

A New Methodology for Sleep Disorders Screening in Remote Areas

David Allen



Rhonda Russo



Requirements for Healthy Living



Excessive SLEEPINESS

- ▶ Attention deficiency
- ▶ Forgetfulness
- ▶ Irritability
- ▶ Decreased reaction time
- ▶ Decreased physical performance
- ▶ Sleep Debt
- ▶ Falling asleep at inappropriate places



The Costs of Fatigue...

- Sleep disorders, underlie **9.1%** of work related injuries and **7.6%** of non-work related motor vehicle accidents.
- Mining industry employs 2% of the Australian population
- Costs to industry at least \$100-200m / year
- Fatigue related incidents cost the Australian economy between \$2-4 billion a year



Cost of Sleep Disorders in Australia

- ▶ Under-recognised → under-diagnosed
- ▶ Estimated total cost associated with sleep disorders - **AUD\$36 billion per year** (Deloitte Access Economics 2011)
- ▶ Sleep Disordered Breathing = **AUD\$21 billion**
Insomnia = **AUD\$10 billion**
Restless Limbs Syndrome = **AUD\$4 billion**

Sleep for Health and...

Fatigue Facts...

- increases sick time, absenteeism, rate of turnover
- increases tendency for risk-taking
- at least 20% of fatal and 30% of serious vehicle accidents are related to fatigue
- in the surface mining industry 60-65% of truck haulage accidents are directly related to operator fatigue



Fatigue Management – it's about prevention

- ▶ Resolving issues of shiftwork (rostering, hours of work)
- ▶ Implementing 'blanket' strategies to mitigate fatigue risk
- ▶ Providing good **health education** and **fatigue awareness programs**
- ▶ Providing pre-employment and **regular medical examinations**.

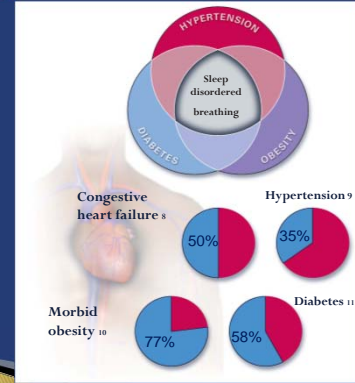
Obstructive Sleep Apnoea (OSA)

- ▶ Most serious sleep disorder
- ▶ Effects 24% of men and 9% of women
- ▶ More prevalent in 30 yr – 60 yr men, 45+ yr women

Estimated that 93% of women & 82% of men with moderate to severe sleep apnoea **remain undiagnosed.**

Young, T., L. Evans, L. Finn, and M. Palta. 1997. Estimation of the clinically diagnosed proportion of sleep apnoea syndrome in middle-aged men and women. . *Sleep* 20(705-706).

SDB prevalence co-morbidities



8 Javaheri et al.
9 Sjoström et al.
10 O'Keefe et al.
11 Resnick et al.

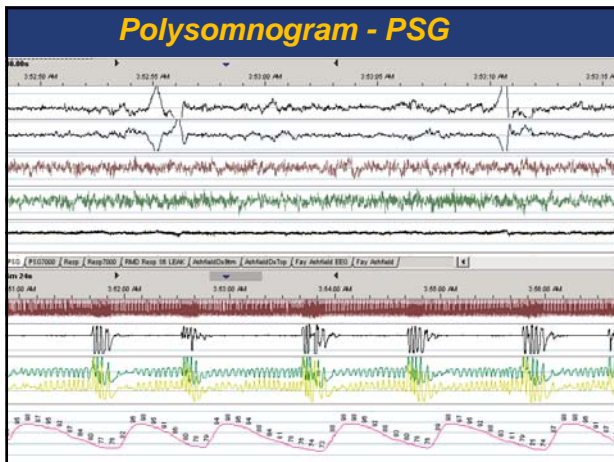
Diagnostic Tests

- ▶ Polysomnography – supervised, in hospital/lab
- ▶ Ambulatory studies – unsupervised, at home
 - Airflow and respiratory variables

Sleep for Health and Safety

Diagnosed by in-hospital study





- ### Sleep Disorders Screening model
- ▶ Network of health professionals
 - ▶ Local health clinicians prepare subject, issue devices, download data and email to experts
 - ▶ Full results & report returned 24-72 hours.
 - ▶ Physician consultation, treatment commencement and treatment monitoring via Telehealth

Comparison 'Old' vs. 'New'

	OLD	NEW
Cost of Tests & Consultations	~ \$ 3,000 (x 2)	\$500
Travel costs	~ \$ 2,000 (x 2)	NA
Time off work	+++	+
Time to diagnosis	weeks to months	< 1 week
Time to commencement of treatment	weeks to months	1 – 2 weeks
Monitoring CPAP compliance	Yearly	Monthly (as required)
No. Subjects screened	+	+++

17

Telehealth Sleep Screening - 2007 - 2012

TASK	2007	2008	2009	2010	2011	2012
Staff Training		Face to face				
				Video conferencing		On-Line re-assessments
Education		Face to face			On-Line re-assessments	
Test Analysis			On-Line			
Reporting			On-Line			
CPAP commencement		Face to face				Videoconferencing
Tx Monitoring		Face to face			Videoconferencing	
Clinical Consults		Face to face			Videoconferencing	

18

Sleep and Telehealth

- ▶ Improved access to specialized clinicians
- ▶ E-education – to employees and clinicians
- ▶ E-monitoring of treatment compliance – permits prompt interventions and lowers fatigue risk

19

Conclusion

- ▶ Undiagnosed and untreated sleep disorders significantly contributes to employee ill health and decreased productivity.
- ▶ Advances in sleep technology allow ambulatory screening
- ▶ Telehealth allows for cost effective and time efficient programs for screening and treatment pathways

20