



EYES WIDE SHUT

At a recent symposium on sleep at the Wellcome Institute in London, a collective "Ahhhh" went round the hall when a picture of a bedraggled-looking dog on a lead was flashed on the screen. The lecturer explained that it was called Tunis and that it featured in a landmark experiment in the study of sleep just over 100 years ago. Our rapt attention turned to something close to disgust, however, when we learned what the experiment involved.

The lead around the unfortunate animal's neck was looped over a hook so that he could stand but not sit or lie down. This meant that he was unable to go to sleep. The scientist then watched and waited to see what would happen.

Tunis lasted nine days before he died. Not only did that show that sleep deprivation could kill but it raised the exciting possibility of discovering a cure for insomnia. The researchers crushed up Tunis's brain and injected extracts from it into other dogs to see if they would be put to sleep by the chemicals the fluid contained.

Although the sufferings of Tunis, along with those of the other unfortunate dogs, did not produce the chemical elixir for sleep, the study, as Professor Kenton Kroker of York University in Toronto explained, did mark a change in the way people thought about sleep. Until then probing its mysteries had been the province of psychologists, with researchers reporting on

From power-nap sleep pods to cognitive behavioural therapy, scientists continue to seek ways of reclaiming the night's lost hours, says Jerome Burne. Illustration by David Humphries.

their own sensations and thoughts as they drifted off or woke up. By comparison, the physiological approach – measuring chemicals and behaviour – is far more rigorous.

In the century since then physiological investigations have told us a vast amount about the biology of sleep. Researchers have identified many of the chemicals involved, the genes that control it and how activity in different areas of the brain changes through the night as we cycle in and out of the different stages of sleep. The shift from a subjective to a scientific understanding of sleep had an important social consequence. Sleep became part of the material world rather than a private inner process, and as such a resource to be exploited.

We tend to think of our own age as being particularly hostile to sleep with the 24/7 demands of a global economy, but people were thinking about ways to make more profitable use of those unconscious hours "wasted" in bed back in the 1920s. Another slide at the symposium showed the cover of a sci-fi magazine depicting a newspaper editor wearing the Sleep Eliminator, a device that consisted of a large magnetic

coil encircling his body and an extra oxygen supply. Although the Sleep Eliminator never made it into production, during the rest of the 20th century precious hours were prized from sleep's grip, reducing the average night's sleep from about nine hours in 1910 to seven-and-a-half hours in 1975 and to below seven hours by 2000.

The result is that many of us are simply not getting enough sleep, which doesn't just make us feel bad; it can have profound effects on our health. The damaging effects of sleep deprivation kick in quite quickly. In one study, volunteers who were kept awake until three in the morning for just a couple of nights showed a drop in levels of various immune hormones, making them more vulnerable to infections. Our rising sleep debt could even be contributing to the current epidemic of obesity and diabetes. When Dr Yue Van Cauter of the University of Chicago

restricted the sleep of a group of healthy young men to only four hours a night for two nights, their blood-sugar levels started showing a pattern linked with weight gain and the early stages of diabetes.

However, there are signs that the tide may be turning. There's a feeling that we have gone as far as we can stealing time from sleep. Because it's not just work that's encroaching into sleep's territory; even when people do get to bed, increasingly they can't sleep, with sales of over-the-counter sleep aids increasing 18 per cent in the UK last year.

So it's not surprising that specialised sleep facilities are moving into offices and gyms, where the latest gizmo is the EnergyPod. Ergonomically designed for the perfect power nap, the pod has a visor to block out light and sound, plus a music memory card so that the user can programme in their favourite numbers to help them get to sleep. After 20 minutes (or however long the timer is set for), the reclining chair vibrates and lights come on to wake you. Designed by researchers at Carnegie Mellon University in 2001, the EnergyPod forms the central part of a package

from a firm called Metronaps, which claims that one pod at a cost of £299 a month is enough to refresh 30 employees.

Although there have been no studies specifically on the results of using the EnergyPod, there is no shortage of research to back the benefits of power naps. Studies on airline pilots, for instance, found that when pilots took a 20-minute nap during long-haul flights they were 100 per cent more alert afterwards and more efficient during landing. "A short sleep allows the brain to recharge without confusing the body clock," says Professor Jim Horne of the Sleep Research Centre at Loughborough University, who has run studies on power napping – although he's not convinced you need tens of thousands of pounds' worth of equipment to do it. But already the pods are being used by cutting-edge corporate nappers at companies in the US and Europe, including Procter & Gamble, Google, Cisco and PriceWaterhouseCoopers.

The pods may be a convenient way of catching up if a heavy schedule means that you've built up an uncomfortable sleep debt, but if you are one of those people who regularly finds themselves staring at the ceiling at three in the morning, you need more structured help.

One place to start that may not be immediately familiar is your diet. Biochemical pathways involved in sleep can be directly affected by specific foods as well as sleeping pills and discussing this with a clinical nutritionist might well be helpful. For instance, you'll almost certainly have raised levels of the stress hormone cortisol. Along with keeping you aroused at

night, this also has the effect of lowering production of the growth hormone needed for cell repair. To bring cortisol down you need to keep a stable blood-sugar level, which means avoiding sugar and other refined carbohydrates.

Being chronically stressed or eating a lot of sugar also lowers your magnesium level which, together with calcium, is involved in calming you down and relaxing your muscles. Magnesium is found in seeds, nuts, green vegetables and seafood, in calcium in milk and other dairy products, green vegetables and molasses. You could supplement your diet with 500mg of calcium and 250mg of magnesium 45 minutes before

four-day package including the above costs about £1,325 based on double occupancy.

For those wanting personalised professional treatment in the UK, the Sleep Centre has clinics in London and Edinburgh. They have various devices about the size of a wristwatch that you wear at home for a night or two to record things that may be causing a problem, such as your activity level, the room temperature and the light levels at the time you go to bed; they can also discover if you've got a breathing disorder that can interfere with sleep. This treatment, including consultations, costs £695.

If you need a more detailed check, monitors during an overnight stay at a private

treatment, including an overnight stay at a private hospital, is around £1,500.

Idzikowski goes on to explain that we can't change what triggered the problem, but we can do something about the behaviour and thoughts that are perpetuating it with the help of cognitive behavioural therapy (CBT). CBT helps sufferers amend the exaggerated thoughts that trigger anxiety through identifying and changing such unhelpful thoughts and behaviour. For instance, one common thought among insomniacs that gets worse the longer they stay awake is: "I'll never be able to do what I've got to do tomorrow if I don't sleep now." However, typically people underestimate their sleeping time, so it often doesn't impact as much on their performance as they fear. Getting them to accept that can improve sleep. We can change behavioural patterns, too; for instance, if you are not asleep in 20 minutes, get up and do something else. Then go back and try again.

The internet is a good source of CBT practitioners – and the bonus is that you are bound to pick up some useful tips for handling problems in your waking hours, too. ♣

"Children have to learn to sleep through the night. For some reason, as adults, insomniacs have lost the knack."

bedtime. The B vitamins, particularly B5, B6 and B12, are also involved in handling stress, but they are best taken earlier in the day as they can be energising. The best food sources of B vitamins are liver, tuna, brewer's yeast, wheatgerm, walnuts, peanuts, bananas, sunflower and molasses.

The nutritional approach is a key part of the package available to poor sleepers at one of the top spas in the US – Canyon Ranch in Arizona. No longer are you left to toss and turn alone in your room. Instead you can retire to the sleep lab, where you're hooked up to equipment that reads your brainwaves and other physical rhythms. Next morning a nutritionist, together with a behavioural therapist and exercise physiologist, formulates a personal sleep programme. A

hospital near the clinic can pick up more data on brain activity, breathing, muscle function, etc. "Insomnia is a learning disorder," explains Dr Chris Idzikowski, director of the Edinburgh clinic. "You are only really insomniac if there aren't any known reasons for you to sleep badly. So first we eliminate factors such as disease, blocked airways, a deregulated biological clock, or being anxious or depressed. All can cause poor sleep and all can be helped or cured but true insomnia is a learning problem. As children, we have to learn to sleep through the night and for some reason, as adults, insomniacs have lost the knack."

At the end of the Sleep Centre's check-up clients get a personal package of recommendations. The fee for the more detailed

SLEEPING PARTNERS

British Association for Behavioural and Cognitive Psychotherapies, www.babcp.com. **Canyon Ranch**, 8600 East Rockcliff Road, Tucson, Arizona 85750 (+1520-749 9000; www.canyonranch.com). **Clinical nutritionists**, see www.nutritionists.org. **Edinburgh Sleep Centre**, 13 Heriot Row, Edinburgh EH3 6HP (0131-524 9730; www.edinburghsleepcentre.com). **London Sleep Centre**, 137 Harley St, London W1 (020-7225 0523; www.london.sleepcentre.com). **Metronaps**, 0845-686 0033; <http://uk.metronaps.com>