



English Bulldog
(*Canis familiaris*)



Sleep Disorders in Primary Care

–
a personal view

18/06/2009

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NZ Respiratory & Sleep Institute

Abnormal Sleep

- Disorders of the initiation & maintenance of sleep (DIMS)
 - Insomnia 1° or 2° (medical / psychiatric conditions)
 - PAS
 - PDS
- Disorders of excessive sleepiness (DOES)
 - **Not enough**
 - Obstructive sleep apnoea
 - Narcolepsy
 - RLS/PLMS
- Abnormal behaviors during sleep (Parasomnias)
 - NREM
 - Sleep walking/talking/night terrors
 - REM
 - REM Behavior disorder

30 second System Review Questions

- How do you feel you sleep at night
- Are you sleepy or tired during the day
- What does your partner think about your sleep
- Do you snore most nights

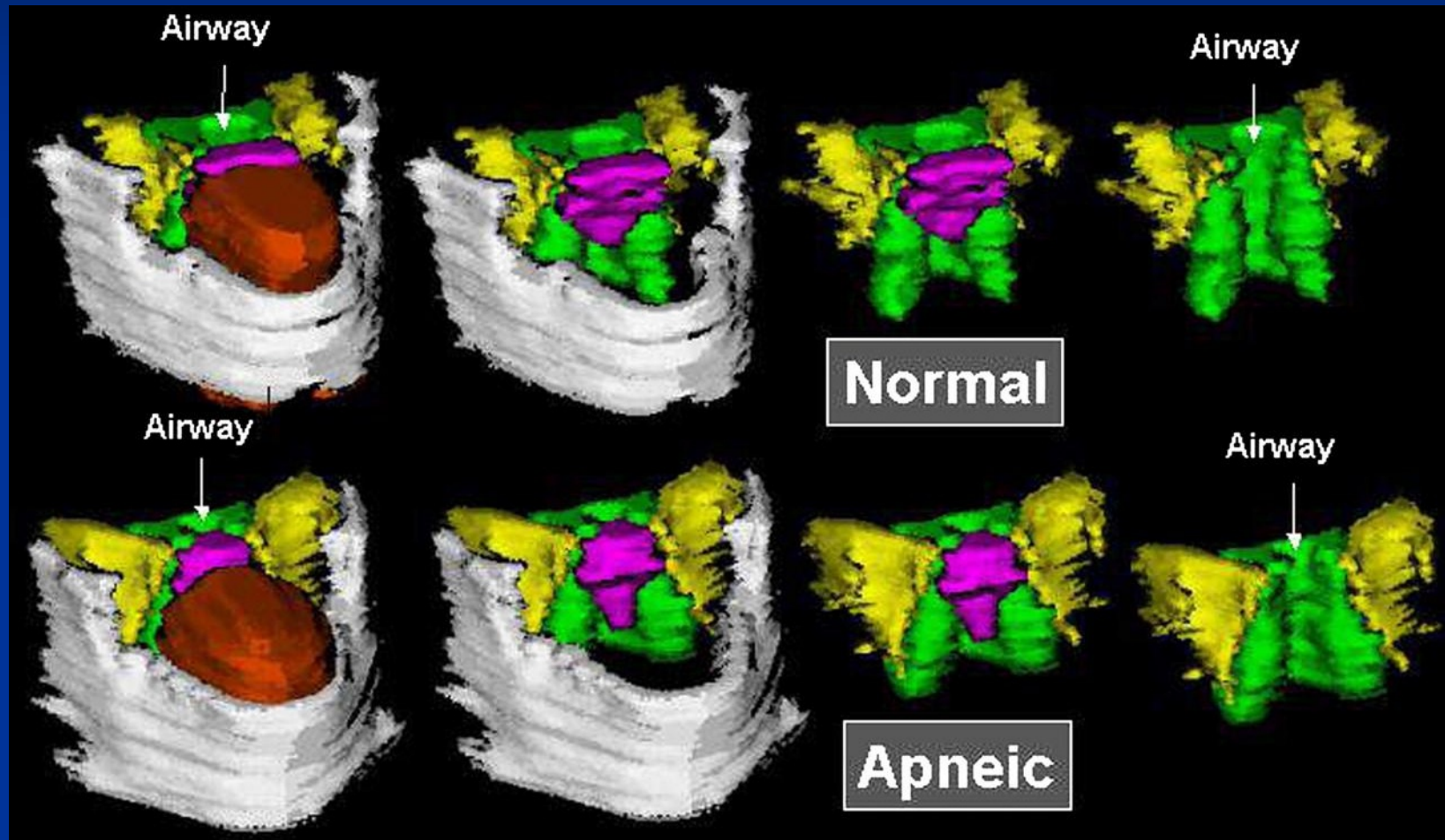
FACTS

- It is never normal to nod off in meetings
 - Common doesn't mean normal
- Snoring is a marker of partial airway obstruction
- Apnoea means "about to die"
- If you don't ask, they won't tell you!
- If symptoms develop slowly: people just change

Snoring, UARS, OSA, OHS

- The disorder is an anatomical disease
- The disease/disorder is common
- There is a continuous range of severity (BP)
- No obstruction = good, lots of obstruction = bad
- There are personal clinical impacts
- There are family impacts
- There are societal impacts
- Treatment works
- Some treatments work better than others
- Treatment has to be used to work
- Some treatment is better than no treatment
- Sometimes 2 treatments are required

Upper airway 3 D anatomy in OSA



Why are we treating this person?

- To help the patient's symptom(s)
 - Ask the patient about their problem, treat the patient, then ask the patient are they better (enough)
- To help the spouse's / family's problem (s)
 - Ask the spouse / family about their problem, treat the patient, then ask the spouse / family are the problems better (enough)
- To reduce the risk to society (sleepiness)
 - Assess with a surrogate which seems to reflect risk of sleepiness / car crash, treat the patient, reassess the surrogate
- To reduce the risk of cardiovascular disease (metabolic / inflammatory consequences)
 - Assess with a surrogate which seems to reflect the risk of cardiovascular disease, treat the patient and reassess the surrogate

Why do we do a test in patients with SDB?

- Diagnosis
 - Need to have access to a sensitive test (Rule out)
- Screening for severe OSA / case finding
 - Need to have access to a specific test (Rule in)
- To stratify severity
- To guide therapeutic choice
- To assess response to treatment

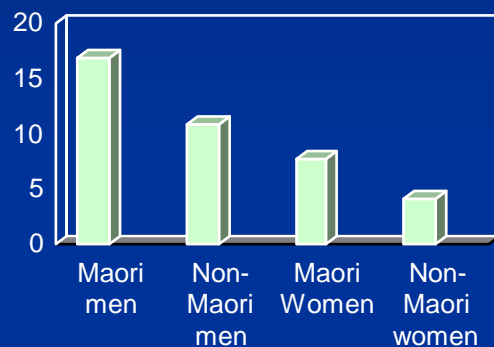
(Screening is a test to detect 100% of those with the disease but will also detect false positive cases. It generates an enriched sample which will require further investigation)

Pathophysiology

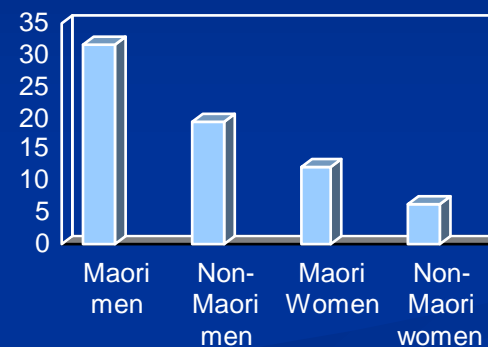
- Abnormally narrowed airway
- Increased collapsibility
- Airway collapse – multi-level problem
 - Palate, base of tongue, pharynx, supraglottis or all levels
- Increased effort
- Sympathetic outpouring
- Desaturation
- Arousal
- Vibration damage to endothelium

Symptoms, Risk Factors

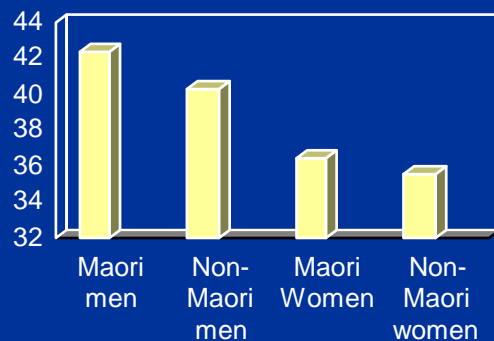
Percent who always snore



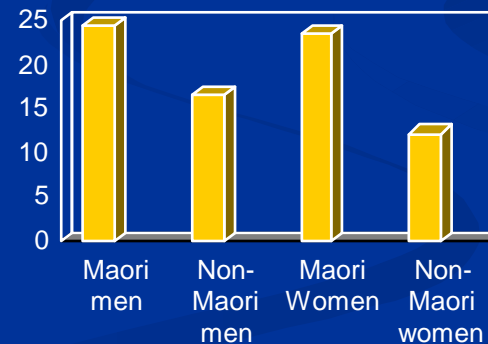
Percent with observed apnoeas



Average neck size (cm)



Percent who have ESS > 10



Source: Random sample of 10,000 NZ adults aged 30-60 yrs, 71% response rate

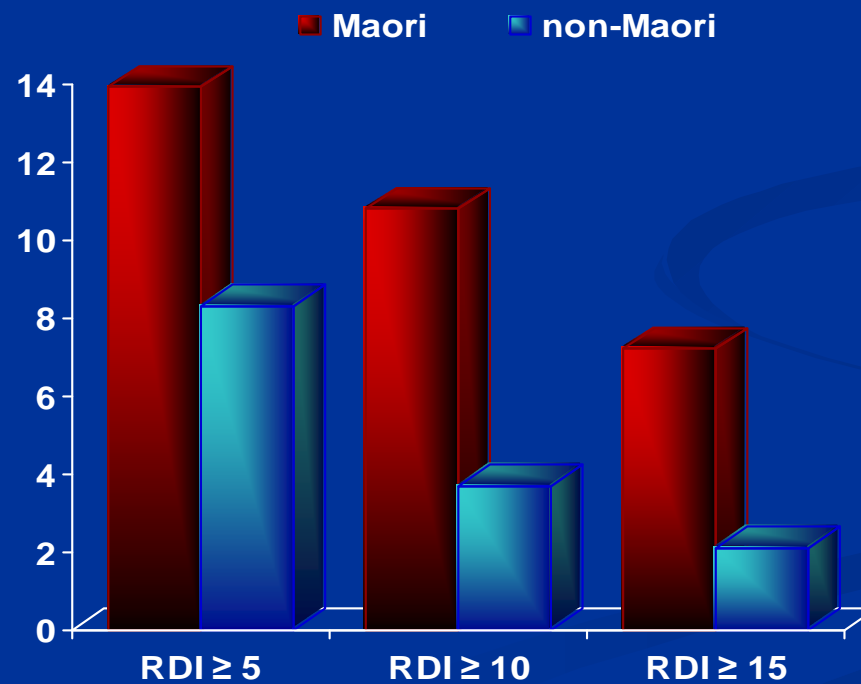
Data courtesy of Dr Ricci Harris

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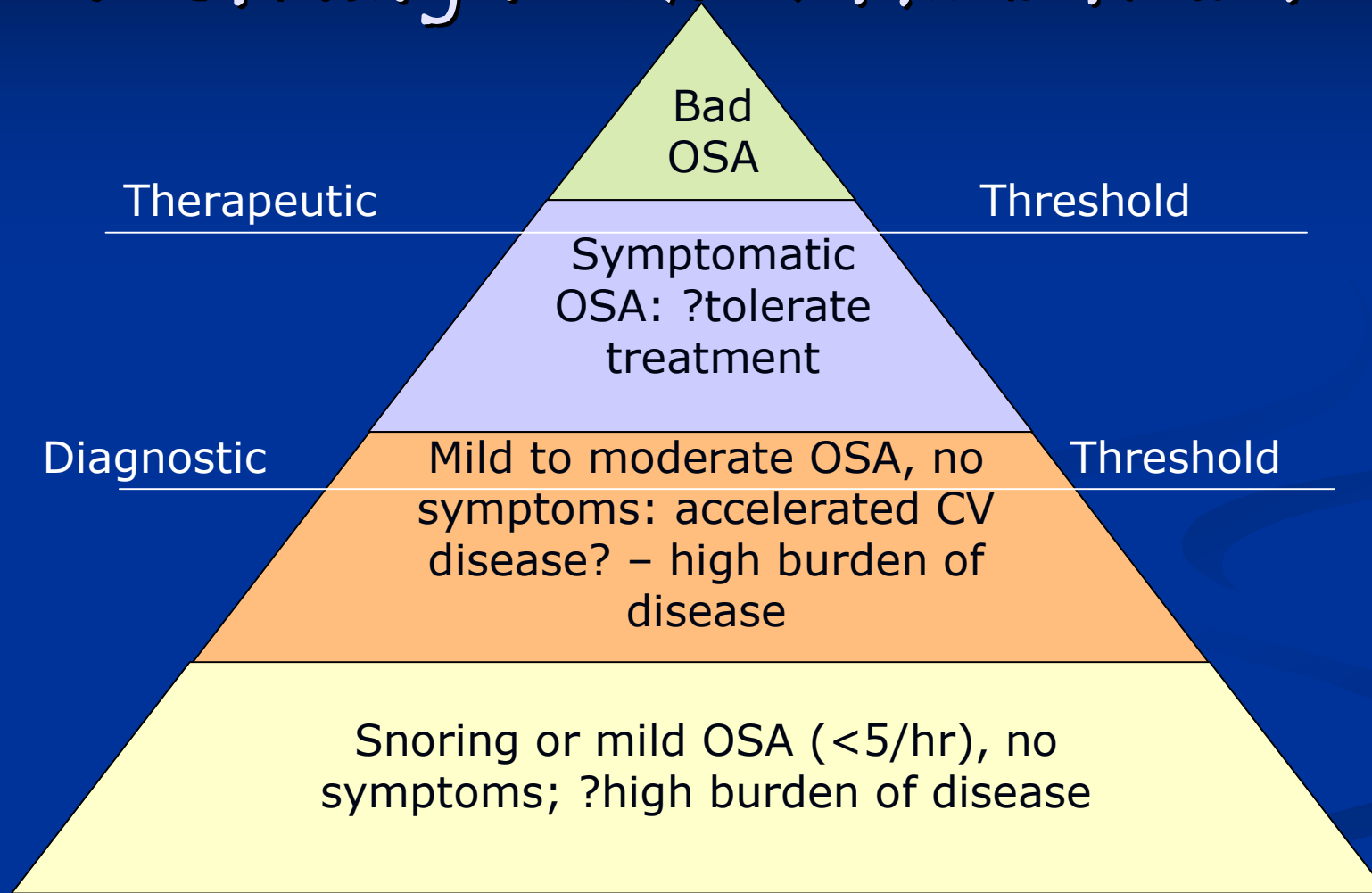
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4% O₂ Desaturations / Hour

- Random sample from electoral roll, 30-60 years
- 169 Maori, 195 non-Maori
- Overnight MESAM4 monitoring at home



The iceberg of sleep disordered breathing (?20% of adults at risk)



Relative numbers of affected individuals

Hint



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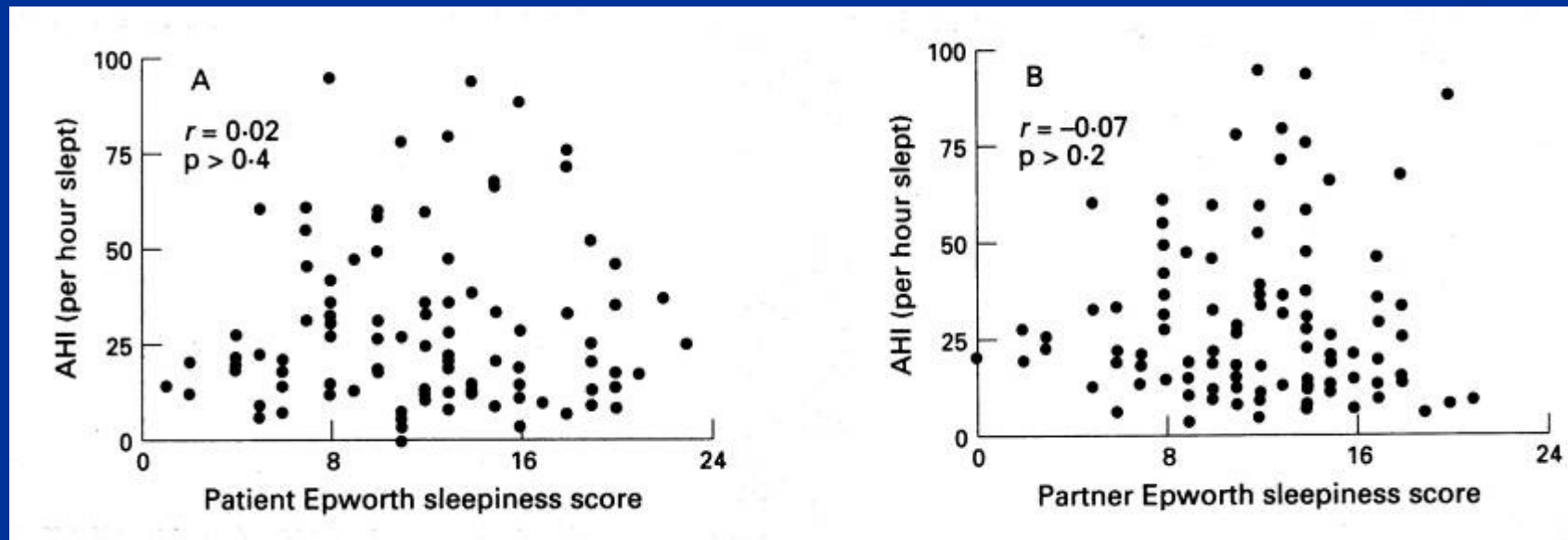
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Correlation between Sleep Study indices (AHI) and symptoms (ESS), both patient and partner.

Kingshott et al Thorax 1995;50:994

103 OSA patients and their wives. Differences between patient and partner assessment but neither correlated with AHI



Berlin questionnaire (arose out of a conference in Berlin in 1996)

Netzer et al, *Ann Int Med* 1999;131:485

Based on questions (snoring, sleepiness etc), risk factors (age, weight sex, neck etc) and presence of hypertension.

744/1008 questionnaires returned (Cleveland, Ohio)
100 portable sleep studies (Eden Tec, threshold RDI > 5/hr)

37.5% classified as high risk (n=279)

If placed in High risk

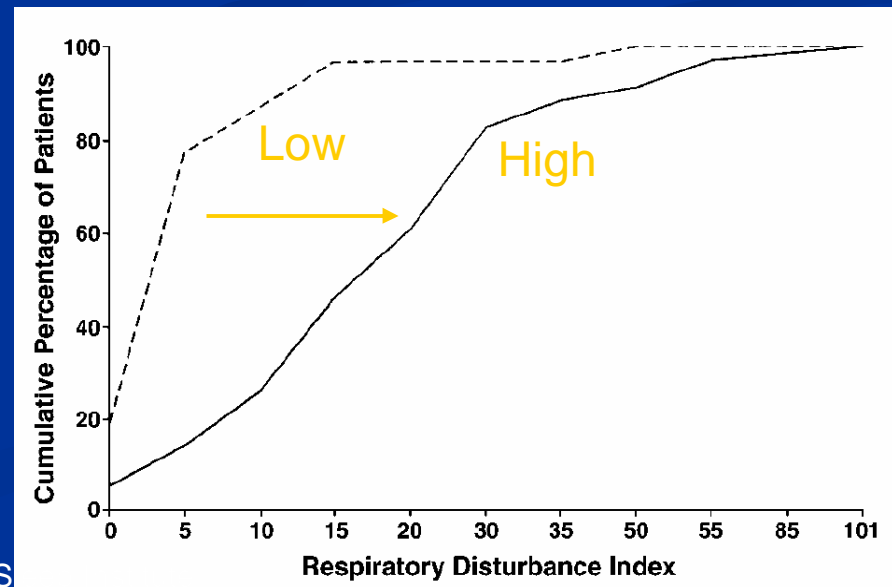
31% >15/hr, 86% >5hr

If placed in Low risk

3% >15/hr, 23% <5/hr (false -ves)

Overall prevalences very high!
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Tsai et al (Remmers, Flemons) AJRCCM 2003;167:1427-32

A decision rule for diagnostic testing on OSA.

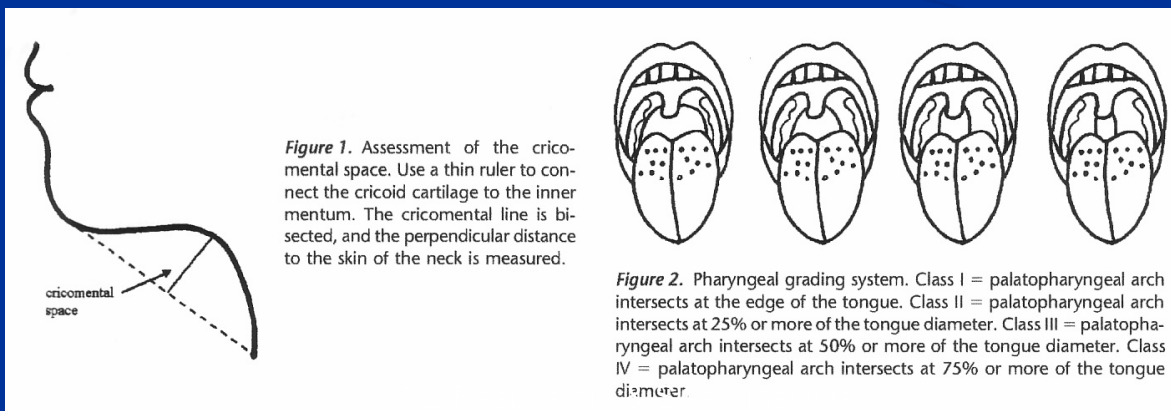
75 patients referred to a predominantly OSA service

RDI cut off of 10 chosen, 48% had OSA

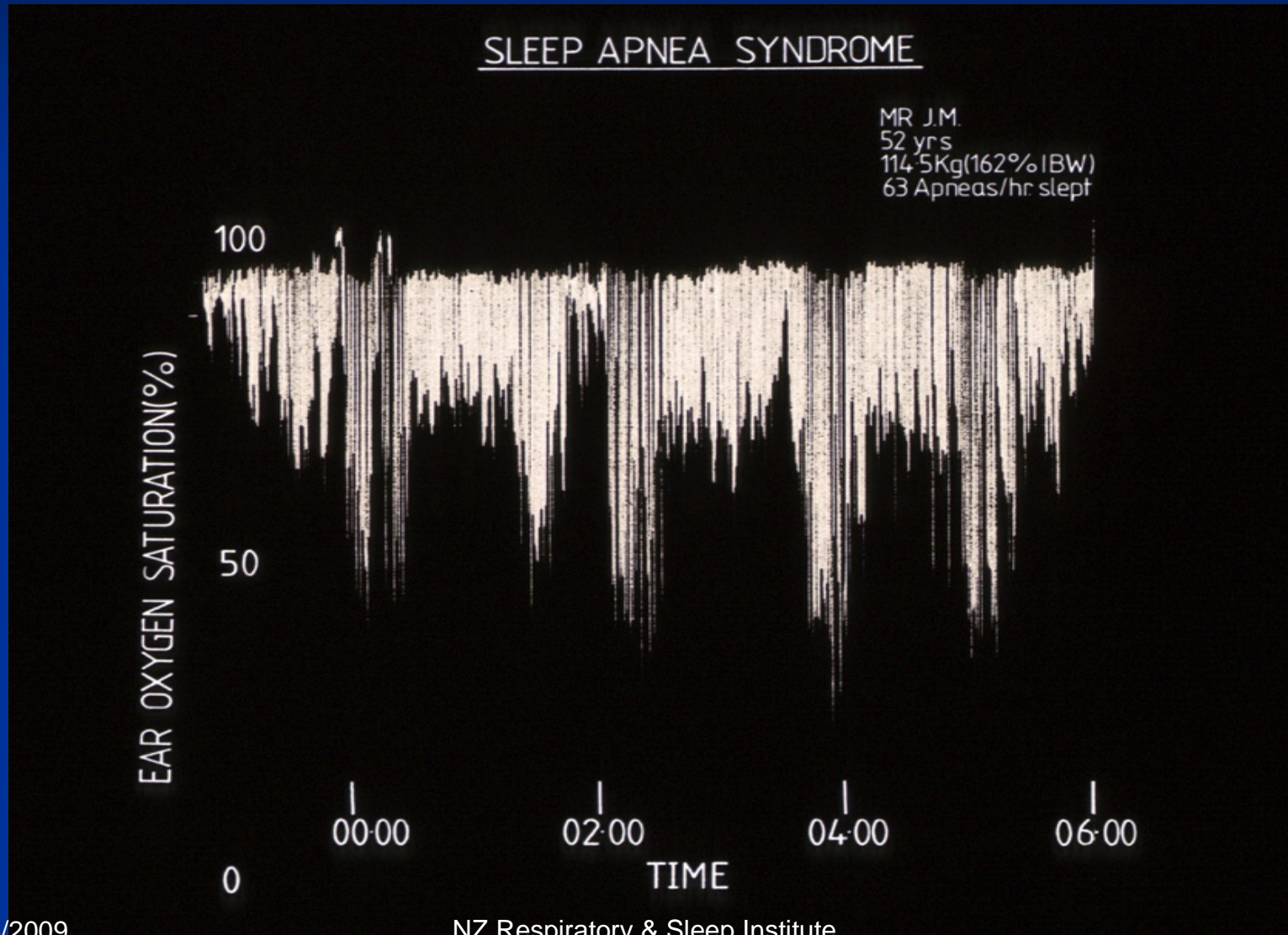
Age, snoring, witnessed apnoeas, hypertension

Physical examination:-

BMI, neck circumference, mandibular protrusion, thyro-rami distance, sterno-mental distance, thyro-mental displacement, crico-mental space, pharyngeal grade, palatal position, tonsillar size and overbite.



Typical symptoms & oximetry



The role of oximetry

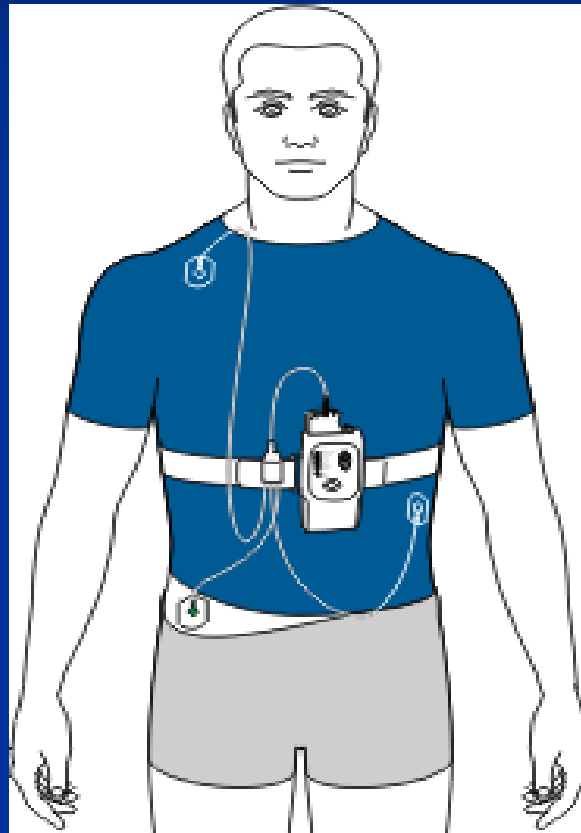
■ Evidence?

- Misses at least one third of OSA patients (Douglas et al, Lancet 2002);
- Underestimates RDI by 48% (Jobin et al, Thorax 2007)

■ Pitfalls?

- ill general medical patients are often sleepy due to their illness and if they snore in the ward then oximetry may mislead as many reasons to desaturate e.g. COPD.
- desaturation reflects many variables in addition to length of apnoea;
- repetitive apnoeas are seen in CHF (40% of CHF patients with ejection fraction <40% will have periodic breathing);

Embletta Partial Study: Respiratory Variables only

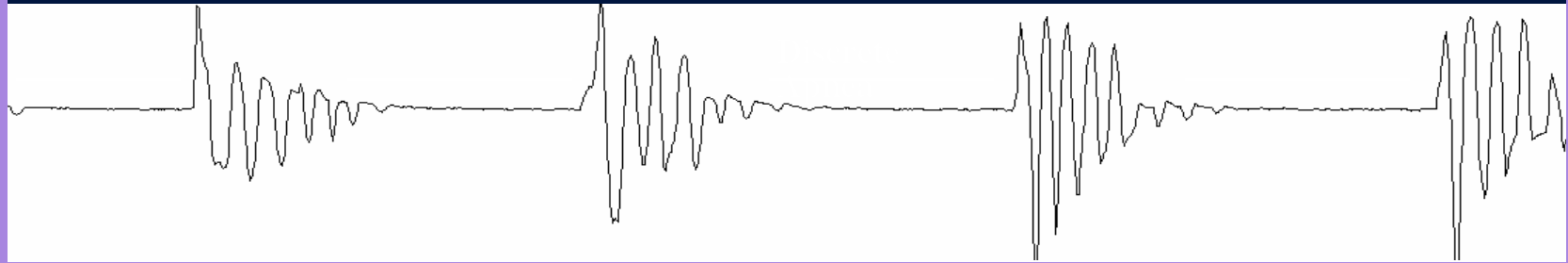


Detects:

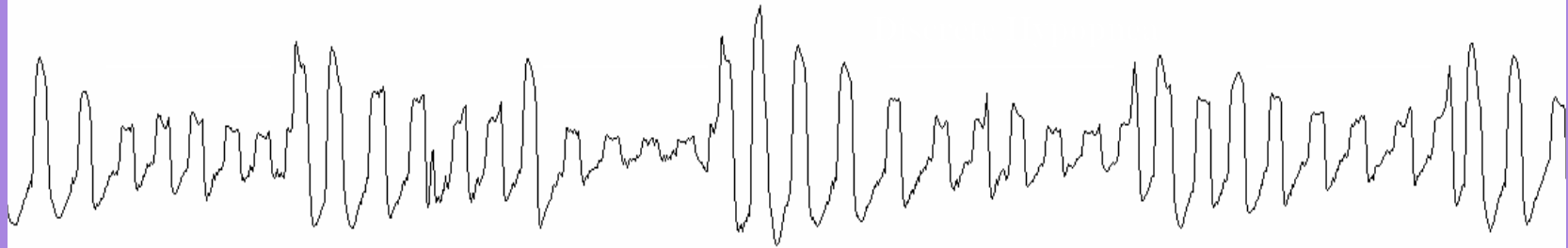
- Oximetry
- Respiratory effort
- Flow
- Position
- Movement
- ECG

Spectrum of Event Severity

Flow

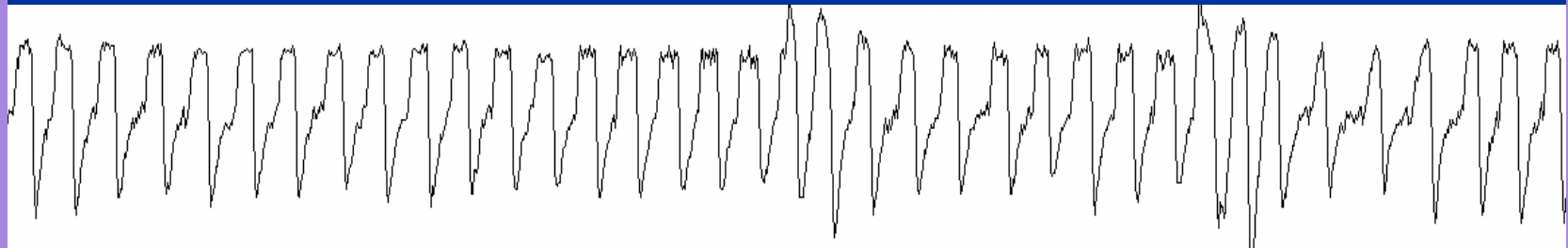


Flow

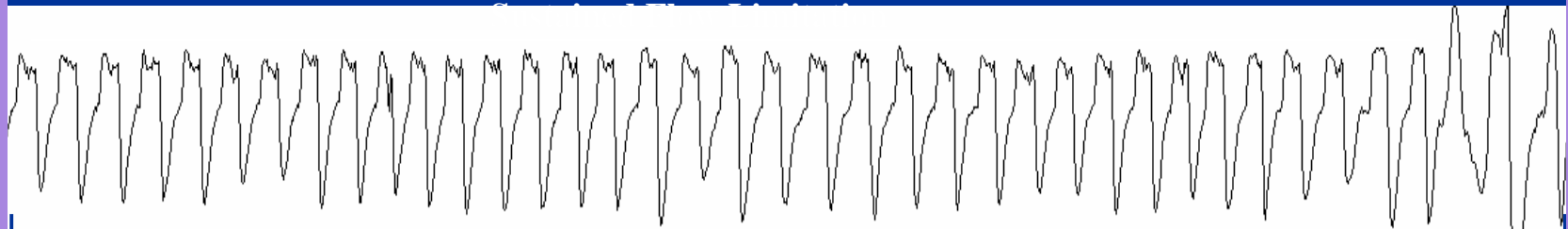


Discrete

Flow



Flow



Full Polysomnography: Gold standard

- Its use is partially historical accident;
- No test has been shown to be better therefore it is gold standard by default;
- It is not a perfect test and has limitations:
 - Inability to detect micro-arousals reliably
 - R & K scoring is a crude tool (20 sec epochs)
 - Significance of flow limitation

Whitelaw et al, Calgary, Canada (AJRCCM 2005;171:188-93)

- 308 pts with ?OSA randomised to PSG or home oximetry
- Seen in clinic and probability of responding to CPAP estimated

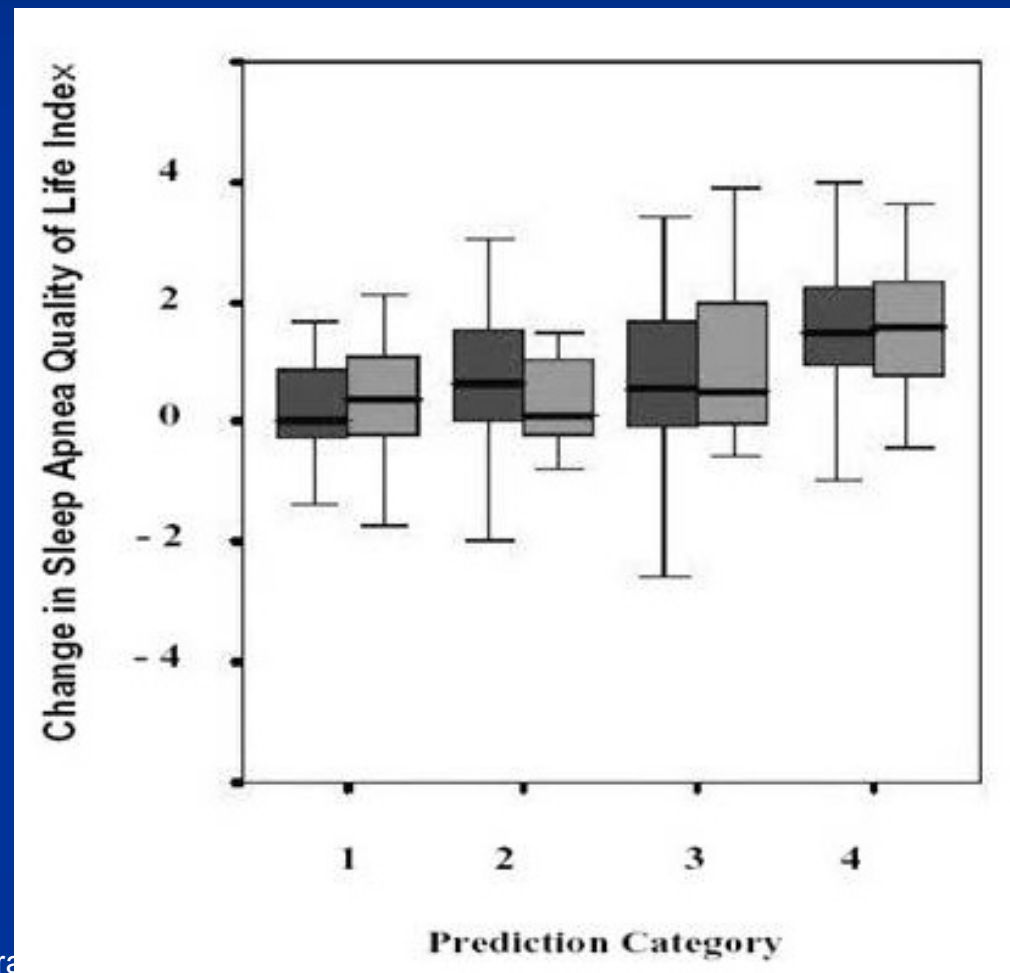
1 = <25%, 2 = 25-50%

3 = 50-75%, 4 = >75%

Response to CPAP assessed by
change in SAQLI

Was PSG superior to oximetry?

NO DIFFERENCE



Pale = PSG Dark =
Oximetry

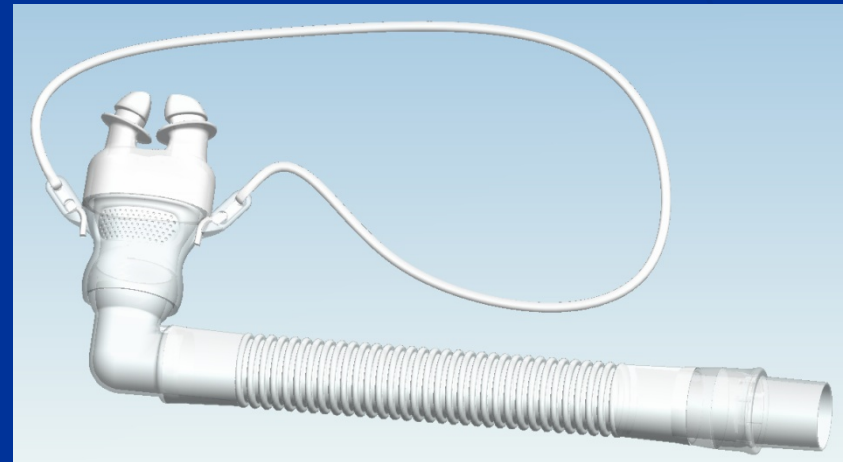
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F&P HC600



F&P Interfaces



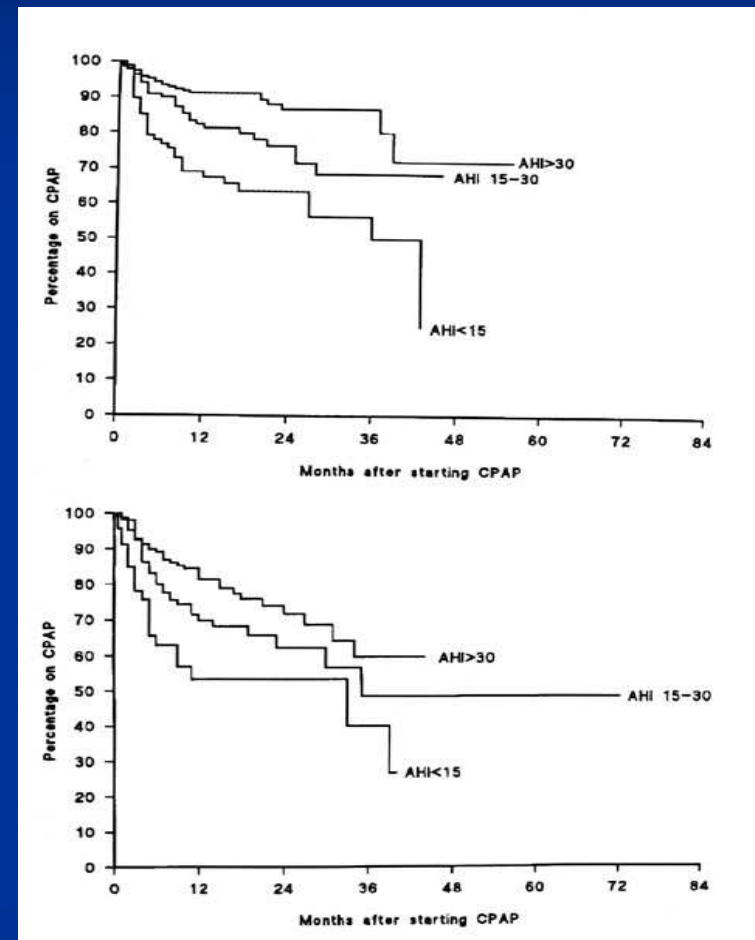
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Who complies with CPAP therapy long term?

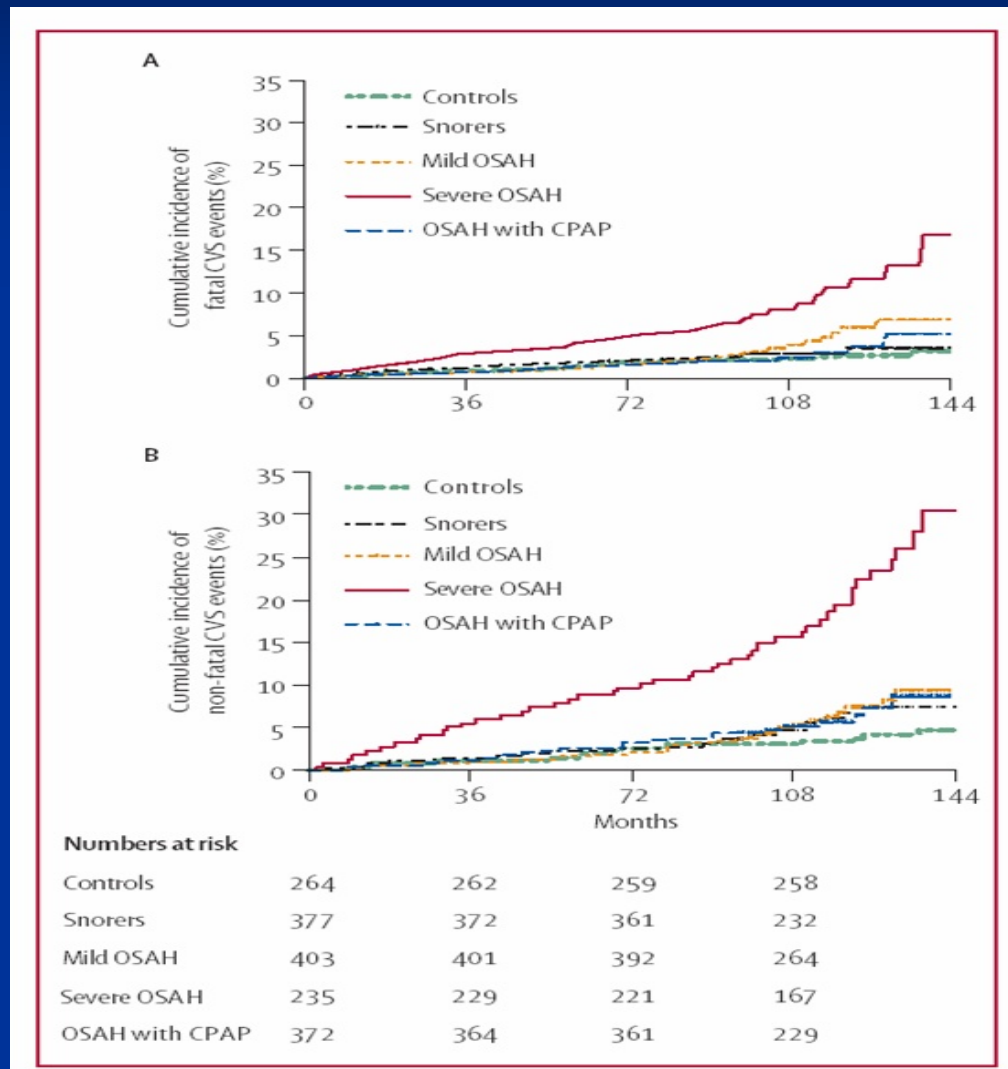
ESS > 10

- Significant daytime sleepiness – ESS > 10/24;
- Those who have sought treatment voluntarily!
- Those with severe OSA; *McArdle et al, AJRCCM 1999;159:1108*



Why are we under pressure to tx?

Marin J et al, Lancet 2005, 365:1046



- Untreated OSA associated with dramatic increase in CVS events both fatal and non-fatal;
- CPAP treatment appears to reduce the risk to near normal;
- Not randomised, observational study

Mandibular Advancement (lateral CBCT)

Neutral



Advanced



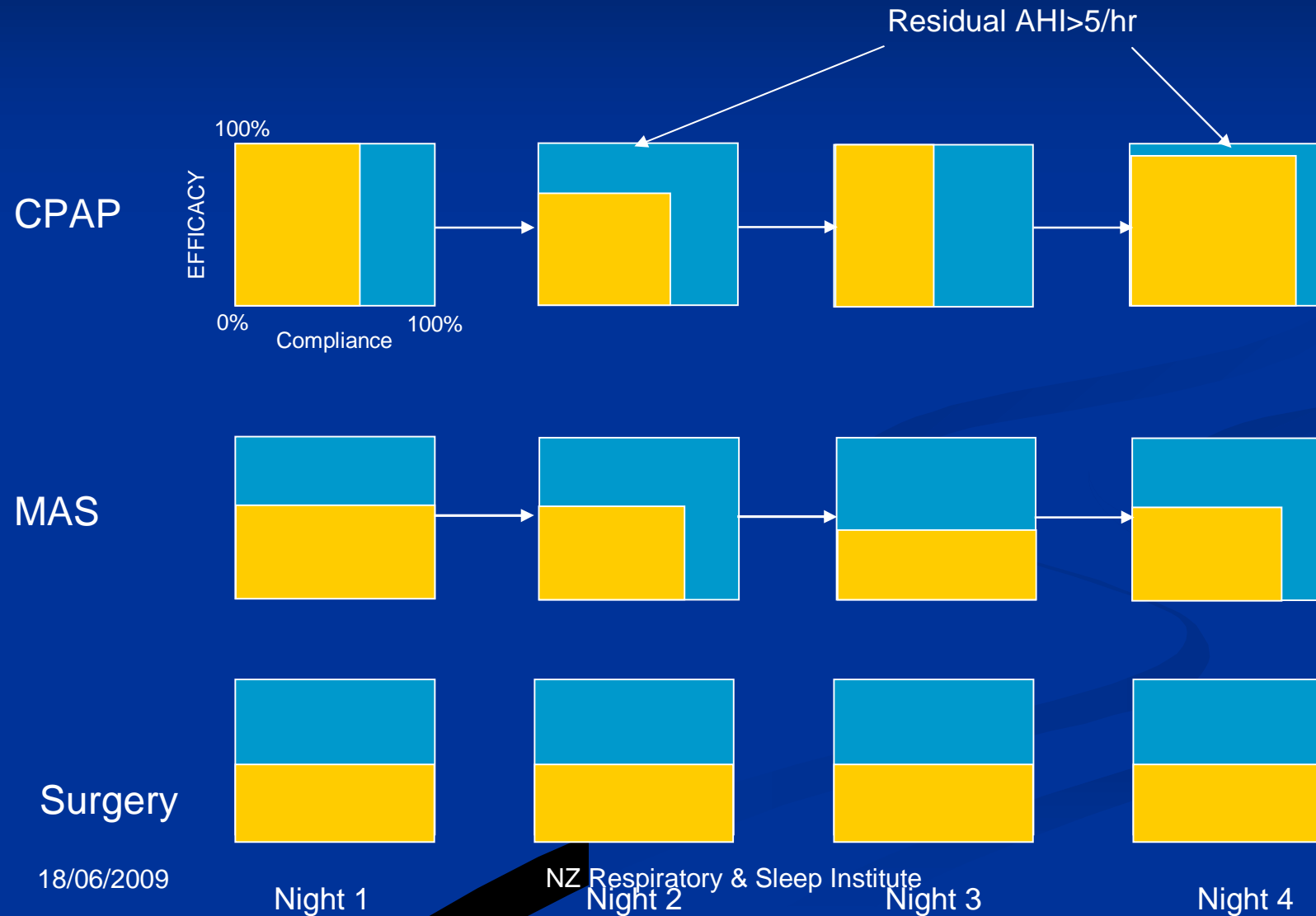
Somnodontics Appliances



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Clinical Effectiveness in the Real World



Harm



Severity

Test selection (Medico-legal)

- 45 yr old truck driver
 - Referred because of observed sleepiness on job.
 - ESS 2/24
 - Partial sleep study Oxygen desaturation 2/Hr
 - Returned to driving
 - Killed a family of 5 Two weeks later

- DID NOT SLEEP on study night

Test Selection – Co-morbid conditions

- 62 year QC
- ESS 17/24
- RDI 45
- Intolerant to CPAP (Autoset)

- EF 22%
- PSG Complex CSA
- Fine on Servo Ventilator

Test Selection (Other sleep disorder)

- 45 year old professional
- Heavy snorer occasional witnessed apnoeas
- ODI 3
- Trial of CPAP advised
- No benefit
- Self referred for opinion
- Narcolepsy

What are we treating?

- 55 yr old Chinese man – BMI 23
- Heavy snorer witnessed apnoea
- RDI 69: min saturation 72%
- CPAP trial great
- Wanted surgery

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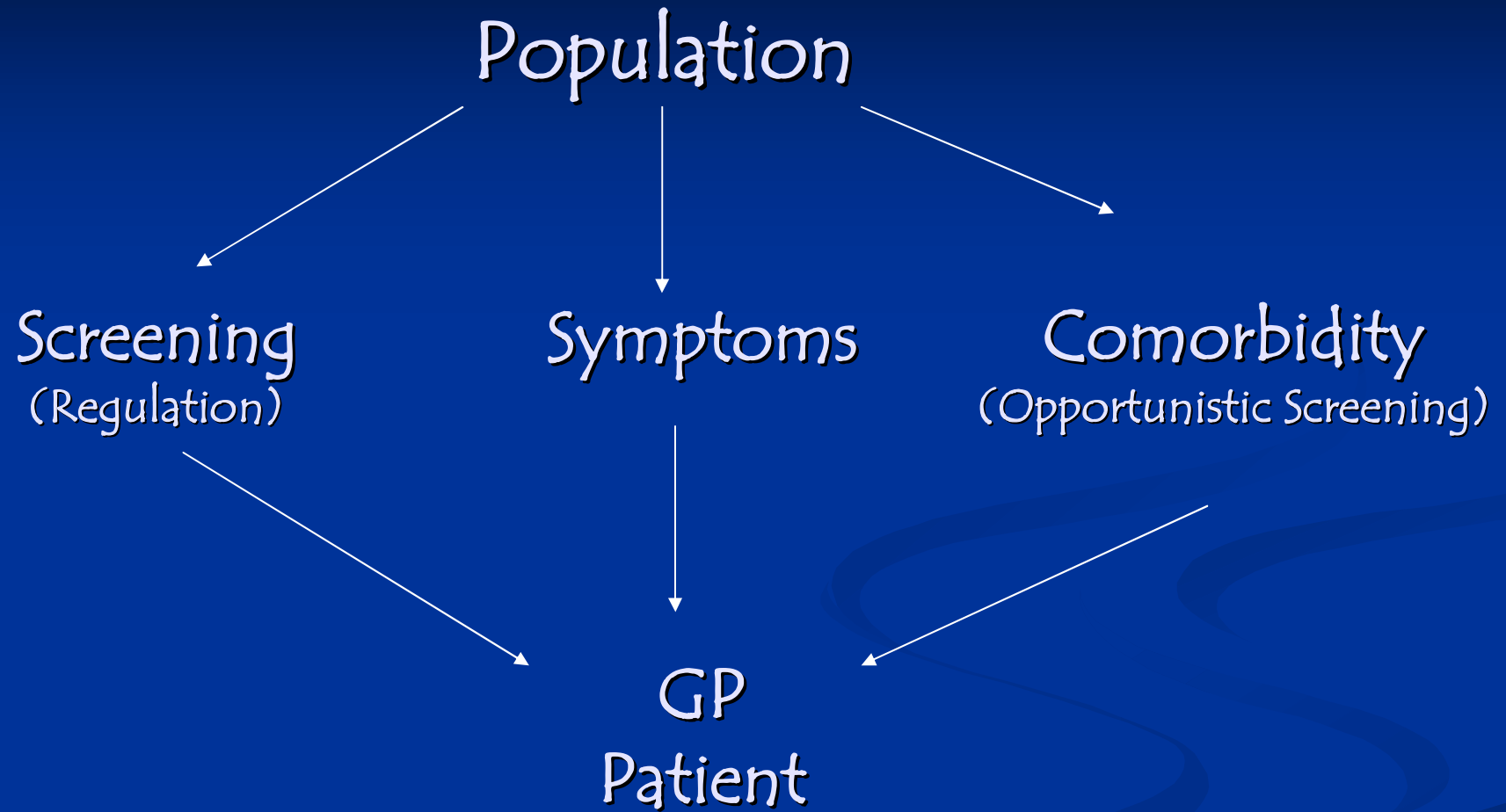
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- Heavy snorer witnessed apnoea
- RDI 69: min saturation 72%
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- Snoring no sleepiness wife nearly happy
- RDI 40: min Saturation 75%
- Tongue coblation
- No snoring no sleepiness wife happy

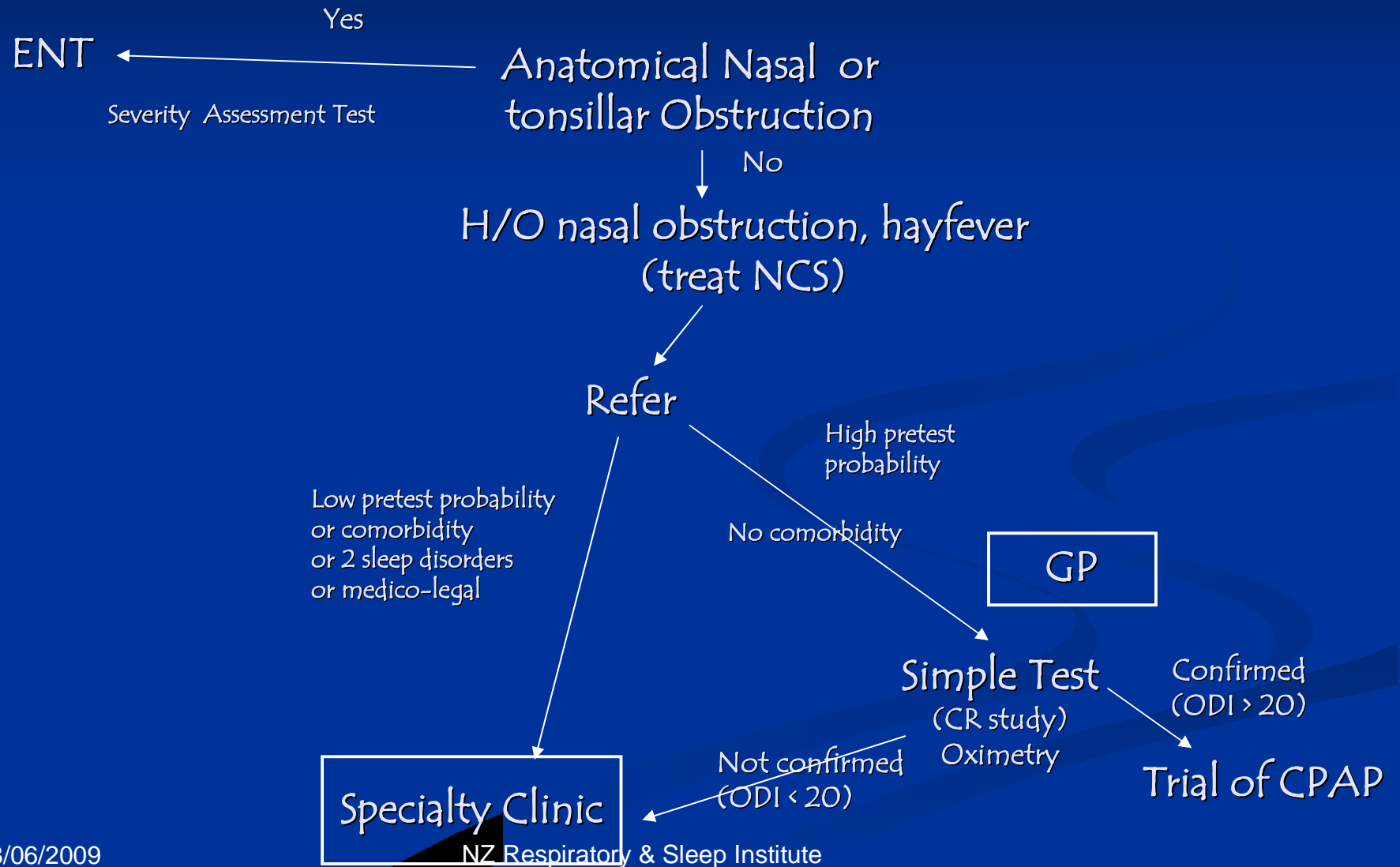
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- RDI 37: min saturation 78%



(Structured H & Ex)

GP History & Examination



Specialist Clinic

Medico-legal
Comorbidity
2 sleep disorders
Failed other tests

PSG

Probable OSA

CardioResp Test

not confirmed

confirmed

PSG

Trial of CPAP

CPAP

Bad Co-morbidities
CSA or OHS
Manual Titration

No Comorbidities

Autoset

then / or

Single Pressure CPAP

Not tolerated

ENT

Dental

(Patient pref)

Tolerated but problems

ENT referral to
optimise airway

Tolerated well

GP FU

FU Sleep Study

Sleep Service FU

Sleep Service
Access