

# Waking up to the importance of sleep

A growing chasm separates the growing scientific understanding of sleep, and the widespread public assumption that it just doesn't matter.

Is a full night's sleep an essential ingredient for a healthy mind and body, or just a luxury for the lazy? Despite extensive evidence for the former, the tendency of society (including hypercompetitive heads of laboratories) to applaud people who claim to be forever on the go leaves many assuming the latter. The notion that successful people can get by with just a few hours of sleep a night reinforces a common perception that sleep is a waste of time.

This misperception carries serious ramifications. The tendency to sleep less — perhaps 20% less in industrialized countries than a century ago — has serious consequences for public safety. In a poll funded by the US National Science Foundation (NSF), more than one-third of American drivers admit to having nodded off behind the wheel. Public disasters such as the 1989 *Exxon Valdez* oil-tanker accident have been attributable, in large part, to sleep deprivation. Furthermore, a mounting body of evidence links a lack of sleep to mood swings, depression, anxiety and other mental illness.

The medical profession has been slow to acknowledge all this. According to the same NSF poll ([www.sleepfoundation.org](http://www.sleepfoundation.org)), 75% of patients report sleep problems, but less than one-third say their doctor has asked them about it. And trainee physicians seem to be trained to wear their own sleep deprivation as a badge of honour, rather than what it is — a threat to health, safety and professionalism.

A *Nature* Insight on sleep in this issue (see page 1253) sheds some fascinating light on sleep research. It explores questions ranging from what we might learn about the function of sleep by studying the variation in sleep patterns between different mammals, to whether sleep is essential for some forms of memory consolidation.

Sleep is much more than an absence of activity in the body and brain. The brain is highly active during sleep, especially during REM sleep, which is characterized by rapid eye movements and vivid dreaming. Sleep is also far from the single phenomenon it is sometimes assumed to be: the brain activities behind its different stages can be as distinct from each other as they are from wakefulness.

Although answers to some of the most basic questions in sleep research — such as why we sleep at all — remain elusive, recent

developments do provide knowledge that is directly relevant to public health and safety. Despite the common perception that falling asleep is a gradual process, for example, the transition from being awake to being asleep can be extremely rapid.

On page 1257 of this issue, Harvard neuroscientist Clifford Saper and his colleagues describe how a 'flip-flop' switch in the part of the brain known as the hypothalamus brings about discrete transitions between waking and sleeping. They show how damage to this switching mechanism can lead to instabilities in both sleeping and waking states, as seen in narcolepsy, a debilitating neurological disease. The very concept of a switch that seems optimized to flip rapidly between being asleep and awake, without an intermediate state, should give pause to anyone tempted to drive or operate machinery when feeling drowsy.

Researchers should, however, be cautious about overplaying data that link sleep with illness. Both heart disease and obesity, for example, have been linked

to sleep problems in some studies. But despite clear signs of a correlation, evidence of a causal link remains inconclusive.

It would be naive to think that simply laying out the scientific facts will change popular perceptions about sleep and behaviour. Data proving the link between smoking and lung cancer, for example, were available long before behaviour changed on a significant scale. Even with the assistance of extensive public information campaigns, the message took a long time to sink in.

Nonetheless, basic neuroscience research has a role not just in building our understanding of sleep, but also in helping to convince the public to take it seriously. Public communication of important findings should be helped by the fact that so many people find the topic fascinating. Basic researchers, clinicians and educators can take advantage of this interest to make the case for changes in behaviour — while ensuring that they, too, get a good night's sleep. ■

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## Is the city safe?

The Environmental Protection Agency is ducking a frank assessment of New Orleans after Katrina.

After the terrorist attacks of 11 September 2001, the US Environmental Protection Agency (EPA) took some flak for declaring, perhaps prematurely, that the air was safe in the vicinity of the World Trade Center in New York.

Now the agency, which is charged with protecting public health

and the environment, is abdicating its responsibility to issue clear public guidance on possible health hazards in New Orleans, flooded last month by Hurricane Katrina. It is saying nothing on the advisability of returning to the ruined city, arguing instead that its job is just to run tests and pass on data to local officials, who will make of them what they will.

For what was once the world's foremost environmental agency, this simply isn't good enough. The EPA's own scientific advisory board, as well as the usual welter of environmental groups, are rightly calling on the agency to do its job properly, and give the American people more solid information about the environmental