worked in the Fatigue Countermeasures branch. I found the topic fascinating. I had a civilian mentor there who was a PhD, and I wanted to be like her. So I applied to the same PhD program she came from, which was the Organizational Behavior program in the business school at Michigan State University. I was fortunate that the MSU program turned out to be a fantastic one. But while I was there, I saw that the organizational behavior research literature was almost totally lacking in content about sleep. Moreover, there were no business school researchers who were focused on sleep. That seemed wrong to me, so I decided to try to be the first business school professor to make sleep my primary research topic and conduct research about the relationship between sleep and work."

Topics that your work has covered include employee productivity, cyberloafing, and ethical behavior. Your studies show that people who lack sleep are more likely to slack off at work, less likely to persist in difficult tasks, and even have a higher tendency to cheat when the opportunity is given. This was true when sleep was experimentally restricted, but also when people lost sleep in their daily lives. What is it about sleep that helps to guard people against displaying these behaviors?



Prof Christopher Barnes

"Sleep has many effects, so a fully accurate answer to this question is not fully revealed. But central to many of these activities is the exertion of self-control. Self-control helps to keep us on task and help us to resist temptations. There is a robust research literature about the importance of sleep for self-control. Many of these work-focused outcomes are just manifestations of that."

In your more recent work, you shift the focus from employees to the leadership, showing that managers who are sleep deprived are perceived as less charismatic, have poorer interpersonal interactions with their subordinates, and even can negatively impact their subordinates sleep and workplace behaviors. How important do you think leadership and corporate culture are to promoting a healthy balance between productivity and sufficient rest?

"Leadership is centrally important. Often times our sleep community gives advice to people for how to improve their sleep. We lose sight of the fact that people..."

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"...are embedded in powerful social contexts, with powerful role models and powerful policies that shape the timing, duration, and quality of their sleep. It is very frustrating for people to receive advice about how to improve their sleep when their work just gets in the way of either implementing that advice or of the benefits of implementing that advice."

"We should still give them that advice (which is essentially a bottom-up approach), but we have to supplement that with a top-down approach as well. We have to convince leadership, up to the very top of organizations, that sleep is the path to better employees. The attitudes, behaviors, and examples from the top ripple through the rest of the organization. Essentially, we have to make the business case for sleep, which is what I have spent my career trying to do, and effectively communicate that business case to leaders."

One of your most remarkable findings is that lack of sleep can interfere with the capacity to generate and identify good investment opportunities. Participants tended to rank business venture ideas less accurately when they had insufficient sleep. Do you think this work challenges the idea that to be successful you will need to work when others are sleeping?

"Yes, findings like this highlight what I refer to as the quantity/quality tradeoff in the workplace. Mathematically, an employee can always spend more time working by spending less time sleeping. But this will come at the expense of the quality of the work, as well as other bad outcomes like mistakes, injuries, unethical behavior, poor creativity, and bad leadership."

"There may be some jobs in which quality does not matter. But for most jobs, quality does matter. Sacrificing that quality to work more hours is generally going to be a bad tradeoff, especially in the long run. The truth is that getting good quality sleep is the path to becoming your best self, including being your best self at work."

Read more

Reference: Barnes CM, Watson NF. Why healthy sleep is good for business. *Sleep Med Rev.* 2019. <https://doi.org/10.1016/j.smrv.2019.07.005>

Ben Simon E, Vallat R, Barnes CM, Walker MP. Sleep Loss and the Socio-Emotional Brain. *Trends Cogn Sci.* 2020 Jun;24(6):435-450. <https://doi.org/10.1016/j.tics.2020.02.003>

TEDxOregonStateU: [Sleep and Work, Dr. Chris Barnes \(2016\)](#)

The Matt Walker Podcast: [#75 - The Business of Sleep With Dr. Chris Barnes](#)



As an associate member society of the World Sleep Society, SSS members have free access to Sleep Medicine

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Sleep and adiposity in a Singapore multi-ethnic study

Reference: Lam, *et al.* The relationships between sleep and adiposity amongst multi-ethnic Asian populations: a cross-sectional analysis of the Health for Life in Singapore (HELIOS) study. *Int J Obes*(2024).
<https://doi.org/10.1038/s41366-024-01666-5>

Short sleep and poor sleep quality have been associated with obesity. In a study by the Lee Kong Chian School of Medicine, Nanyang Technological University (NTU), this relationship was examined in a multi-ethnic population-based cohort. Data from 8876 Singaporeans and permanent residents aging 30-84 years old, were included. Participants were recruited through multiple community-based engagements to ensure representation of ethnic minority, working-age, and lower socio-economic groups. Body-mass index and waist circumference were measured.

Based on survey responses, an average sleep duration of 6.27 hours was measured. Fifty-one percent of respondents reported insomnia symptoms (36.7%), dozing (1.4%), napping (16.2%), snoring (11.6%), or a combination (12.9%).

Results showed that BMI and waist circumference were higher amongst people with short sleep, poor sleep quality, insomnia, dozing, daytime napping and snoring compared to people without these sleep traits. The strongest association was seen for snoring. Sleep duration, quality, and snoring were linked to BMI and waist size, independent of age, sex, ethnicity, and remained significant adjusting for lifestyle and health factors (e.g. smoking, alcohol drinking, diabetes, hypertension, anxiety and depression).

Disclaimer: This publication is not intended as a replacement of regular medical education. The reviews are a summarized interpretation of the published studies and reflect the opinions of the writer rather than those of the research group or the scientific journal. It is suggested that the reader reviews the full trial data before forming a final conclusion on its merits.

Sleep, wellbeing, and cognition in medical interns

Reference: Massar, *et al.* Sleep, Well-Being, and Cognition in Medical Interns on a Float or Overnight Call Schedule. *JAMA Netw Open.* 2024;7(10):e2438350.
<https://doi.org/10.1001/jamanetworkopen.2024.38350>

The demanding nature of medical training, with long hours and irregular shifts, can lead to sleep deprivation and burnout. On-call shifts of 24+ hours require overnight care, exacerbating these issues. A study by the Centre for Sleep and Cognition at National University of Singapore (NUS Medicine), and the National University Health System (NUHS), shows that alternative schedules like the float system, where several shorter night shifts are concentrated in single week, significantly improve sleep, wellbeing, and performance.

The study followed 96 first year physicians' (interns) over two months, monitoring sleep patterns, wellbeing, and cognitive performance through wearable sleep trackers, electronic diaries, and smartphone apps.

Results showed that interns who worked on an on-call schedule had poorer quality and more irregular sleep than those working on a float schedule. Specifically, 24-hour on-call shifts negatively impacted mood, motivation, and sleepiness, leading to reduced attentional performance. Night shifts on a float system did not result in similar detriments. On both schedules attentional detriments were partly countered when interns had a chance to nap during the night shift.

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CALENDAR

10-12 APR

Sleep and Breathing 2025

The 8th conference organised by the ERS and ESRS

Antwerp, Belgium, <https://esrs.eu/sleep-and-breathing-conference/>

16-18 MAY

2025 AADSM Annual Meeting

Annual Meeting of the American Association of Dental Sleep Medicine

Las Vegas, NV, USA, https://www.aadsm.org/aadsm_annual_meeting.php

8-11 JUN

Sleep 2025

The 39th annual meeting of the Associated Professional Sleep Societies, LLC (APSS)

Seattle, WA, USA, <https://www.sleepmeeting.org>

**SAVE THE
DATE**

Singapore 2025
WORLD SLEEP
September 5-10

Singapore Sleep Society

Membership Application and Fees

Ordinary members

\$30/year – sleep professionals with a medical degree, PhD or equivalent.

Associate members:

\$10/year – any person involved in the field of sleep disorders without the above qualification.

Supporting members:

Corporations and individuals supporting the society financially.

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