Disclosure

• Other peoples’ data
• Other peoples’ ideas
• No funding on related projects
• No conflict of interest
In the USA...

Obstructive Sleep Apnea is a significant, yet under-diagnosed and under-treated chronic disease in the US.

OSAS is defined as frequent episodes of apnea and/or hypopnea and functional impairment (e.g. excessive sleepiness)

US population: 307M

OSA Syndrome (OSAS) 12M

OSA with AHI ≥ 15 excl. OSAS 11M

Mild OSA with AHI ≥ 5 29M

Moderate to severe OSA has an AHI ≥ 15

Diagnosed 4.1M

Undiagnosed 18.9M

CPAP 3.3M

Compliant 2.0M

Surgery 0.2M

Non-compliant 1.3M

Other devices, Rx / OTC 0.4M

Lifestyle 4.1M

1 OSAS prevalence: 3 - 5%; OSA prevalence with AHI ≥ 15: 6.5 - 8.5%; mild OSA prevalence 9 - 24% (assumed 17%)
2 CSAS diagnosis rates are estimated to be 15-20%
3 Estimate from expert discussions and literature research. Lifestyle changes are suggested for almost all patients

NOTE: The severity of OSA is often characterized by the AHI; however, there is no strong correlation between AHI and incidence of daytime functional impairment

Prevalence of sleep apnea - Canada

- **858,900 diagnosed** adults >18 (3% of that population)
- 5% in adults >45
- Associated with other health problems
  – Public Health Agency of Canada, 2010
Prevalence of sleep apnea - Alberta

• Population 3.165 million (age 15+)

• 3% = 90,000 (diagnosed)
But...

- “Of those affected by sleep-disordered breathing, fewer than 15 percent have been diagnosed and treated. “
- The Real 800-Pound Gorilla of Presenteeism
- by Peter Farrell, *HBR*, 2013
Total with sleep apnea

X 6

Treated
Qualification

- Six country study
- Q: Able to sleep through the night?
- Mexico 64%
- Canada 55% (ranks 2)
- Source: National Sleep Foundation, 2013
  *International Bedroom Poll*
Impact on quality of life

• Quality Adjusted Life Years

1.00

0
Impact of O.S.A. on QALYs

Treatment → 7% vs 16% capacity
Loss without treatment

0.93 Treated OSA
0.84 Untreated OSA

Pietzsch, SLEEP 34:695
Impact of OSA on resources

• Medical costs
• Losses due to accidents (work / road)
• Reductions in worker productivity
Management of sleep apnea

- Diagnosis
- Treatment
- Prevention
• **Diagnosis**
  – Sleep lab
  – Respirologist
  – Respiratory therapist
Ontario: overnight sleep study (*public pay*)

$375
Diagnosis coverage

• AHS
Wait times for (public) polysomnography

11.6 months

Private labs

- **US:** Polysomnography: $2,625 average (private) (US Sleep Study)
- Alberta $1,200 - $1,500
Resources and costs - treatment

- Pulmonary physician
- CPAP machine $1,000 - $2,500
CPAP Coverage

• Private insurance
• AISH (severely handicapped)
• Social Services
• All the rest pay themselves
Medical cost offsets

• OSA versus Non OSA (Control)
• Year before diagnosis
  – Fifth year before
  – Fifth year after
Medical cost offsets

Source: Albarrak, SLEEP 2005
Medical costs

• Looks at physician fees only
• OSA and other medical services
“Indirect” costs

• Car and Workplace accidents (Harvard Sleep)

$12 billion

$7 billion
“Indirect” costs

- Absenteeism

$16.6 billion
“Indirect” costs

- Presenteeism
- The Real 800-Pound Gorilla of Presenteeism
- by Peter Farrell
- HBR Blog  May 22, 2013
Components of a decision

- Budget

- Outcomes
Treatment impact

- Costs $
- Outcomes 💃
- Costs and outcomes

Cost effectiveness
Areas impacted by treatment

• Medical costs of screening, diagnosis, and treatment

• Vs

• Benefits
  – Quality of life
  – Medical costs for non-treatment
  – Road and workplace accidents
  – Absenteeism
  – Presenteeism
APAP versus CPAP

• Outcomes
  – Treatment pressures (lower for APAP)
  – Clinical measures
    • AHI scores (hypopnea index)
    • Daytime sleepiness
    • Arousals
    • % REM sleep (rapid eye movement)
    • Oxygen saturation

• Results: APAP about same as CPAP
APAP costs

• APAP versus CPAP
  – Treatment (longer term)

• Costs
  – Diagnosis
    • Lab $750
    • APAP $200
  – Titration
    • CPAP $750
    • APAP $200
  – Treatment
    • CPAP $1,200
    • APAP $2,250
Cost summary  CPAP vs APAP

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<th>Diagnosis</th>
<th>Titration</th>
<th>Treatment</th>
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<td>200</td>
<td>2250</td>
</tr>
<tr>
<td>CPAP</td>
<td>750</td>
<td>750</td>
<td>1200</td>
</tr>
</tbody>
</table>
Summary APAP vs CPAP

• Costs about the same
• Outcomes about the same
Summary

• Clinicians look only at the outcomes and effectiveness
• Directors look only at budgetary impacts
• Health technology assessment compares both together
• But nobody looks at cost effectiveness