



All work and no sleep makes Jack a dangerous boy!

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What's on the menu?



- Sleep and fatigue – what are they?
- Why be concerned?
- Identifying sleepiness and fatigue.
- Common sleep disorders and how to recognise them.
- Managing for fatigue.
- Sleep hygiene – what you can do.

What is fatigue?



Many interpretations and connotations of the word “fatigue”

- “Physical” - reaching the limits of physiological endurance
- “Mental” - psychological, emotional or cognitive function limits reached
- “Sleepy” - inability to maintain wakefulness or awareness (deprivation)

Why worry?

Sleep Disorders:

- Individual level: personal misery and tragedy
 - loss of employment
 - driving and industrial accidents
 - poor decision making
 - family breakdown and social isolation
- 1.2 million Australians 80% remain undiagnosed
- Societal level:
 - 9.1% of workplace injuries
 - 8.3% of depression
 - 7.6% of non-work related road accidents
- **Cost: \$36.4 billion per year** (Deloitte Access Economics 2010)



Why so much?



Exxon Valdez oil spill



Chernobyl

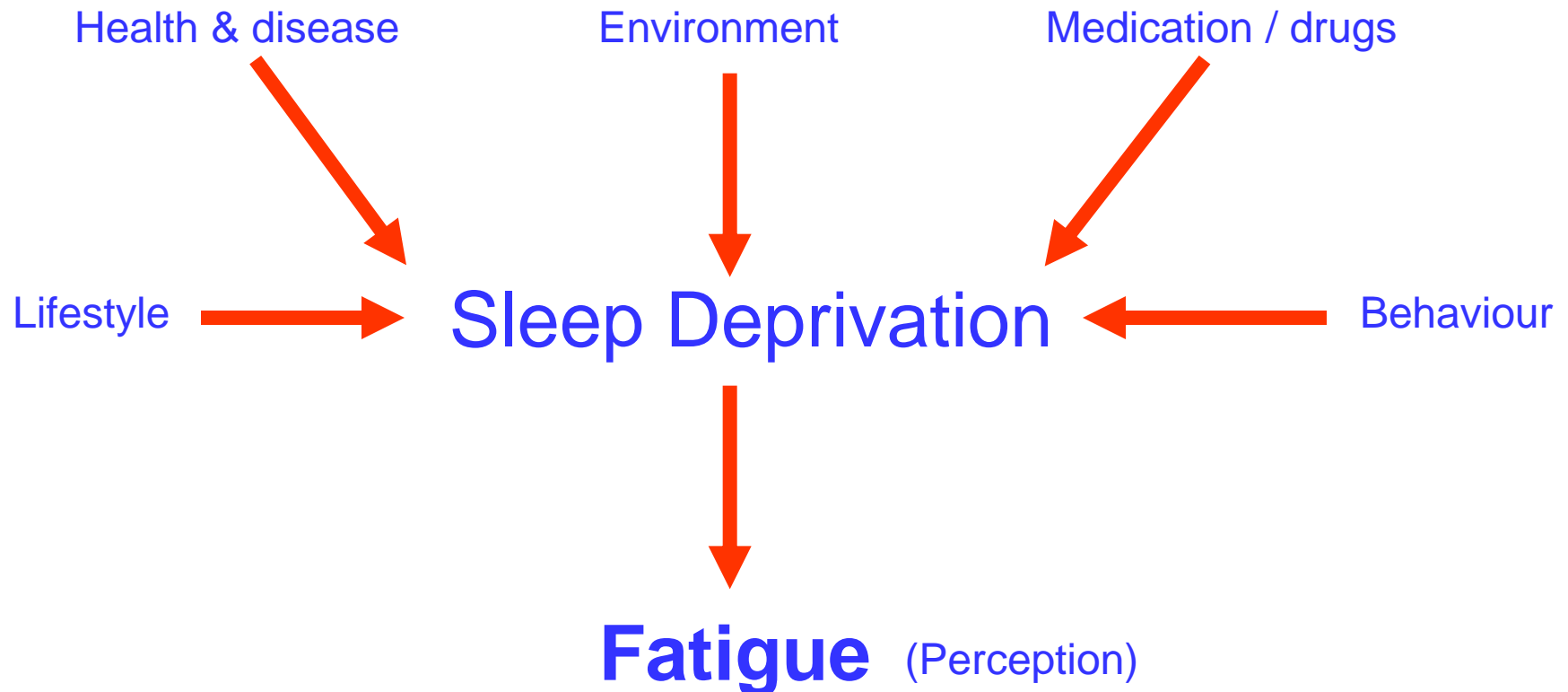


Industrial accidents

Road accidents



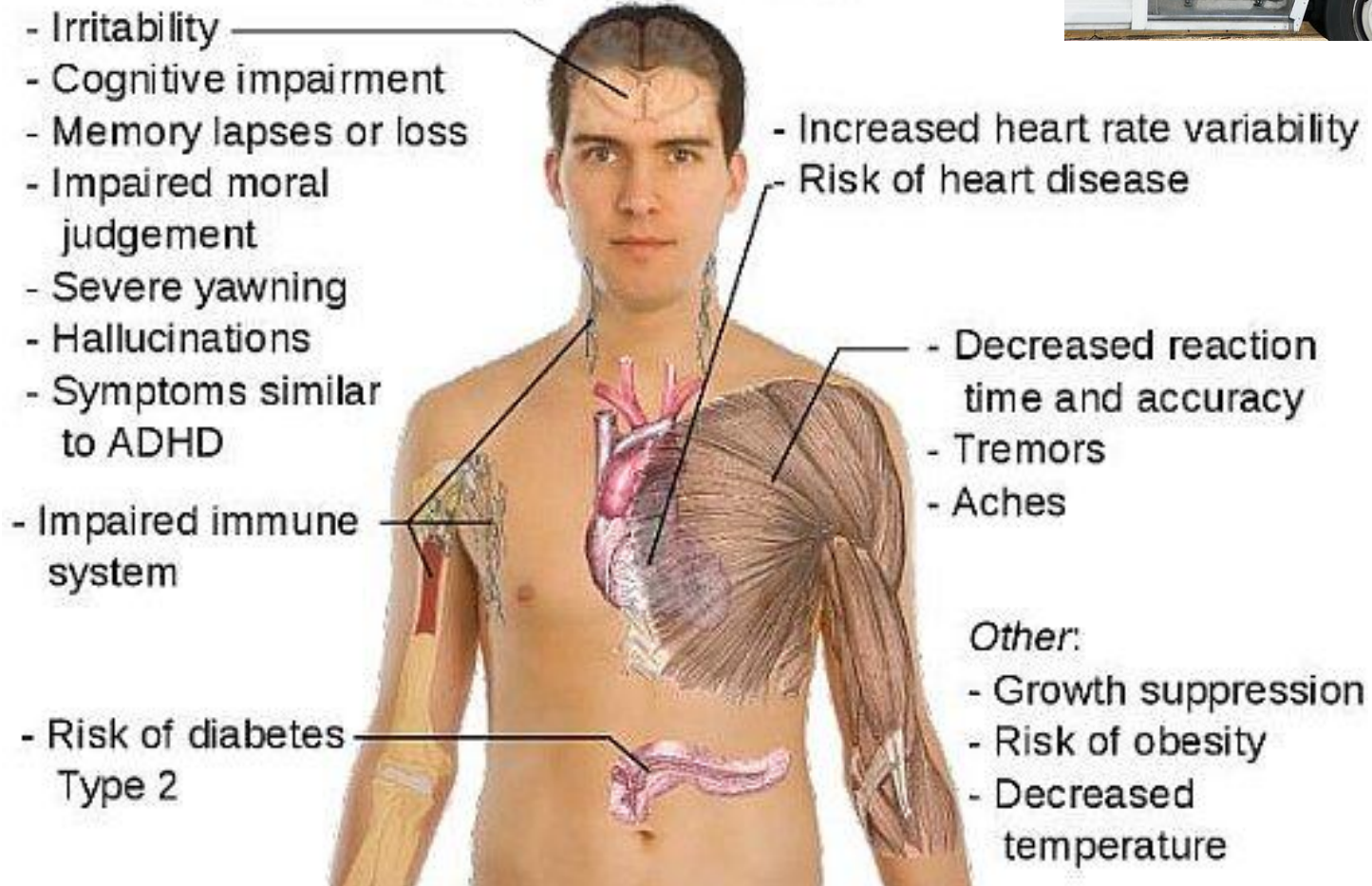
Sleep and Fatigue



“There is only one cause of fatigue – sleep deprivation however there are many causes of sleep deprivation”

Sleep Deprivation

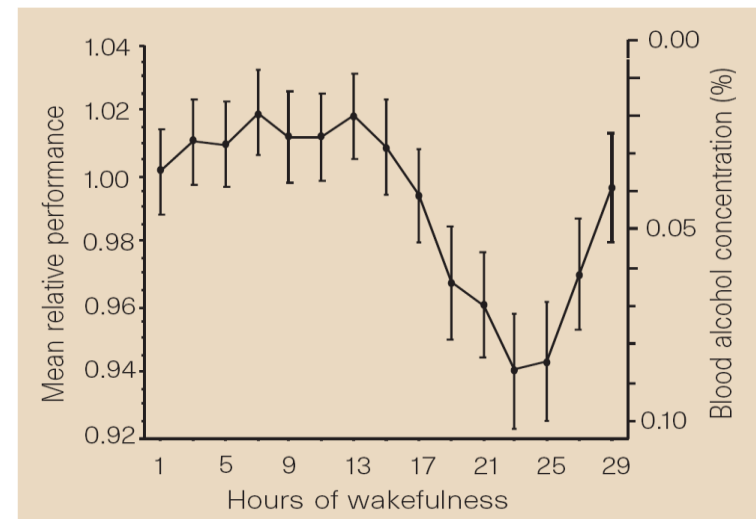
Effects of Sleep deprivation



Consequences?

- Reduced attention / Inability to concentrate
- Communication difficulties - *increasingly difficult to decide what needs to be said, how to say it or what someone else said*
- Mood changes - includes increased irritability, depression and apathy
- Slowness in perception, understanding and responsiveness
- Encoding / decoding difficulties - *more difficult to process information*
- Faulty short-term memory - *information forgotten or recalled incorrectly*
- Increasing omissions and carelessness
- Hallucinations
- Multisystem failure

Dawson D, Reid K. Fatigue, Alcohol and performance impairment.
Nature 1997;**388**(6639):235



Fatigue Management

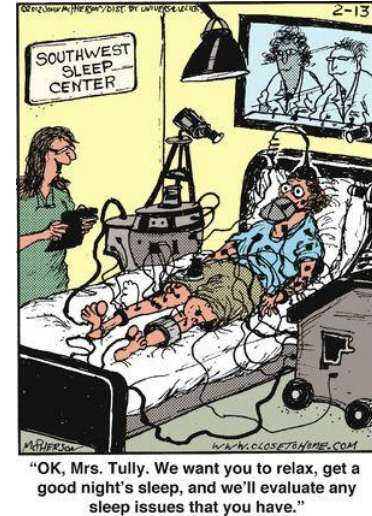
- Preventative maintenance: **Sleep!**
- Minimise deprivation through planning and education
- Avoid drugs and alcohol, be conscious of medication effects
- Scheduled naps may be an option
- Rostering: explore options and collaborate with management
- Be aware of accumulation of both chronic and acute fatigue
- Fatigue assessment tools “Ready Reckoners”
- No single solution so local design is essential



Sleep Disorders

(>100 characterised)

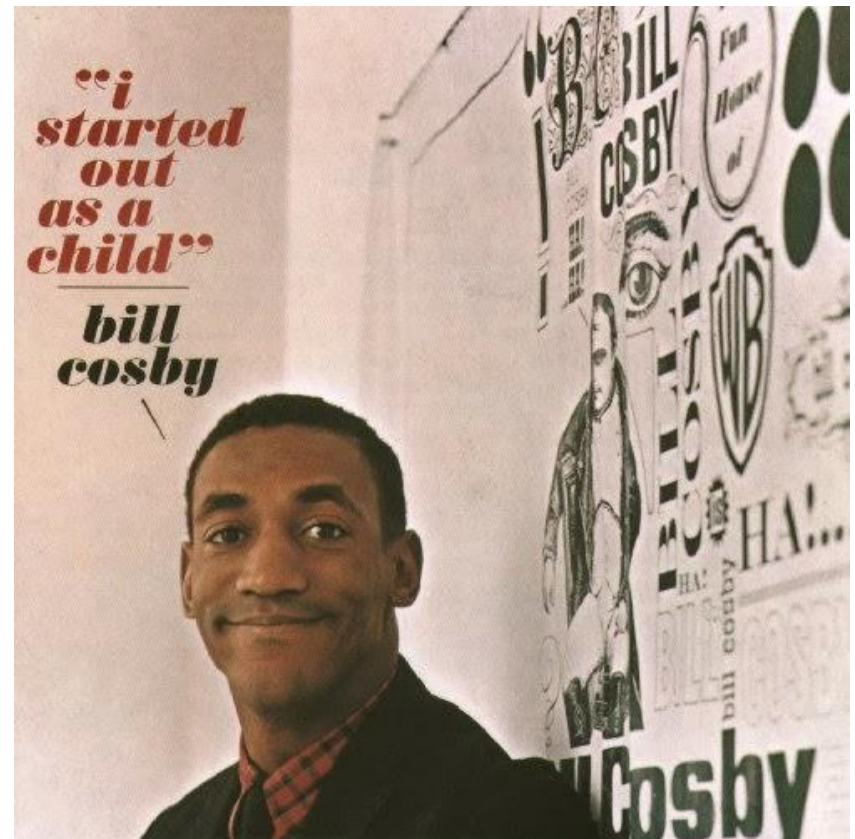
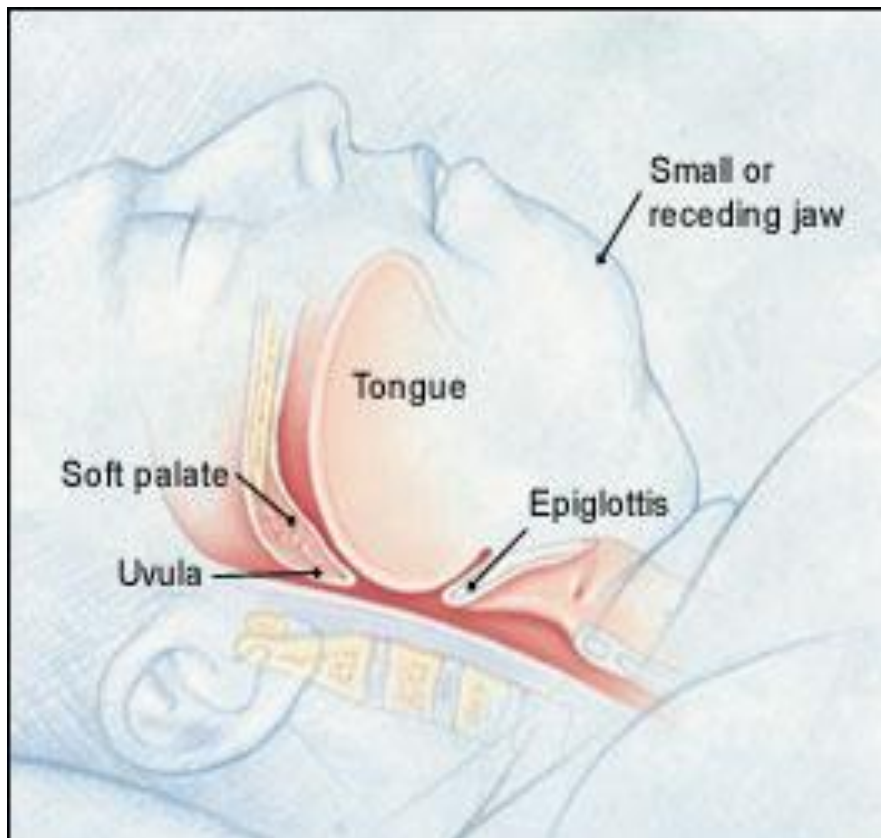
- Sleep disordered breathing (>5%)
 - Obstructive sleep apnoea
 - Central sleep apnoea (sleep hypoventilation, periodic breathing)
- Insomnia related disorders (>10%)
- Narcolepsy
- Nightmares, night terrors
- Periodic Leg Movements in Sleep
- Behavioural sleep disorders
 - sleep walking, talking, complex behaviours
 - REM sleep behaviour disorder



Sleep Apnoea Syndrome



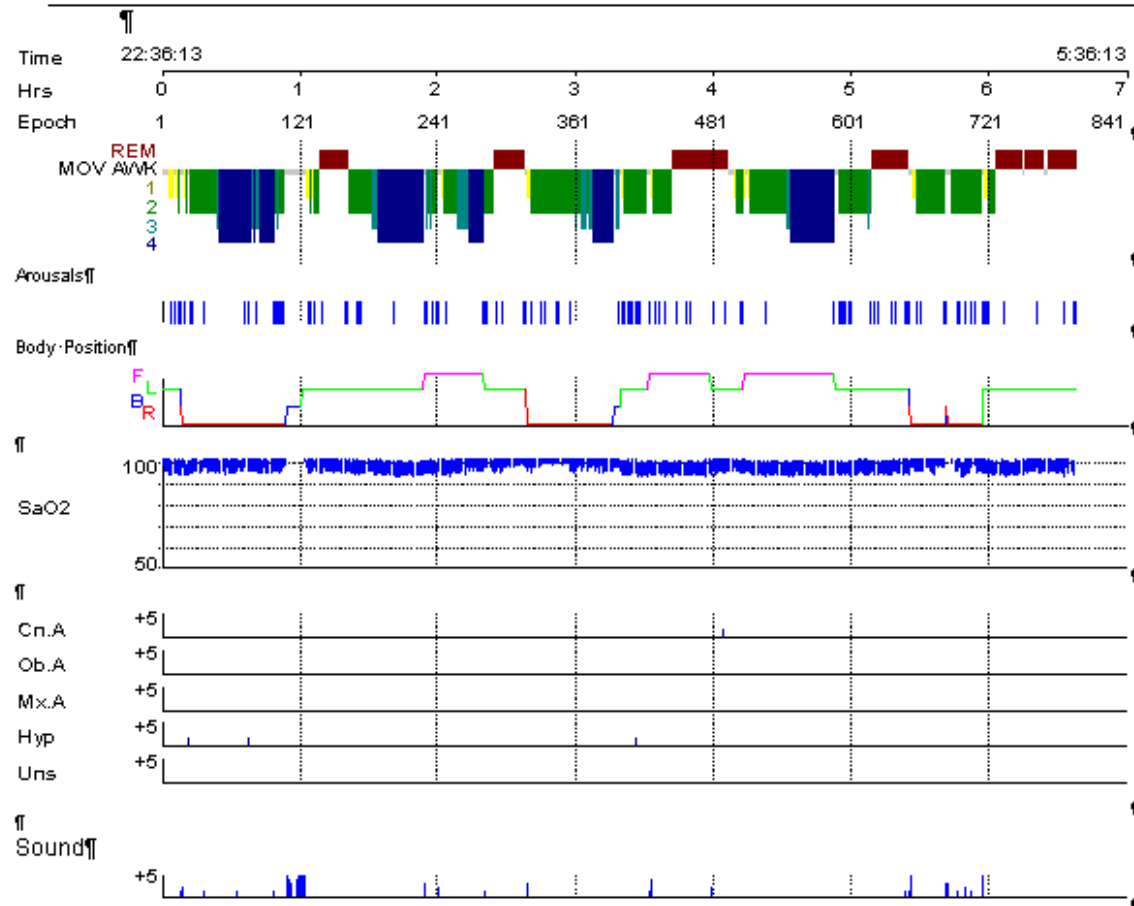
“The Giant”



The Prince Charles Hospital
Sleep and Respiratory Failure Investigation Unit
Diagnostic Sleep Investigation Report



Patient Name: **Normal** → Study Date: → **2/2/2000**
UR: → **000000** → Sex: → Female → Date of birth: → **2/2/1958**
Weight: → **69.9 Kg** → Height: → **166.5 cm** → BMI: → **25.0 Kg/m²**

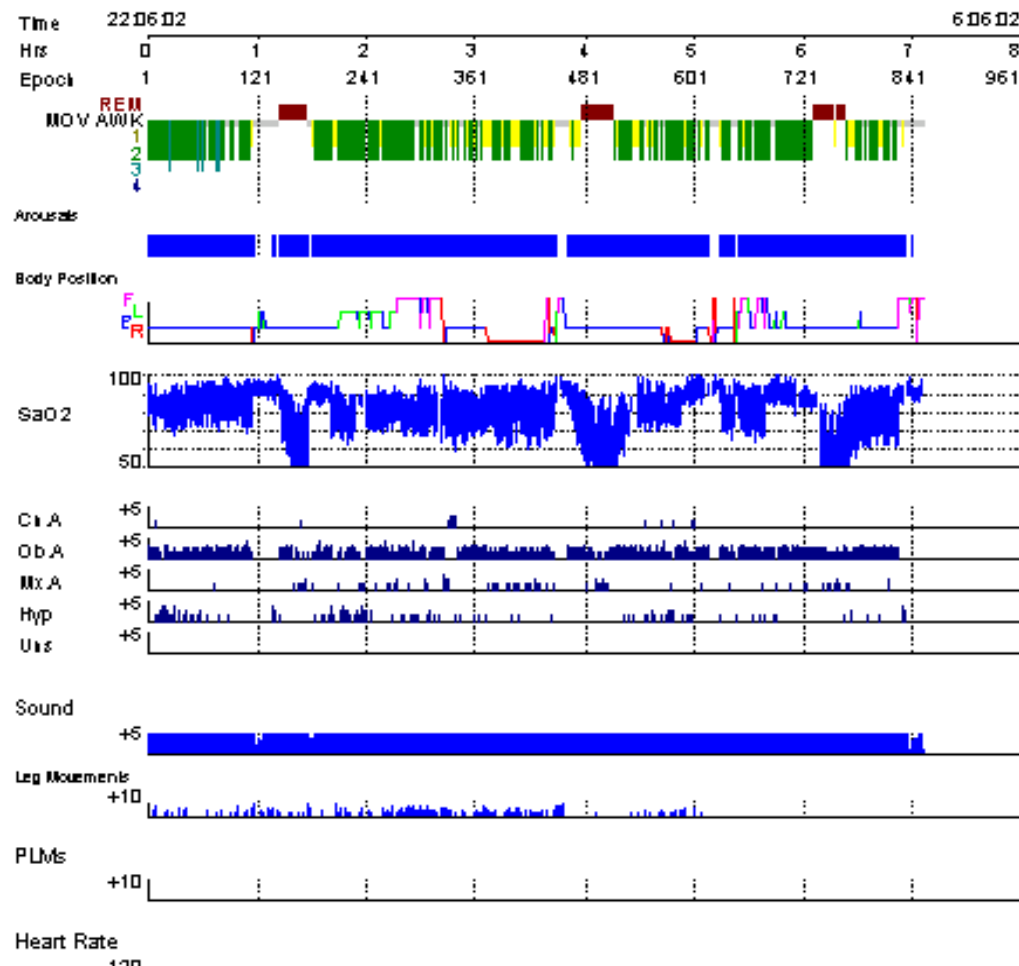


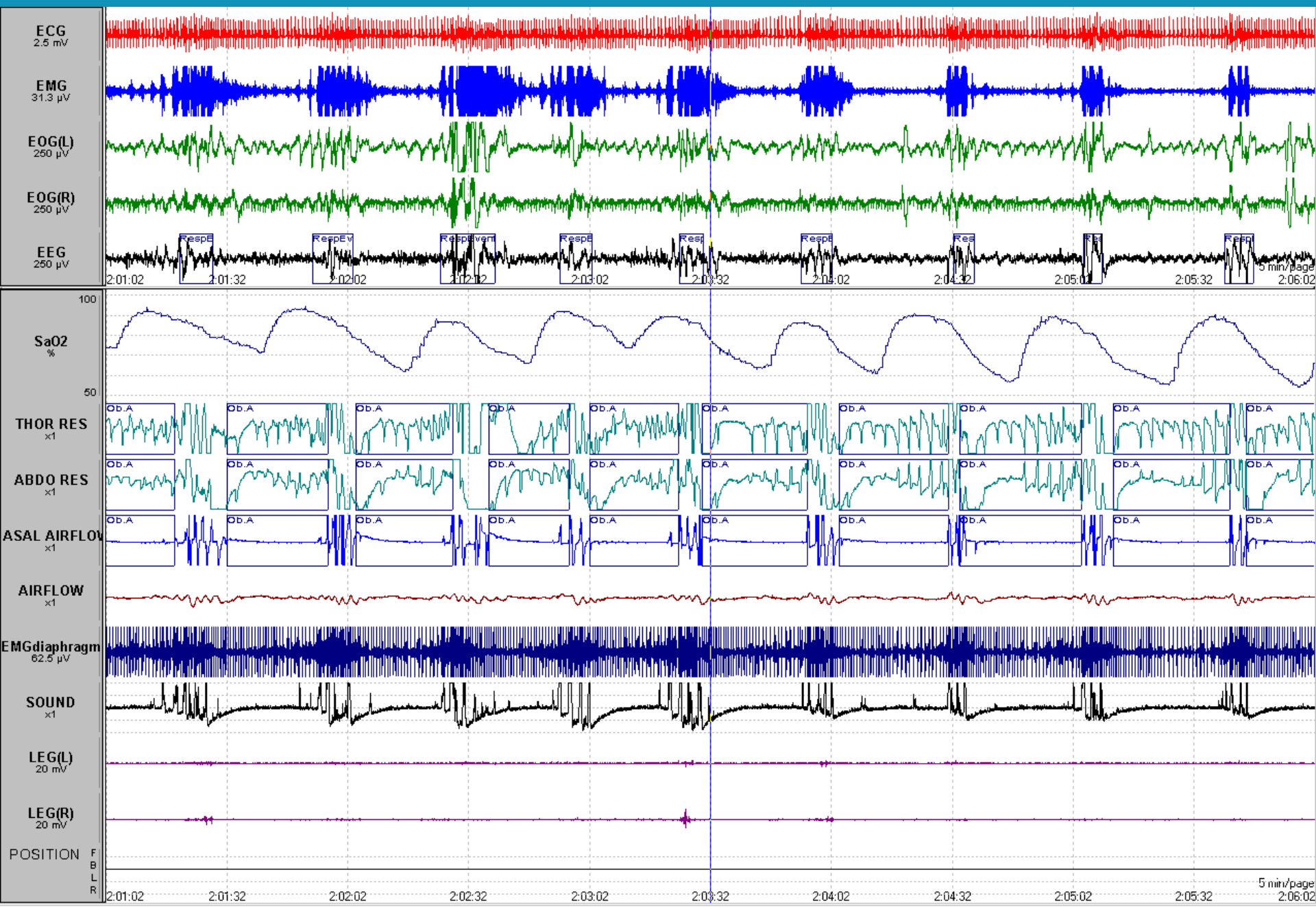
The Prince Charles Hospital
Sleep and Respiratory Failure Investigation Unit
Diagnostic Sleep Investigation Report



Patient Name: Severe Obstructive Sleep Apnoea
UR: 000000 **Sex:** MALE
Weight: 175.6 Kg **Height:** 177 cm

Study Date: ??/??/2000
Date of birth: ??/??/1969
BMI: 55.9 Kg/m²





Health Risks?

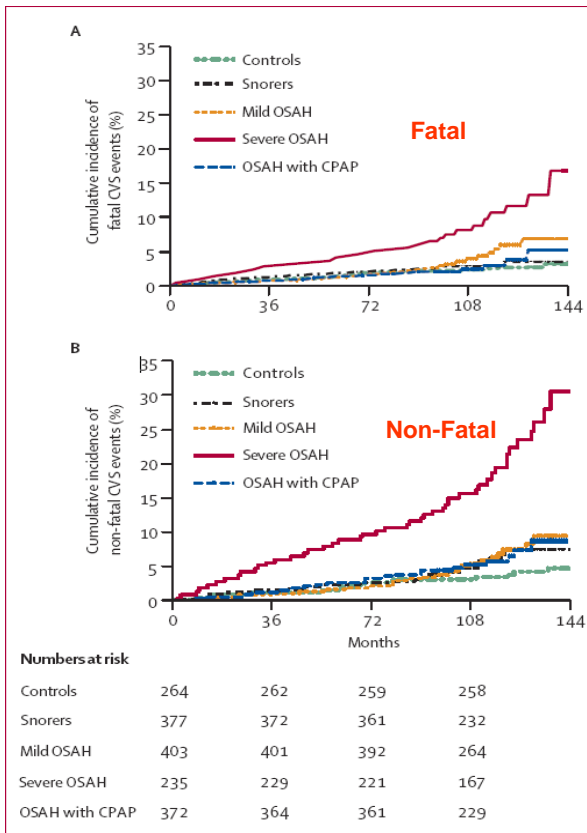


Figure 2: Cumulative percentage of individuals with new fatal (A) and non-fatal (B) cardiovascular events in each of the five groups studied

Marin et al. *Lancet* 2005; 365: 1046–53

Table 2. Unadjusted and Adjusted Hazard Ratios for the Risk of Stroke or Death from Any Cause.*

Covariate	Unadjusted Hazard Ratio (95% CI)	Adjusted Hazard Ratio (95% CI)
Age (yr)	1.09 (1.06–1.11)	1.08 (1.06–1.11)
Male sex	0.99 (0.62–1.60)	0.78 (0.48–1.28)
Race		
White (reference group)	1.00	1.00
Black	0.96 (0.39–2.38)	0.98 (0.39–2.46)
Other	0.91 (0.42–1.98)	0.94 (0.43–2.05)
Body-mass index	0.99 (0.97–1.02)	0.99 (0.96–1.02)
Current smoker	1.21 (0.90–1.64)	1.46 (0.78–2.98)
Current consumption of alcohol	1.03 (0.86–1.22)	0.94 (0.75–1.18)
Diabetes mellitus	1.56 (1.02–2.59)	1.31 (0.76–2.26)
Atrial fibrillation	1.56 (0.79–3.12)	0.91 (0.45–1.86)
Hyperlipidemia	1.04 (0.64–1.68)	1.01 (0.61–1.66)
Hypertension	1.48 (0.95–2.28)	1.19 (0.75–1.90)
Obstructive sleep apnea syndrome	2.24 (1.30–3.86)	1.97 (1.12–3.48)

* Hazard ratios were adjusted for all other covariates in the model. CI denotes confidence interval.

Yaggi et al 2005 NEJM

Recognising Sleep Apnoea

- Daytime somnolence
- Snoring - loud
- Witnessed apnoeas
- Sleep disruption:
 - choking arousals → arousals (nocturia)
- Cognitive disturbance
 - fatigue
 - memory problems
 - mood changes / depression
- Impotence



Sleep Hygiene

- Go to bed to sleep only when you are sleepy.
- Make the bedroom a place to sleep. Remove anything work related (quiet, dark and cool).
- Do not watch television, eat or drink in bed. Read only if this helps getting to sleep.
- Avoid caffeine, nicotine, bright light and alcohol before bed.
- Maintain a regular bedtime, sleep, waking and exercise routine.



Sleep Hygiene 2



- Do not lie in bed if you are anxious about sleeping or getting to sleep.
- Rationalise problems before going to bed. Write down any concerns for later.
- Alcohol and sleeping medications do not improve sleep.
- Let friends and family be aware of your sleeping and working times.
- If you have ongoing issues with being able to sleep or are overly sleepy during the daytime, seek professional advice.

Myths

- Fatigue can be overcome by an act of will
- Fatigue is all in the mind
- Fatigue is a sign of not having the right stuff
- Fatigue comes from overexertion
- Rest can substitute for sleep
- Sleeping tablets improve quality of sleep
- Caffeine overcomes fatigue and improves performance
- Leaders often regard themselves as being the least vulnerable to fatigue
- I can make it – “We’ll all be home soon”



WASHINGTON (CNN) -- Three Air Force officers fell asleep while in control of an electronic component that contained launch codes for nuclear intercontinental ballistic missiles, a **violation of procedure**, Air Force officials said Thursday. Updated 10:05 p.m. ET July 24, 2008

Summary



- Sleep deprivation from any cause will result in high risk of fatigue related errors.
- Fatigue can result in very high personal, public and commercial costs.
- Fatigue can be managed if recognised and effective policy is in place.
- Sleep cannot be denied and deprivation has serious health consequences.
- Sleep disorders are common and 80% remain undiagnosed and carry high risk.
- Organisations need to be aware of sleep hygiene and associated risks.
- Professional services are available and accessible.

