

Disturbed sleepers at risk of diabetes

Finding may help design strategies to prevent, cope with the disease

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SUCCESSIVE NIGHTS of disturbed sleep appear to put people at greater risk of developing type 2 diabetes, according to research in which scientists interfered with volunteers' sleep patterns.

The research is the first to show that disturbed sleep can affect the production of insulin, and consequently a person's ability to metabolise glucose. It could have huge implications for understanding and tackling the diabetes epidemic that is predicted to grip western countries due to increasingly obese populations.

Between 85 per cent and 95 per cent of diabetes cases are type 2, which typically develops later in life and is

linked to obesity.

Eve Van Cauter, a professor at the University of Chicago, and colleagues studied five healthy men and four healthy women aged between 20 and 31. The volunteers received two consecutive nights of undisturbed sleep and three nights during which they were prevented from entering the most restorative stages three and four of slow-wave sleep — a time when you do not dream.

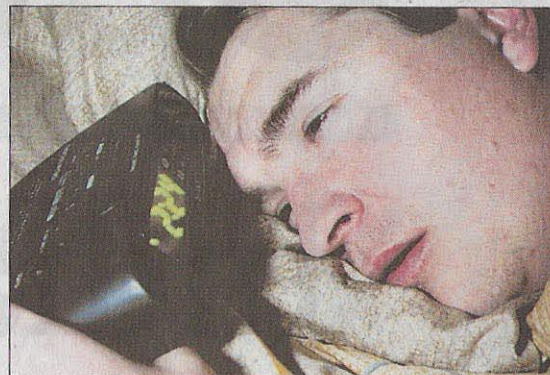
The scientists achieved this by monitoring the volunteers' brain waves and jolting them out of slow-wave sleep with recorded sounds that were not loud enough to actually interrupt sleep. On average, the volunteers needed 250 to 300 interventions a night.

After allowing the volunteers either normal or impaired sleep, the re-

searchers injected a standard amount of glucose into their bloodstreams and monitored how well they dealt with it.

The team reported in *Proceedings of the National Academy of Sciences* that after three nights of disturbed sleep the volunteers were significantly glucose-intolerant: they had, on average, 23 per cent more glucose in their blood. That is a decrease in insulin sensitivity comparable to that caused by gaining 9-13 kg in weight. Also, those with low baseline levels of slow-wave sleep had the lowest levels after having their sleep patterns disrupted; they also experienced the greatest decrease in insulin sensitivity.

"These findings demonstrate a clear role for slow-wave sleep in maintaining normal glucose control," said team member Esra Tasali. "A profound de-



The results of the first of its kind study show that obesity and a lack of quality sleep may interact to cause type-2 diabetes. Strategies to improve the quality and amount of sleep may help to prevent or delay the onset of the disease in populations that are at risk already.

crease in slow-wave sleep had an immediate and significant adverse effect on insulin sensitivity and glucose tolerance."

The results suggest obesity and a lack of quality sleep may interact to cause type 2 diabetes. "Since reduced amounts of deep sleep are typical of ageing and

of common obesity-related sleep disorders such as obstructive sleep apnoea, these results suggest that strategies to improve sleep quality, as well as quantity, may help to prevent or delay the onset of type 2 diabetes in populations at risk," said Van Cauter. **The Guardian**