The CRC for Alertness, Safety and Productivity

Cooperative Research Centres Program
15th Selection Round (2012)

We have an unprecedented opportunity to:

- Begin a new era in alertness management and tackle the last major barrier to improved human performance
- Reduce the avoidable cost the sleepiness epidemic on the safety and productivity of Australian society
- Drive evidence-based change in behaviour, work practices, policy and legislation and the community response to our 24/7 society

The Cost of Impaired Alertness

- Over the next 7 years there will be **70,000** serious workplace injuries and **175,000** serious injuries from road crashes due to poor alertness
- The cost to the Australian economy is substantial:

  - Lost productivity and healthcare costs over $35B ($5B/yr)

  - Loss of healthy life over $215B ($31B/yr)

- The impacts of alertness failure are largely predictable and preventable
- We aim to reduce serious injuries by at least 9,000 per annum and reduce the related financial costs by $2 billion per annum within 15 years

Alertness failure is still happening Why?

- Current risk management strategies are over simplistic and out-dated
- Lack of accurate, reliable and easily-deployable alertness measurement and prediction tools
- Non-personalised treatment and intervention approaches – ‘one-size-fits-all’ does not work
- Under supported regulatory and policy frameworks to tackle sleepiness-related harm, including harm to others through ‘second-hand sleepiness’

Technology and Development End Users

Industry and Employment End Users

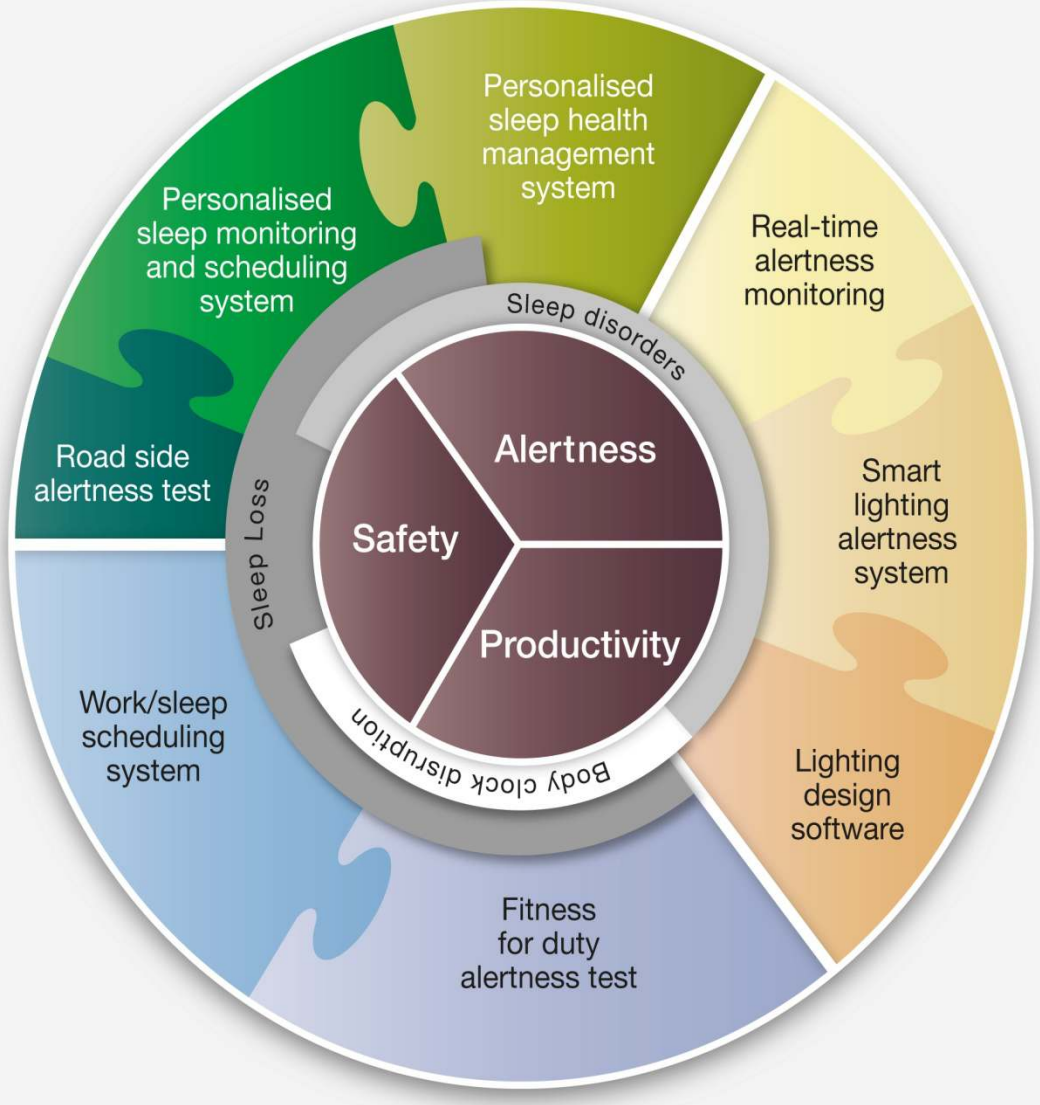
Policy, Regulatory and Insurance end Users

Research, Education and Training

Working Together

- Broad range of technology developers
- End users with high risk operational settings
- SME's seeking capacity and relevance in an international market
- Regulators that want to drive research and enable change
- Industry based training
- Commercialisation expertise and access to venture capital

The Solution



Maximising alertness at the individual, organisational and community levels with a comprehensive biological and personalised approach

Research Program One

ALERTNESS MEASUREMENT AND PREDICTION

1.1 Real-time biomarkers of alertness.

1.2 Technologies for detecting and predicting alertness.

1.3 Integrated platform for data management and analysis

Research Program Two

SAFETY AND PRODUCTIVITY IMPROVEMENTS

2.1 Dynamic scheduling systems

2.2 Smart lighting solutions

2.3 Personalised sleep health management

Key Deliverables

Comprehensive, Integrated, State-of-the-Art

Measurement and Prediction	Scheduling of Work and Sleep	Smart Lighting Solutions	Personalised Sleep Health
• Technologies and biomarkers of alertness impairment (biochemical, physiological) • Optimising and combining technologies and biomarkers for real-time portable alertness monitoring • Sophisticated mathematical modelling of sleep and wake to predict alertness	• Personalised sleep-wake monitoring / scheduling device that provides tailored information on wake and sleep promoting interventions (e.g. caffeine, light, melatonin) • Organisational rostering software based on state-of-the-art biological alertness models, task demands and operational factors	• Software for portable devices to deliver light alerting countermeasures, and 'smart' programmable LED lighting and systems • Light timing and use of different light colour strategies to adapt to shift work and jetlag • Software to facilitate customised lighting design	• Measuring individual vulnerability to sleepiness and targeted management of sleep disorders • Individualised sleep and alertness monitoring devices, scheduling software and 'Apps' • Customised lighting integrated with sleep, work and alertness assessment
• Integrated platform to deliver systems and tools • Education and advocacy to drive change			

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