Alertness CRC Media Release

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Body clock breakthrough for fatigued shift workers

Tired shift workers may soon have a smart tool that helps them manage fatigue, perform their best on the job and enjoy their down time more.

Australian researchers from the Alertness CRC have tested out a novel way to measure the body clocks of round-the-clock employees. The new model can be developed into a personalised real-time tool that improves sleep and health in this vulnerable workforce.

“Shift workers face huge challenges keeping their body clocks in sync with their sleep and work schedules,” explains lead researcher and Alertness CRC scientist Dr Julia Stone. “They are often at work when their body clock tells them to be asleep, and are trying to sleep during the day when their body clock tells them to be awake.”

The study found that with the aid of light and activity monitoring, mathematical modelling can effectively track a shift worker’s circadian timing. “This allows us to design personalised recommendations for managing their sleep and their alertness at work, or to alter their light exposure to bring the body clock back into alignment with their schedule,” Dr Stone explains.

The work, recently published in the international journal *Scientific Reports*, tracked circadian phase, light exposure and activity levels in 25 nursing and medical staff. Volunteers wore wrist activity monitors throughout a variety of day and night shifts, and rostered days off.

Dr Stone and her team tested for the first time whether an established mathematical model could use daily changes in light exposure and activity to accurately predict circadian timing in shift workers. “This was vital to test as there is currently no practical way of measuring circadian timing in real time,” she says. “This is particularly problematic when developing interventions for shift workers whose body clocks are often at odds with their work roster.”

Results show for the first time that the model can be generalised to estimate the timing of the body clock in shift-working staff. More than 80 per cent of body clock times were predicted within one hour on a day-active schedule, and 68 per cent on a night shift schedule, Dr Stone says.

“With some tinkering of the model to improve accuracy, this approach could be incorporated into a wrist-worn tool that can help predict when a shift worker will feel at their worst,” she says. “Employers can then build well-timed personalised interventions like light therapy, caffeine intake and naps into the shift. Managing on-
shift alertness in this way can ensure the workplace is both safer and more productive, and can improve the wellbeing of workers.”

This method is a simple and less costly alternative to measuring blood levels of the sleep hormone melatonin through expensive and time-consuming lab tests, the researchers say. “Being able to do this in real time right there in the office or on the factory floor is far more practical," Dr Stone says.

A recent report from the Parliamentary Inquiry into Sleep Health Awareness in Australia, “Bedtime Reading”, encourages the Alertness CRC, in collaboration with Safe Work Australia, to update optimal shift work guidelines to better promote alertness, productivity and worker safety.

“Our work is helping to drive best practice fatigue management solutions that will ultimately deliver safer workplaces through more alert and productive shift workers,” Alertness CRC CEO, Mr Anthony Williams, says. “Alert, productive employees are happier and healthier, both physically and mentally, so the benefits for our whole population are substantial.”

The study was led by Dr Stone in her role as researcher at Monash University. Collaborators also include Philips Research in the Netherlands, the Institute for Breathing and Sleep at Austin Health, and Brigham and Women’s Hospital and Harvard Medical School, both in Boston, USA.


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About the CRC for Alertness, Safety and Productivity
The Alertness CRC is an industry focused research program committed to maximising alertness in the workplace. The mission of the Alertness CRC is to 1) Promote the prevention and control of sleep loss and sleep disorders, and 2) Develop new tools and products for individuals and organisations to improve alertness, productivity and safety. http://www.alertnesscrc.com/

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