How I went to sleep and what I found there

M Majurey EN RPSGT M.Sc.M. (Sleep Medicine)
Charge Clinical Physiologist
Laugh and the world laughs with you
Snore and you snore alone!
Waikato Hospital Sleep Lab

- Dr Cat Chang – Resp/Sleep Physician
- Adele Jack – Clinical Physiologist
- Emie Garcia – Clinical Physiologist
- Ella Paez – Clinical Physiologist
- Belle Miguel – Clinical Physiologist
- Nelson Pacis – Clinical Physiologist
- Receptionists – Jacky and Raewyn
NOT TO BRAG, BUT I'M SO DAMN GOOD AT SLEEPING

I CAN DO IT WITH BOTH EYES CLOSED.
Do you know that awesome feeling when you get into bed, fall right to sleep, stay asleep all night, and wake up feeling refreshed?

Me neither
Coffee!
If you're not shaking, you need another cup.

There are only two times I feel stress: Day and Night.
ERROR 4:04 AM
SLEEP NOT FOUND!

lolsheaven.com
Do you know that awesome moment when you wake up in the morning and you are full of energy?

Me neither!
"All I remember is the smell of melted butter, and then I woke up with my heart racing."
REMEMBER THE TWENTY EXTRA YEARS YOU ADDED TO YOUR LIFE THROUGH CLEAN, HEALTHY LIVING? - WELL, THESE ARE THEM.
One of only 4 public sleep investigation units in NZ performing full polysomnography.

Under utilised

Long waitlist – funding issues

Level 01 Waiora Waikato Building
No windows
Little noise
Four Sleep Beds

- Bed 1 > Full Polysomnography with ABGs, TcCo2 monitoring. Used for Respiratory or Cardiac Failure, Motor Neurone Disease, Duchenne Muscular Dystrophy, morbidly obese and Paediatric patients.
- Bed 2 > TcCo2. Is used for less unwell patients, MSLT - used to diagnose Narcolepsy and MWTs
- Both have BiPAP and oxygen available
Beds cont’d

- Bed 3 and bed 4 full PSG for walking well

- Beds 1 to 4 are fully attended and 3 of them can have video recording done if required

- Bed 5 > a virtual bed. In lab set up for home or outside room > oximetry or Autoset T.
GP or Hospital Dr Presentation

- Often under threat from spouse / employer
- Near miss driving / work accident
- Grumpy/Depressed
- Denial / Uncooperative
Te Ika A MAUI
The fish of MAUI

95%

500,000 Maori
100,000 30% Maori

Level 4 studies beds 2 FTE
we do 70ish studies a year
46,000 42.6% Maori
10ish studies per year
Prevalence of Obstructive Sleep Apnoea
Maori cf other New Zealand adults

Men

<table>
<thead>
<tr>
<th>RDI</th>
<th>Māori</th>
<th>non-Māori</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥5</td>
<td>25</td>
<td>10</td>
</tr>
<tr>
<td>≥10</td>
<td>15</td>
<td>5</td>
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<tr>
<td>≥15</td>
<td>10</td>
<td>2</td>
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</table>

Women

<table>
<thead>
<tr>
<th>RDI</th>
<th>Māori</th>
<th>non-Māori</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥5</td>
<td>15</td>
<td>5</td>
</tr>
<tr>
<td>≥10</td>
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<td>2</td>
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<tr>
<td>≥15</td>
<td>5</td>
<td>1</td>
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*weighted by the Wellington population proportions of age, gender and ethnicity.
Why bother about sleep disorders?

- Sleep disorders are *common*
- Sleep disorders are *serious*
- Sleep disorders are *treatable*
- Sleep disorders are *underdiagnosed*
The Problem of Sleepiness

- Disrupts daily life
- 0.5 – 5% + of population
- Road accidents
- Occupations
- Marital
- Caused by lifestyle factors and
- Sleep disorders
WHAT IS THIS
"SLEEP" YOU SPEAK OF??
Why do we sleep?

Not known!

- Total sleep deprivation in animals
  - Death in 40 days
- Unethical in humans, but:
  - Impaired thinking and memory
  - Impaired mood
  - Increased risk taking
  - Immune / hormonal effects
Clues to Lack of Sleep

- “Normal” range is 5 – 10 hours/night
- Alarm clock use
- Weekend catch-up
- Sleep loss $\alpha$ number of jobs & kids
**OSAS - Epworth Score.**

How likely are you to doze off or fall asleep (in contrast to just feeling tired) in the following situations?

Even if you have not done some of these things recently, try to work out how they would have affected you.

Use the following scale to choose the most appropriate number for each situation.

<table>
<thead>
<tr>
<th>SITUATION</th>
<th>CHANCE OF DOZING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sitting and reading</td>
<td></td>
</tr>
<tr>
<td>Watching TV</td>
<td></td>
</tr>
<tr>
<td>Sitting inactive in a public place (theatre or meeting)</td>
<td></td>
</tr>
<tr>
<td>As a passenger in a car for an hour without a break</td>
<td></td>
</tr>
<tr>
<td>Lying down to rest in the afternoon when circumstances permit</td>
<td></td>
</tr>
<tr>
<td>Sitting and talking to someone</td>
<td></td>
</tr>
<tr>
<td>Sitting quietly after a lunch without alcohol</td>
<td></td>
</tr>
<tr>
<td>In a car, while stopped for a few minutes in traffic</td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
</tr>
</tbody>
</table>

0 = no chance of dozing
1 = slight chance of dozing
2 = moderate chance of dozing
3 = high chance of dozing

Refer:
Epworth > 10
Snorer
Overweight
Witnessed apnoeas.
if people were meant to pop out of bed we'd all sleep in Toasters!

Silly Stupid Statuses & Stuff 24/7
Sleep-Disordered Breathing

A Spectrum of Abnormality

Natural Progression

Normal
Snoring
Upper Airway Resistance Syndrome
Sleep Hypopnea
Obstructive Sleep Apnea
Obesity Hypoventilation Syndrome

Treatment
Take snoring - add 4 cans of beer
Take OSA and add 4 cans of beer
Alcohol

- Non Maori more likely to be alcohol drinkers and to drink more often
- Maori more likely to drink more in one session
- Maori have higher mortality rate with more alcohol related deaths

- The burden of death, disease and disability due to alcohol in New Zealand: Feb 2005
  
  Ricci Harris, Paparangi Reid and Phillipa Gander were involved with this paper
The Danger of Sedative Medications
Establish Contextual Information

Diagram showing stages of sleep:
- Awake
- Stage I
- Stage II
- Stage III
- Stage IV
- REM
Normal Sleep Architecture

<table>
<thead>
<tr>
<th>Time</th>
<th>21:52:42</th>
<th>5:52:42</th>
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<tbody>
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<td>Hrs</td>
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<td>841</td>
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<tr>
<td></td>
<td>961</td>
<td></td>
</tr>
</tbody>
</table>

REM

MOV

AWK

1
2
3
4

1  2  3  4  5  6  7  8
“OK, Mrs. Tully. We want you to relax, get a good night’s sleep, and we’ll evaluate any sleep issues that you have.”
Despite having more severe OSAS CPAP acceptance is lower in Maori and Pacific people.

Whyte K et al (abstract)
Sleep Fragmentation

REM
MOV A W K
1
2
3
4

SaO2

TcCO2

Cn.A
Ob.A
Mx.A
Hyp
Uns
+5
+5
+5
+5
+5
Clues to Sleep Apnoea

- “Heavy” snoring
- Sleepy
- Impotence
- Witnessed apnoeas
- Hypertension
- Diabetes
- Central obesity
Sleep Apnoea - Consequences

- **Sleepiness**
  - Car accidents
  - Work
  - Family / marriage
  - Memory & concentration
  - Sex

- **Physical**
  - Heart
  - Blood pressure
  - Strokes
  - Respiratory failure

- **Medico-legal**
  - Driving
  - Dangerous occupations
  - Strategic occupations
  - Diminished responsibility
OSAS and Driving

- Well validated
- Mainly ignored
- Long distance drivers
- 15 x risk of accident (Horstmann, Sleep 2000)
- Not asleep - inattention due to sleepiness

Accidents / driver/ 5 years

![Graph showing the relationship between RDI and accidents](image)
As many as 63% of stroke and TIA sufferers experience SDB.

Stroke and TIA patients are five times more likely to suffer from SDB than the general population.

SDB and Post-Stroke Rehabilitation

Treating Stroke Patients with SDB

- greatly reduces the risk of a second stroke
- improves cardiac function
- lowers blood pressure
- increases life expectancy
- improves functional outcomes
Schizophrenia

- Locally high rate of referral
- Case reports of improvement
- Local case

Int J Psych Med 2003 33:305
Diabetes

- Obesity / metabolic syndrome
- Similar risks
- 595 OSA men
  - 30% type 2 diabetes
  - 20% insulin resistant
  
- 26 non-obese DM (40-50 yrs, BMI 24)
  - > 30% OSA

- NZ: Obese, Maori, DM = 85% prob OSA
Diabetes

- DM + obesity + BP = 70% chance OSA
- CPAP in this group improved insulin responsiveness by 32% - Brooks et al J Clin Endo Metab 1994 79:1681
Paediatric

- Syndromes
  - Pierre-Robin sequence
  - Crouzon
- Chiari malformation
- Downs
- Tonsils
- Obesity
Neuromuscular

- CSA
- Hypoventilation
  - Kyphoscoliosis
  - Muscular dystrophies
  - Motor neurone disease
- Tetraplegia (trauma) 25 – 40 % OSA
Sleep-Disordered Breathing and Hypertension

Normal blood pressure (and heart rate response) to sleep is to decline 10% (10-20 mmHg)

- Those who don’t are “non-dippers”
- Non-dipping carries risk of
  - Ventricular arrhythmias
  - Cardiac hypertrophy
  - Sudden cardiac death (in women)
Treatment of Hypertension in SDB

- CPAP Rx lowers BP in hypertensive sleep apnoeics
  - Compared with placebo
  - In a short time (3 to 7 days)!
Pregnancy

- OSA may develop in pregnancy

- Pre-eclampsia has nocturnal changes similar to OSA
  - Treatment of PET with CPAP reversed changes

Blyton et al Sleep 2004 27:79
OSAS - Treatment.

- Mandibular Advancement Splint.
  - Snoring.
  - Mild OSAS.
  - Expense.
OSAS - Treatment.

**Surgery.**
- Uvulopalatopharyngoplasty.
- Laser Assisted Uvuloplasty.
- Somnoplasty.
- Tracheostomy.

- Snoring.
- Mild OSAS.
- Cost.
- Complications.
OSAS - Treatment.

Nasal Continuous Positive Airway Pressure (nCPAP).
- Most effective.
- Most common.
- Relatively inexpensive.
- Compliance.
- Mask fitting.
- NOT A CURE.
partially blocked upper airway increases inspiratory effort and the vibrations of soft tissue that causes snoring
101 POSITIONS

102 EXCUSES