

# Sleep matters

ASEAN SLEEP MEDICINE NEWSLETTER NEWS / OPINIONS / INSIGHTS



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Dreammapper improves adherence by 20%.

## Interview with Dr. Mark Aloia on “Novel methods to improve PAP adherence– Dreammapper”

### **a. How do we define adherence to PAP therapy in US? Are there any limitations of this definition? Do you have any suggestions on alternate definitions?**

Adherence, in general, can be defined in a number of ways. As a scientist, I look at it many ways, depending on the question I am asking. For example, you can dichotomize it as adherent or not adherent, which frankly does not give you a full picture of adherence as a behavior, but can be practical. You can look at the variability of it. You can look at patterns over time. In the US, the most common definition is one applied by Medicare and other payers that dichotomizes it for practical purposes. The formal definition is at least 4 hours a night use, 70% of the nights, over 30 consecutive nights in the first 90 days of use. Yes, it sounds like an odd definition, because it is. What is even worse is that the payers are not reimbursing for PAP therapy unless this definition is met. There are two primary problems with this. First, patients with use lower than this may still benefit from keeping therapy. Our lab has published papers that demonstrates that use

even lower than this confers cognitive benefits and that patterns can absolutely change after 90 days. Second, it runs on the premise that the threat of losing the device will change behavior, which is typically not how behavior change occurs.

### **b. How do patients and care providers monitor adherence and effectiveness of CPAP therapy today?**

Those are two separate questions. Adherence is typically monitored by microchips housed within the devices themselves that monitor use whenever it occurs and can tell whether or not a patient even has the mask properly affixed to the face. This is very sophisticated monitoring and was one of the first “wearable” devices with this type of monitoring. Effectiveness is different and there is no systematic way to measure the effectiveness of PAP therapy. It is typically handled the way that most medical therapies are handled, with a conversation between the patient and the treating clinician.

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### c. What factors influence patient adherence to CPAP therapy?

There are many. Most people believe that barriers typically interfere with adherence (e.g., noise, size, discomfort, etc.). This may be the case in any given case, but, over the past few decades, we have virtually eliminated some of these barriers and poor adherence still exists. I think the real answer is that behavior, the value we place on health, and psychology affects adherence. Most specifically, the literature tells us that someone must feel that the treatment is important to use and they must feel confident that they can achieve their usage goals in order to be adherent. Confidence is probably the most important factor. Our goal is to enhance a sense of urgency to use, but more importantly, to instill confidence is using PAP therapy.

### d. What is Dreammapper?

Dreammapper is a mobile app and website that provides patients with support to give them the confidence they need to be successful with PAP therapy. It provides them feedback on their usage, mask fit and residual AHI (a measure of machine effectiveness). It allows them to set reachable goals with the help of sophisticated algorithms that will ensure that goals are met to instill confidence. It provides education and troubleshooting to enhance self-management of OSA, again, instilling confidence. And, it uses psychology to engage and elicit the critical thought in patients that is needed for them to tap into their own motivation for success.

### e. How is Dreammapper different from other similar applications?

The primary way in which it is different is that it is based on psychological principles used in therapy to enhance adherence to treatment. Much of it is based on my own work, which I've been conducting for about 2 decades now. The goal is to create a digital therapeutic relationship with the user to maximize outcomes. It is also different in that it seems to have much better outcomes compared to other programs.

### f. Does use of dreammapper by patients improve adherence to PAP therapy as compared to patients who do not use it?

Absolutely. We have now seen in one randomized clinical trial, and across several observational studies using existing data, that just providing patients with this tool improves adherence by about 20%. Typically, adherence to the US standards that I described earlier is about 55%. In our latest evaluation of over 172,000 patients, just having DreamMapper resulted in adherence of 78%! This is truly remarkable.

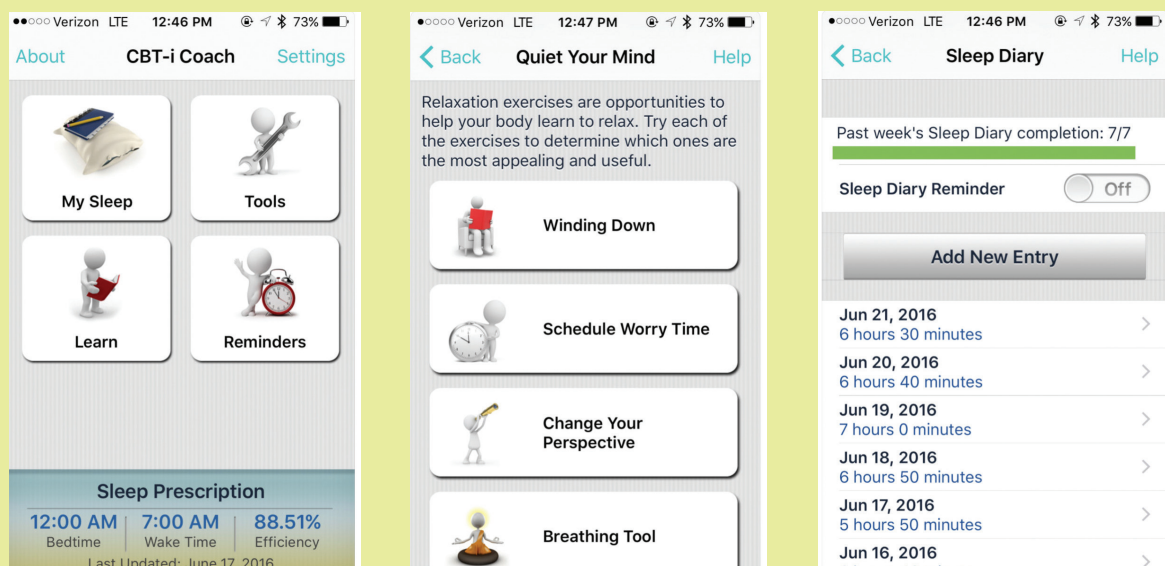
### g. How often should the care providers review the patient PAP data for adherence and effectiveness?

This is really up to the care provider. There is no evidence that continuous review is necessary, but I'm sure it could lead to some very interesting conversations, especially if the patient is struggling. DreamMapper is designed to work on its own and many patients will initiate the conversations when they need to, regardless of whether or not the physician has opened that door to them. I would refer to it whenever I see a patient, but that's just my approach.

## Sleep and Phone App's

Phone app "CBT-I Coach" can be used to provide cognitive behavioral therapy to Insomnia patients. The study included 18 patients.

Koffel E<sup>1</sup>, Kuhn E<sup>2</sup>, Petsoulis N et al. A randomized controlled pilot study of CBT-I Coach: Feasibility, acceptability, and potential impact of a mobile phone application for patients in cognitive behavioral therapy for insomnia. *Health Informatics J.* 2018 Mar;24(1):3-13





DR. TEOFILO L. LEE-CHIONG JR.

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Telemonitoring with automated feedback massaging improves  
90-day adherence to CPAP therapy in OSA patients.

## Dr. Teofilo's summary of Clinical Studies on “Emerging role of telemedicine in the sleep center”

### 1. Telemedicine is well accepted by patients.

In a prospective observational study, 160 patients with OSA completed a questionnaire on attitudes regarding TM one month after they were started on CPAP therapy. In addition, adherence and use of TM were assessed at 10 months of therapy. Although 78% of patients found TM favorable, 40% felt that this was intrusive. Seventy-eight percent of patients remained on TM at 10 months. However, there was no significant difference in mean duration of CPAP use between the TM and non-TM groups.

Acceptance of telemonitoring among patients with OSA: How is the perceived interest by and for patients? Bros JS et al. Telemed J E Health. 2017 Oct 13.

### 2. Telemonitoring with automated feedback massaging improves 90-day adherence to CPAP therapy in OSA patients.

The investigators conducted a study to answer the question – does education and/or automated feedback messaging delivered by TM influence CPAP adherence? This RCT enrolled 1,455 patients, of whom 956 had HSAT and 556 were given CPAP treatment. Patients were randomly assigned to 4 groups, namely (a) usual care, (b) web-based education, (c) TM with automated patient feedback, or (d) both interventions. CPAP use was significantly higher in the two groups that added TM with automated patient feedback compared to the usual care group, but not to the web-based education group. Clinic attendance was higher in the TM groups (68.5% vs. 62.7%;  $p=0.02$ ).

Table 1: CPAP therapy adherence rates

	Usual care	Web-based education	TM with automated patient feedback	Both interventions
Average daily CPAP use at 90 days (hours)	3.8 ± 2.5	4.0 ± 2.4	4.4 ± 2.2	4.8 ± 2.3
Medicare adherence rates	53.5%	61.0%	65.6%	73.2%

Effect of telemedicine education and telemonitoring on CPAP adherence: The Tele-OSA Randomized Trial. Hwang D et al. Am J Respir Crit Care Med. 2017 Aug 31.

### 3. Telemedicine is more cost-effective than standard follow-up care for CPAP treatment.

This study included 100 patients with newly diagnosed OSA [AHI > 15]. They were randomly assigned to standard management or TM, which consisted of daily reports on compliance, air leaks and residual respiratory events. Additionally, TM was used to initiate patient contact to resolve issues. Participants were assessed at baseline and after 3 months. TM was less expensive compared to traditional management ( $p=0.022$ ) and was cost-effective (ICER EUR17358.65 per QALY gained). No

significant differences in CPAP compliance, symptoms, QOL and adverse effects were observed between the two groups. However, more patients reported high/very high satisfaction ratings with traditional follow-up compared to TM (96% vs. 74%;  $p=0.034$ ).

Management of CPAP treatment compliance using telemonitoring in OSA. Turino C et al. Eur Respir J. 2017 Feb 8;49(2).

### 4. Telemedicine is useful in tracking CPAP treatment-emergent central sleep apnea.

Data gathered via TM was used to assess when CSA develops during CPAP treatment of OSA at 1 (baseline) and 13 weeks. Patients were classified into 4 groups, namely OSA (CAI < 5 in both weeks 1 and 13), persistent CSA, transient CSA, or emergent CSA. Central sleep apnea was present in 3.5% of patients in week 1 or 13. Treatment emergent CSA was associated with older age, higher residual AHI and CAI at week 13, greater leaks, and lower adherence to therapy.

Table 2: Classification of central sleep apnea

	Definition	Percent
Persistent CSA	CAI ≥ 5 in both weeks 1 and 13	25.2%
Transient CSA	CAI ≥ 5 in week 1 but < 5 in week 13	55.1%
Emergent CSA	CAI < 5 in week 1 but ≥ 5 in week 13	19.7%

Trajectories of emergent CSA During CPAP therapy. Liu D et al. Chest. 2017 Oct;152(4):751-760.

### 5. Telemedicine can be used to provide education in sleep medicine to primary care providers.

Thirty-nine primary health providers, including nurse practitioners, registered nurses and physicians participated in this study. One-third of the participants worked in rural healthcare. The program consisted of up to 10 stand-alone, 1-hour sessions of video-teleconferencing that combined didactics with individualized clinical case review. Forty-four percent completed the program evaluation, and 93% of respondents expected that their practice would change, including greater comfort in managing sleep-related complaints. Conflicts with scheduling and lack of protected time were cited as major barriers to participation.

Development of a sleep telementorship program for rural department of Veterans Affairs primary care providers: Sleep Veterans Affairs Extension for Community Healthcare Outcomes. Parsons EC et al. Ann Am Thorac Soc. 2017 Feb;14(2):267-274.

#### Abbreviations:

AHI: apnea hypopnea index; CAI: central apnea index; CPAP: continuous positive airway pressure; CSA: central sleep apnea; HSAT: home sleep apnea testing; ICER: incremental cost-effectiveness ratio; OSA: obstructive sleep apnea; QALY: quality-adjusted life-year; QOL: quality of life; RCT: randomized clinical trial; TM: telemedicine/monitoring



# Events in the region and world

Sep - Dec 2018

ERS International Congress Paris, France  
<https://www.ersnet.org/congress-and-events/ers-international-congress>

**15 - 19 Sep 2018**

Sleep Medicine Essentials,  
Rosemont Illinois, US  
<https://my.aasm.org/s/lt-event?id=a1U41000002MTezEAG>

**20 - 23 Sep 2018**

National Sleep Technology Course  
Goa, India  
[www.issr.in](http://www.issr.in)

**21 Sep 2018**

National Sleep Medicine Course  
Goa, India  
[www.issr.in](http://www.issr.in)

**22 - 23 Sep 2018**

ESRS Basel, Switzerland  
<http://www.esrs.eu/conferences-events/esrs-congresses-events.html>

**25 - 28 Sep 2018**

Chest 2018 San Antonio, Texas  
<http://www.chestnet.org/Education/CHEST-Meetings/CHEST-Meetings>

**6 - 10 Oct 2018**

South East Asian Academy of Sleep Medicine (SEAASM) Annual conference Lucknow, India  
<http://www.seaasm.org/4th-conference-icsd-2018.php>

**12 - 14 Oct 2018**

Sleep Downunder  
Brisbane, Australia  
<https://www.sleep.org.au/conferences/future-events>

**18 - 20 Oct 2018**

Practice Management Course:  
Optimizing Sleep Facility Operations,  
Rosemont Illinois, US  
<https://my.aasm.org/s/lt-event?id=a1U41000002MTkDEAW>

**26 - 27 Oct 2018**

KIRS, "Sleep Apnea- How to Care the Patient",  
Seoul Korea

**10 - 11 Nov 2018**

23rd Congress of APSR  
Taipei, Taiwan  
<http://www.apsresp.org/congress/2018.html>

**29 Nov - 2 Dec 2018**

## Sleep matters past issues

To access the past issues of sleep matters, please go to the below webpage  
[www.philips.com.sg/healthcare-consumer/sleep-apnea/resources#sleep-physicians-newsletters](http://www.philips.com.sg/healthcare-consumer/sleep-apnea/resources#sleep-physicians-newsletters)

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## Letters to the Editor:

Our readers are invited to write to the editor by volunteering content that they feel strongly about or feel needs coverage in a publication such as this. Your input is welcome and valued, particularly with case studies and hot topics currently debated in the field, as well as reviews of Asia Pacific congresses and conferences that you might like to share with the audience. Your letters will be featured in future issues of Sleepmatters, allowing an open forum between experts and increasing the level of engagement amongst the audience.

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