

PHILIPS

Innovation

SmartSleep



Helping tired people get the sleep they need

The world's first clinically proven wearable solution to improve deep sleep quality for those who do not get enough sleep due to lifestyle

Need

Nearly 40% of people aged 25–54 get less than the recommended seven hours of sleep per night, which is reported to result in difficult concentration, memory and focus.¹

Solution

SmartSleep is a wearable solution, comprising a smart headband and app. It is clinically proven to help improve the quality of sleep for people who do not get enough sleep because of lifestyle demands. The headband contains proprietary sleep analysis algorithms, developed in collaboration with leading sleep experts and neurologists, which enhance the slow waves produced by the brain during the most rejuvenating stage of sleep.

Benefits

- Clinically proven to:
 - Increase energy
 - Boost alertness
 - Improve the quality of sleep²
- Drug free and non-habit forming
- User can wear it at home and track progress via mobile app
- Connecting users to their data encourages user engagement³

Not getting enough sleep can affect how our brain functions during waking hours. Slow wave activity (SWA) during sleep has beneficial effects on the restoration of brain function during the day by improving alertness and memory consolidation.⁴

Based on research that auditory stimulation significantly enhances SWA,⁵ Philips developed SmartSleep. Unlike other sleep trackers that merely monitor a user's sleep pattern, this closed-loop, EEG-based system is uniquely designed with two small sensors that detect periods of slow wave sleep and intervene with clinically proven customized audio tones to boost it in real time. Users can access data from the headband via an app that tracks sleep patterns over time and measures the slow wave boosts delivered overnight.

70%
of users reported feeling
less tired during the day²

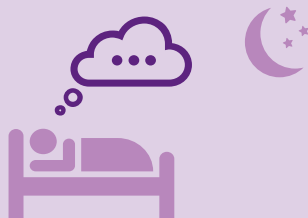




Nearly **40% of people aged 25-54** get less than the recommended seven hours of sleep per night¹



An **increase** in slow wave sleep (SWS) after learning relates to improved performance after sleep⁴



Slow waves are key sleep waves that are critical to restorative, quality sleep

Today's lifestyle demands mean that many adults are getting less than the recommended seven to nine hours of sleep per night, restricting the time available for the body to achieve the third and most rejuvenating stage of deep sleep, called slow wave sleep.

Studies show that people who sleep less than seven hours per night have greater difficulty concentrating, remembering, and driving than those who sleep more than seven hours.⁶ Recurrent sleep deprivation can have a cumulative effect on mental and physical wellbeing and can exacerbate chronic diseases⁶ and increase the risk of hypertension, diabetes, obesity, depression, heart attack, and stroke⁷.

A decade of data

SmartSleep builds on Philips' leadership in sleep therapy and more than 2.6 billion nights of sleep data⁸ collected by the company over the last 10 years.

A randomized double-blind study involving the SmartSleep device was conducted at four different clinical sites in the US. The subjects of the study were chronically and mildly sleep-restricted people who followed a regular sleep-wake schedule and used the device primarily at home for a period of two weeks, with a week of washout in between. They were randomly assigned to use the SmartSleep for week one, followed by a second week with a SmartSleep that tracked sleep but did not provide auditory stimulation (or vice-versa).

The study showed that subjects had an average SWA increase of 6.8% when stimulated by SmartSleep. It also showed that the headband's auditory stimulation did not disturb sleep and may even help in maintaining sleep continuity.⁴

Personalized care

SmartSleep's proprietary algorithms produce audio tones that are customized to each individual user in real time, in order to enhance the depth and duration of slow wave sleep.

The SmartSleep app enables users to track their total sleep hours, number of sleep boosts delivered, and how much time their sleep is boosted. The app also provides tips and advice on how to get the best possible night's sleep. Connectivity is disabled when the device is being worn, so users can choose when to sync to their device.

SmartSleep is the latest addition to Philips' growing portfolio of smart digital platforms and intelligent solutions that connect people, technology and data to motivate users into making simple changes to their daily routine that can have a big impact on their long-term health.

SmartSleep builds on more than **2.6 billion nights of sleep data**⁸



1. Centers for Disease Control and Prevention, 2011. Data analysis from the 2005–2008 National Health and Nutrition Examination Survey (NHANES) – cross-sectional design. Stratified, multistage probability sample of the civilian noninstitutionalized U.S. population. N= 10,896. 74.8% response rate.
2. When used for two weeks in people who do not get enough sleep due to lifestyle, as reported by users.
3. What SmartSleep doesn't do: Help users fall asleep, stay asleep or prolong sleep; serve as an alarm clock; help with existing sleep conditions such as insomnia, restless legs or sleep apnea.
4. Garcia-Molina G, Mahadevan A. Slow Waves in the Sleeping Brain [Philips Research North America, University of Wisconsin-Madison, and Sleep and Respiratory Care, Philips Healthcare].
5. Mahadevan A, Molina G. SmartSleep: quantifying slow wave activity enhancement. Sleep and Respiratory Care, Philips Healthcare; Monroeville, PA, United States.
6. Centers for Disease Control and Prevention. "Effect of Short Sleep on Daily Activities – United States, 2005–2008." Morbidity and Mortality Weekly Report, vol. 60, no. 8, pp. 239–242, 2011.
7. Institute of Medicine (US) Committee on Sleep Medicine and Research. "Sleep Disorders and Sleep Deprivation: An Unmet Public Health Problem." Washington DC: National Academies Press, 2006.
8. Based on snapshot data from Philips Encore Anywhere database. Total nights of sleep therapy data stored within Encore Anywhere for US companies = 2,684,989,255 as of December 2017. (1 patient for 1 night where usage was greater than 0 from the period of 1/1/2007 through 12/3/2017 = 1 night of data).

Learn more

www.philips.com/smartsleep

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SmartSleep is for adults who do not get enough sleep due to lifestyle. It is not for people with sleep disorders, such as insomnia or sleep apnea. Not recommended for people over 50 or with hearing impairment unable to hear 80 dBs.