



WELLBEING
THE SCIENCE
OF SLEEP



WITH RECENT SCIENTIFIC BREAKTHROUGHS, PIONEERING TECHNOLOGICAL ADVANCES AND THE TRENDING #SLEEPREVOLUTION, MIGHT WE FINALLY HAVE THE ANSWER TO THAT AGE-OLD QUESTION: WHY DO WE SLEEP?

“our minds need a regular reboot in order for our brains to remember and learn”

Previous page, left: Synapses firing in the human brain.

Previous page, right: Data capturing during a sleep cycle.

This page, left: The Sleep Revolution by Arianna Huffington (WH Allen, £16.99).

Opposite page: A documented sleep cycle from the Dreem app by Rythm.

Following page, top to bottom: Dreem, a sleep wearable that analyses sleep in real time, improving its quality with the data; the data syncs to your mobile phone; the wearable headset allows for accurate sleep analysis.

“It is a common experience that a problem difficult at night is resolved in the morning after the committee of sleep has worked on it,” said John Steinbeck. It seems an obvious lesson, and one that is ingrained into our language. *Sleep on it*, we urge the indecisive – and yet, most of us would be hard-pressed to know why entering a state of unconsciousness helps so much with our waking lives.

There are several schools of thought when it comes to the purpose of sleep. The repair and restoration theory posits that sleep is vital for revitalising both physiological and mental functions, and removing waste toxins from the brain. Whereas the evolutionary theory – also known as the adaptive theory – suggests that sleep evolved as a means of conserving energy during the most potentially hazardous hours. Another is the synaptic homeostasis hypothesis, which states that sleep is necessary for the brain to wind down, consolidate memories and prepare for the next day. Indeed, the most recent research unveiled at the University of Freiburg in August seems to support this model. For the first time, scientists were able to show that sleep resets the build-up of connectivity that takes place during waking hours in the human brain. In essence, our minds need a regular reboot in order for our brains to remember and learn.

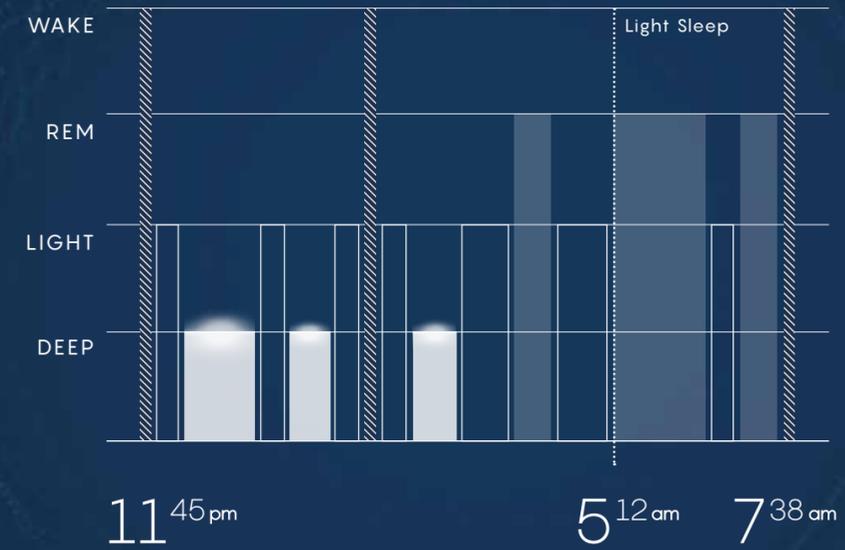
Arianna Huffington, the co-founder and former editor-in-chief of *The Huffington Post*, is currently spearheading The Sleep Revolution through her bestselling books, US college tour and social media campaign. In August, the media mogul left her eponymous news website to focus on her corporate wellness service, Thrive, which will launch officially on 30th November. Upon her departure, Huffington told staff that she had “become more and more passionate – okay, obsessed – with burnout and stress and how we can reduce their impact on our lives”.

In her latest book, *The Sleep Revolution: Transforming Your Life, One Night at a Time*, Huffington writes: “Death from overwork has its own word in Japanese (karoshi), in Chinese (guolaosi), and in Korean (gwarosa). No such word exists in English, but the casualties are all around us. [...] Sleep deprivation has become an epidemic.”

When Huffington gave her now-viral TED Talk on sleep, she discussed how sleep deprivation one-upmanship has flourished in our modern business world. “For men, sleep deprivation has become a virility symbol,” she noted. Not only is this damaging to personal health, but it’s a dangerous situation for the world’s leading companies and institutions to be in.

So how to tackle this global sleep crisis? Perhaps it should come as little surprise, but there’s an app for that. More specifically, Rythm, a San Francisco-based neurotechnology company has debuted the world’s first active wearable to improve sleep quality. Designed to be worn while sleeping, Dreem is a headband that uses sound synchronised to your sleep cycles to improve the quality of your shut-eye.

To understand how this works, it’s important to realise that sleep is an active state. A single night’s sleep consists of multiple sleep cycles, with each cycle following a well-orchestrated sequence. Light sleep, then deep sleep, leading to REM (rapid eye movement), which is when most dreams occur. »



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‘For men, sleep deprivation has become a virility symbol’”*

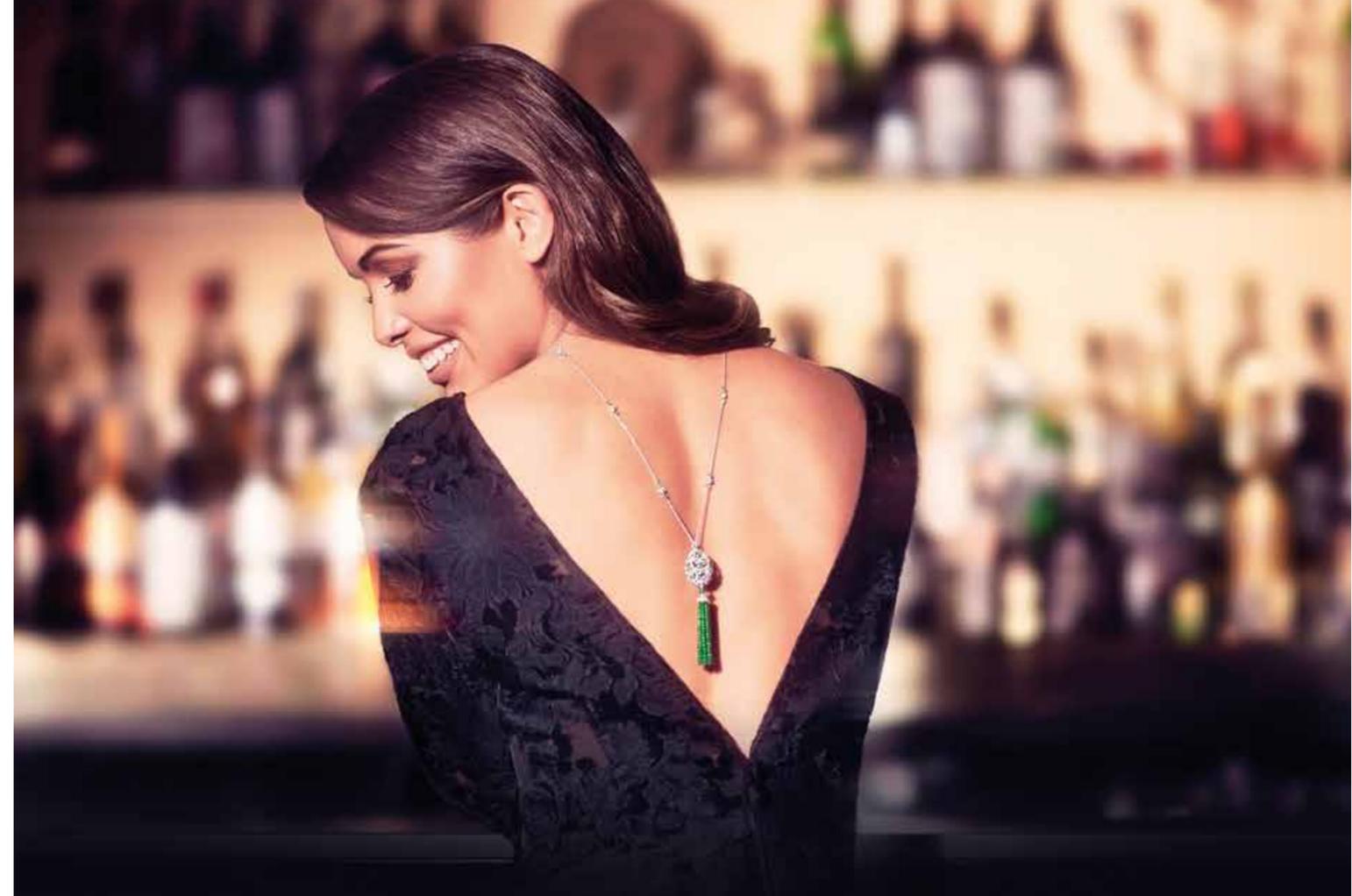
Using bone conduction technology that transmits sound without earplugs, the audio stimulation supplied by Dreem has been proven to help the brain stay in deep sleep. Characterised by slow oscillations, deep sleep is crucial for brain energy restoration, memory consolidation, hormone balance, and delaying degeneration.

If you’re wondering how noise – not usually associated with a good night’s sleep – can aid in prolonging deep sleep, it might help to picture a swing. In the context of brain activity patterns, the slow oscillations observed during deep sleep are like a swing on a windy day. The audio stimulation acts as the repeated pushes to help the swing oscillate. While random sounds during the night are a disturbance, this type of audio stimulation activates neurons mainly in the temporal lobes. This in turn modifies their excitability and increases the chances of a slow wave propagating through the brain.

Users can view their sleep brainwaves via the accompanying iOS app, and more importantly, track sleep history over time. In addition, Dreem also boasts “the world’s best alarm clock”. Even better than your mother’s Teasmade, Dreem allows users to choose their desired waking time, and then wakes them at their optimal sleep stage closest to that time. That way, users bypass the grogginess that comes from being jarred awake during an unsuitable stage of the sleep cycle.

Speaking about the technology, Rythm CEO and co-founder Hugo Mercier explains: “The future belongs to those who can apply and learn from the human brain. It is one of the most intricate systems on the planet and yet we are only beginning to understand how it functions on a deeper level – but as we learn more, we’ll unlock new possibilities and products that can help us tackle some of the biggest problems we have today.”

And we all know one of the best ways of tackling a problem: Go to sleep. [w](#)



*‘The most enduring legacies
are born of the most colourful lives’*



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