

Assessment and Management of Sleep Disorders

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Disclosure

Thoracic, CF & Sleep Physician – The Prince Charles Hospital

Metro North
Health



Queensland
Government



THE UNIVERSITY
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AUSTRALIA



THE COMMON GOOD
THE PRINCE CHARLES HOSPITAL FOUNDATION



Outline

- Overview of “normal” sleep
- OSA epidemiology & pathophysiology
- Clinical features
- Diagnosis
- Treatment
- OSA and the Law
- Management & Monitoring CPAP in community
- Case: The sleepy patient



AASM: Disorders of Sleep

International Classification of Sleep Disorders III

- Insomnia
- **Sleep Related Breathing Disorders**
- Central Disorders of Hypersomnolence
- Circadian Rhythm Sleep-Wake Disorders
- Parasomnias
- Sleep Related Movement Disorders

Sleep Related Breathing Disorders

Central sleep apnoea syndromes

- Central sleep apnoea with Cheyne-Stokes breathing
- Central sleep apnoea due a medical disorder without Cheyne-Stokes breathing
- Central sleep apnoea due to high altitude periodic breathing
- Central sleep apnoea due to a medication or substance
- Primary central sleep apnoea
- Primary central sleep apnoea of infancy
- Primary central sleep apnoea of prematurity

Obstructive sleep apnoea (OSA) syndromes

Sleep-related hypoventilation disorders

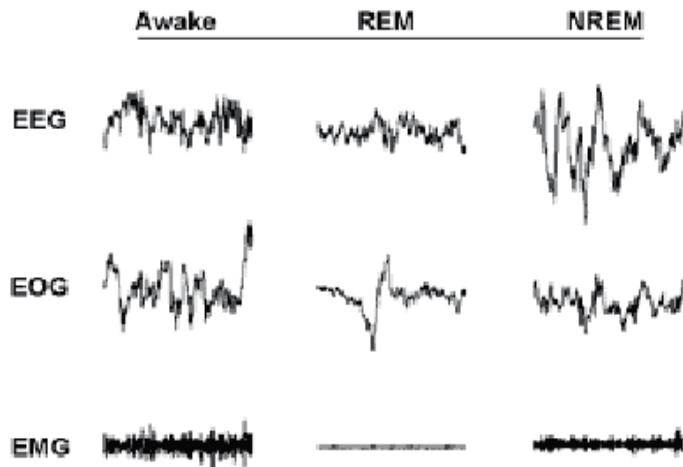
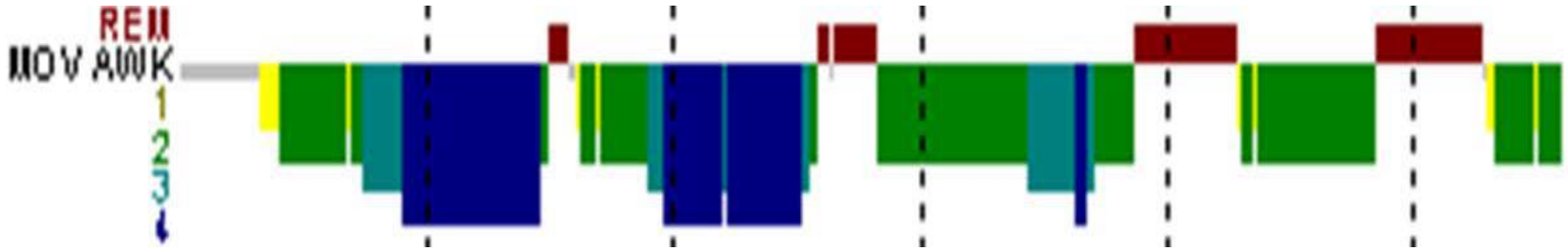
- Obesity hypoventilation syndrome
- Congenital central alveolar hypoventilation syndrome
- Late-onset central hypoventilation with hypothalamic dysfunction
- Idiopathic central alveolar hypoventilation
- Sleep-related hypoventilation due to a medication or substance
- Sleep-related hypoventilation due to a medical disorder
- Sleep-related hypoxemia disorder

Isolated symptoms and normal variants

- Snoring
- Catathrenia



Normal Sleep Pattern



SLEEP PARALYSIS 2012.

REM Sleep

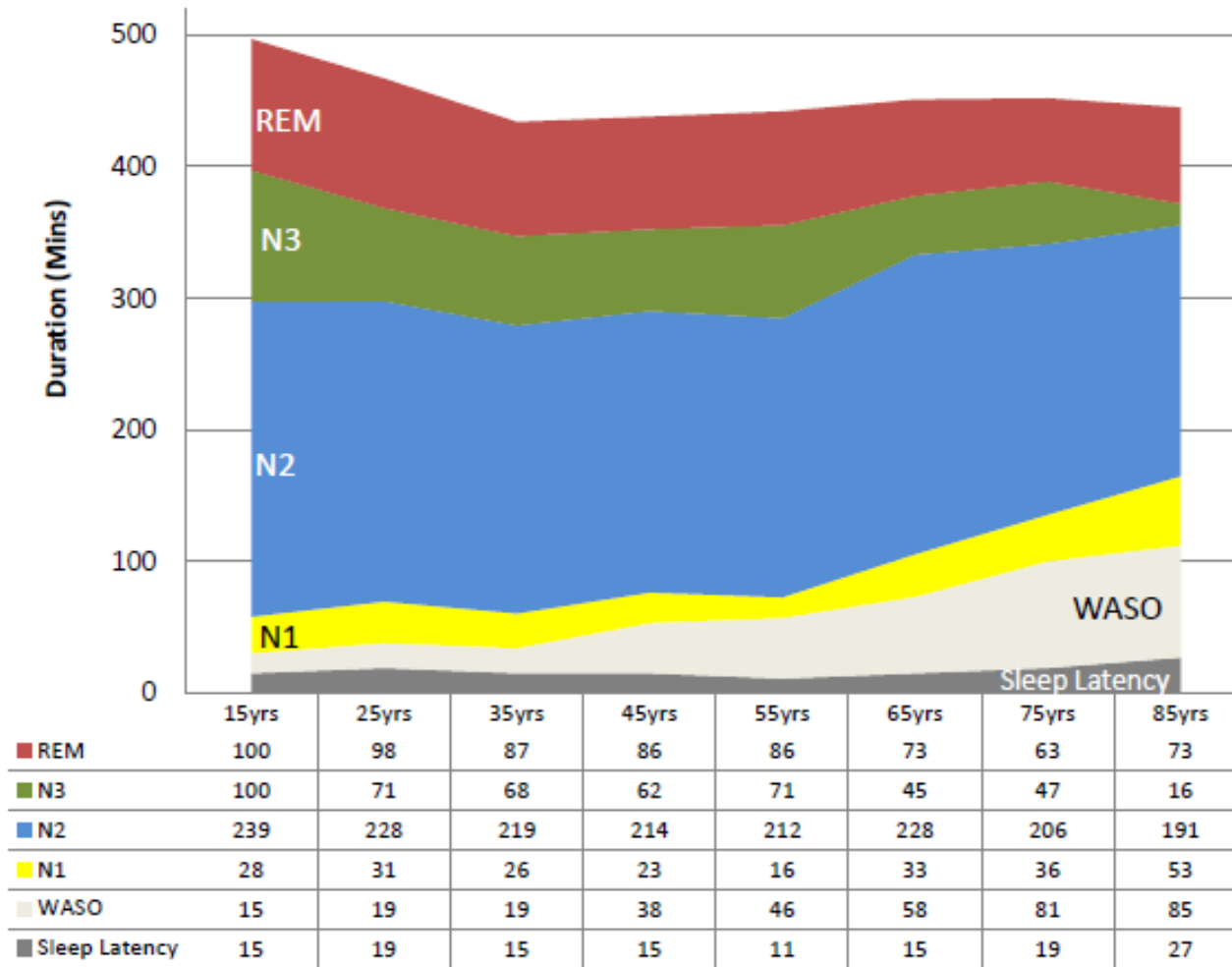
- ✓ High frequency, low amplitude EEG pattern (may resemble wakefulness)
- ✓ Muscle atonia (except diaphragm, external ocular muscles)

Non-REM Sleep

- ✓ Mixed (lower frequency) frequency EEG activity
- ✓ Divided into N1 / N2 / N3 (progressively “deeper” sleep)



Normal Sleep Stages in Adults

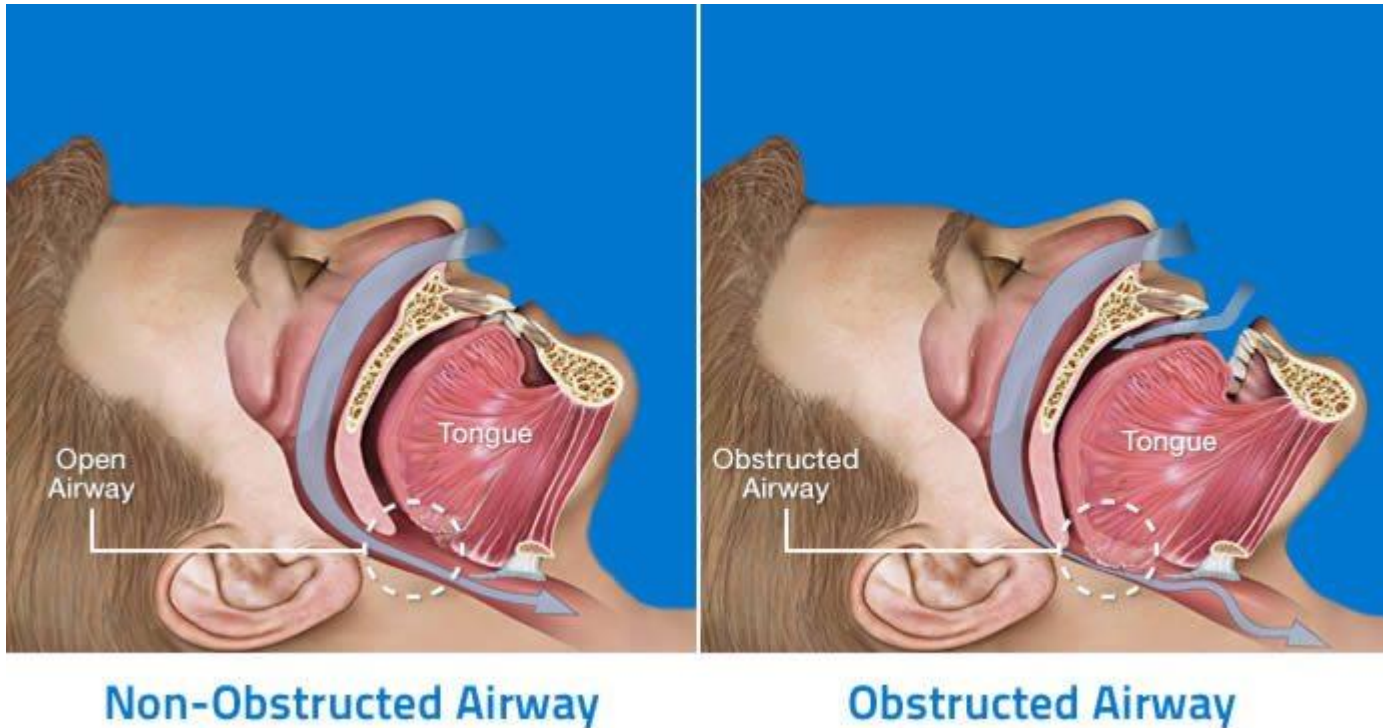


Ohayon et al *Sleep* 2004



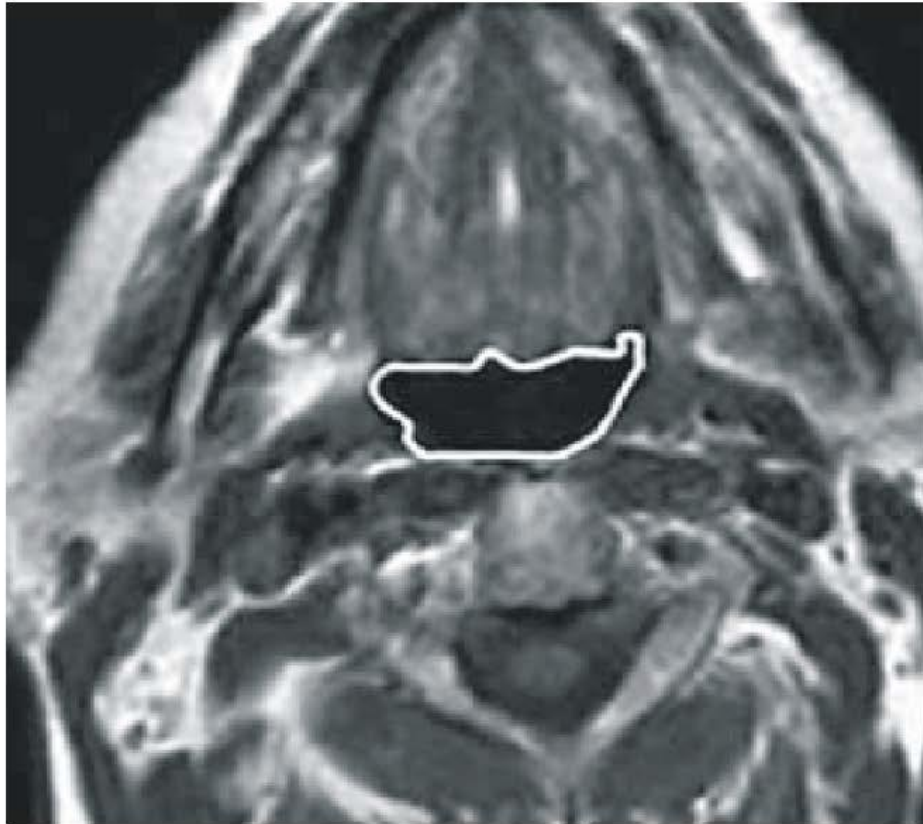
OSA Definition

Cessation (apnoea) or partial (hypopnoea) cessation of airflow during sleep due to intermittent upper airway obstruction

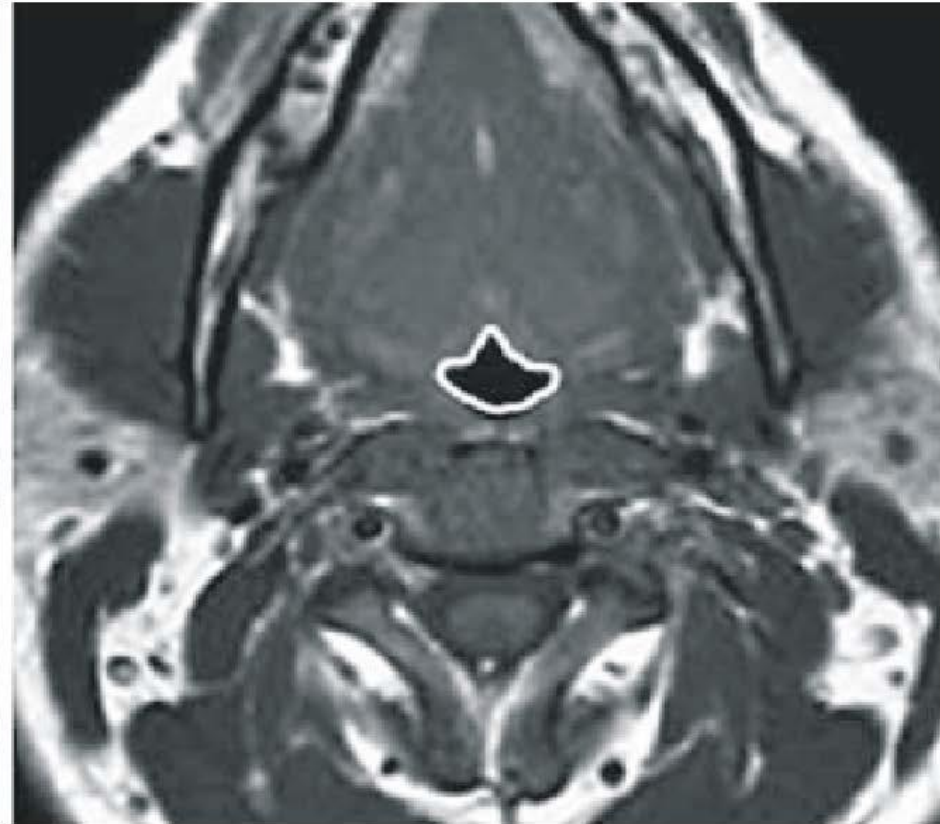


Upper airway dimensions are reduced in OSA

Normal Airway



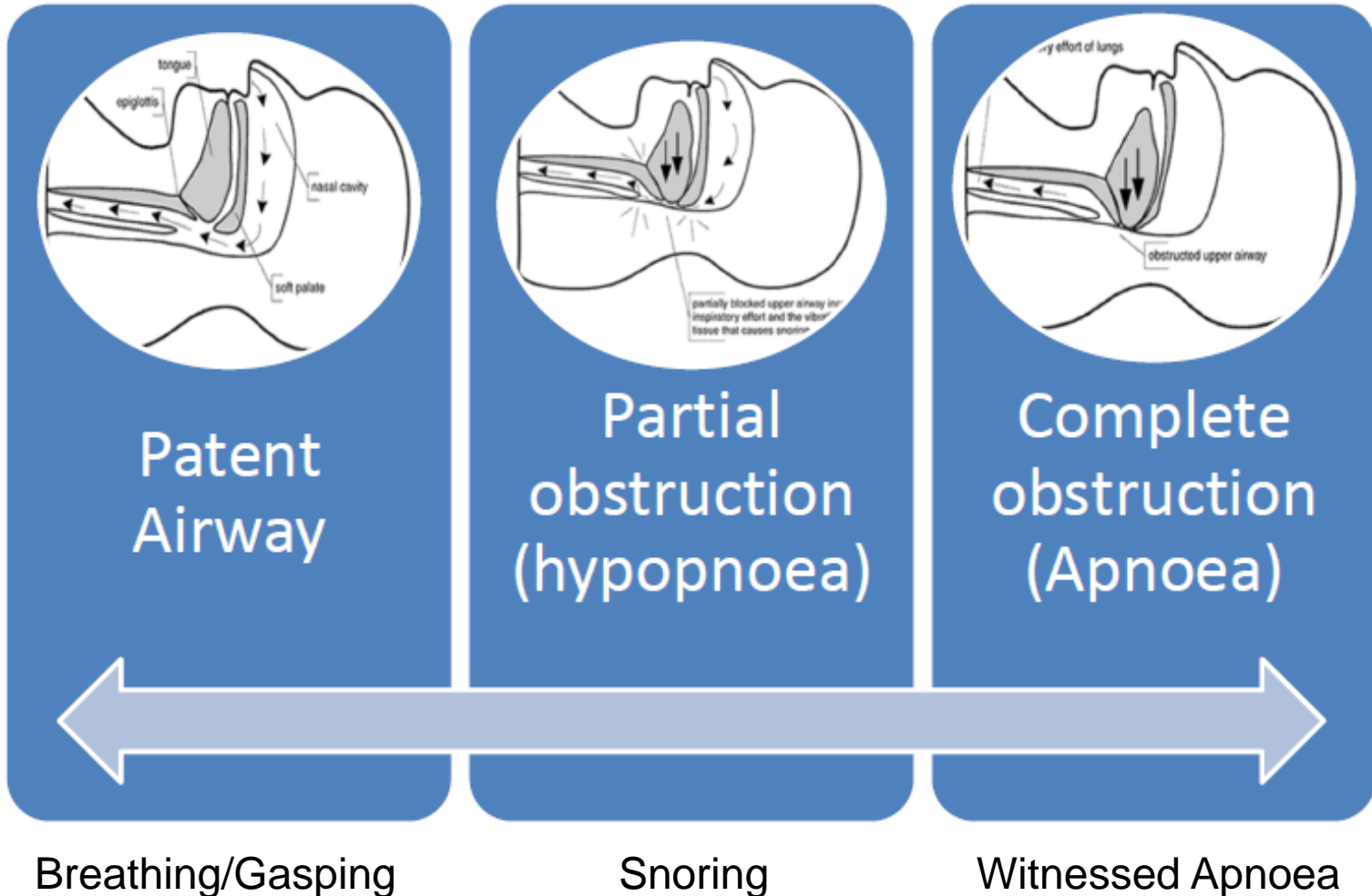
OSA Patient Airway



Hora et al Respiration 2007



Spectrum of upper airway patency



Breathing/Gasping

Snoring

Witnessed Apnoea



Epidemiology

1993 US data: 4% middle aged men, 2% middle aged women

Young T. N EngJ Med 1993

2010 Australian data:

Table 1.1: Estimated prevalence of moderate-severe OSA in Australia, 2010

Age Group	Women		Men		Persons	
	%	No.	%	No.	%	No.
20-44	0.6	22,775	3.3	126,317	1.6	149,092
45-64	1.9	53,706	10.3	287,186	5.3	340,892
65+	6.7	108,929	12.6	175,677	10.2	284,606
Total	2.2	185,410	7.2	589,181	4.7	774,591

Note: The age breakdown was derived based on the results from Bixler et al (1998; 2001). OSA is defined as being an $AHI \geq 15$.

Source: Deloitte Access Economics calculations.

Re-awakening Australia. Deloitte Economics 2010



Risk Factors

- Male Gender
- Age
- Obesity
- Craniofacial abnormalities
- Race



Pathophysiology

Anatomical Traits

- narrow, collapsible airway



Non-anatomical Traits

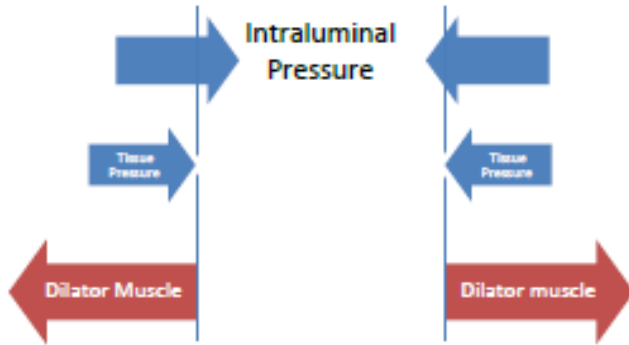
- oversensitive ventilatory control system
- low arousal threshold
- ineffective upper airway dilator muscles



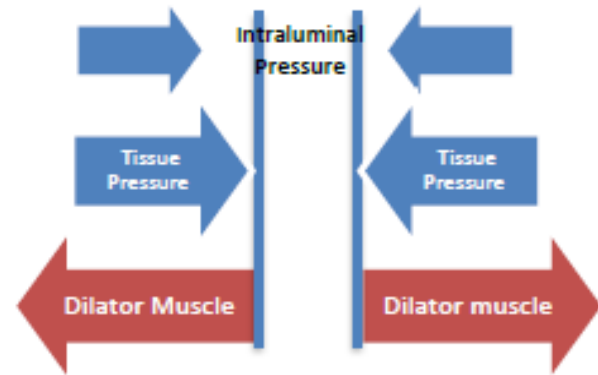
OSA

Pathophysiology (Model)

Normal Airway

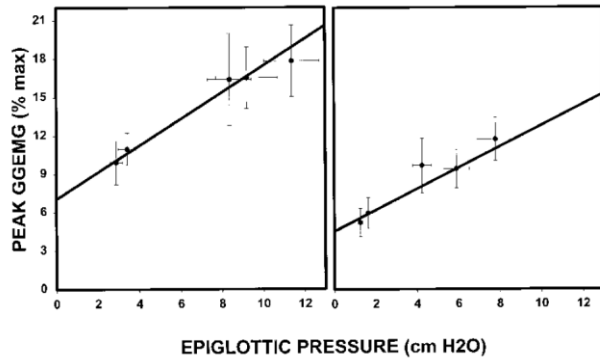


OSA Patient Airway

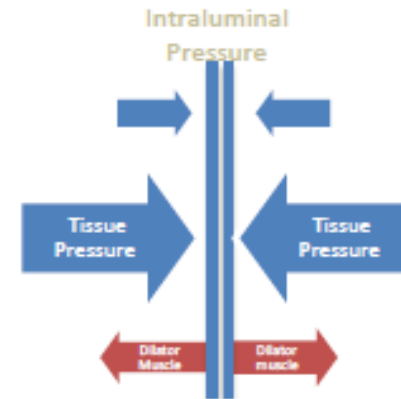


A- OSA

B- CONTROL



Sleep
 Forces maintaining airway patency are exceeded by closing forces



GGEMG = Genioglossus Electromyography
 Fogel et al *Am J Respir Crit Care Med* 2001



Symptoms

Patient perspective

- Choking arousal
- Sleep disruption and unrefreshing sleep
- Embarrassment
- Neuro-cognitive impairment
 - Executive function
 - Memory (especially short term memory)
 - Mood
 - Irritability
- Driving concerns

Partner perspective

- Witnessed apnoea
- Loud snoring

Medical Complications – Downstream Sequelae



OSA50 and STOPBANG

	<u>If yes, SCORE</u>
<u>Obesity</u> : Waist circumference* - Males >102cm or Females >88cm	3
<u>Snoring</u> : Has your snoring ever bothered other people?	3
<u>Apneas</u> : Has anyone noticed that you stop breathing during your sleep?	2
<u>50</u> : Are you aged 50 years or over?	2
TOTAL SCORE: / 10 points	

OSA50 >5

* Waist circumference to be measured at the level of the umbilicus.

▶ STOP Questionnaire

- Snoring
- Tiredness
- Observed you stop breathing
- Blood Pressure

▶ BANG

- BMI >35
- Age >50
- Neck circumference >40 cm (>15.7")
- Gender male

STOP BANG >3

Epworth Sleepiness Scale

How likely are you to doze off or fall asleep in the following situations? You should rate your chances of dozing off, not just feeling tired. Even if you have not done some of these things recently try to determine how they would have affected you.

For each situation, decide whether or not you would have:

No chance of dozing	=0
Slight chance of dozing	=1
Moderate chance of dozing	=2
High chance of dozing	=3

- Sitting and reading
- Watching TV
- Sitting inactive in a public place (e.g., a theatre or a meeting)
- As a passenger in a car for an hour without a break
- Lying down to rest in the afternoon when circumstances permit
- Sitting and talking to someone
- Sitting quietly after a lunch without alcohol
- In a car, while stopped for a few minutes in traffic

Normal: <10 Mild Sleepiness 10-12 Moderate Sleepiness 12-16, Severe Sleepiness >16



Driving Risk

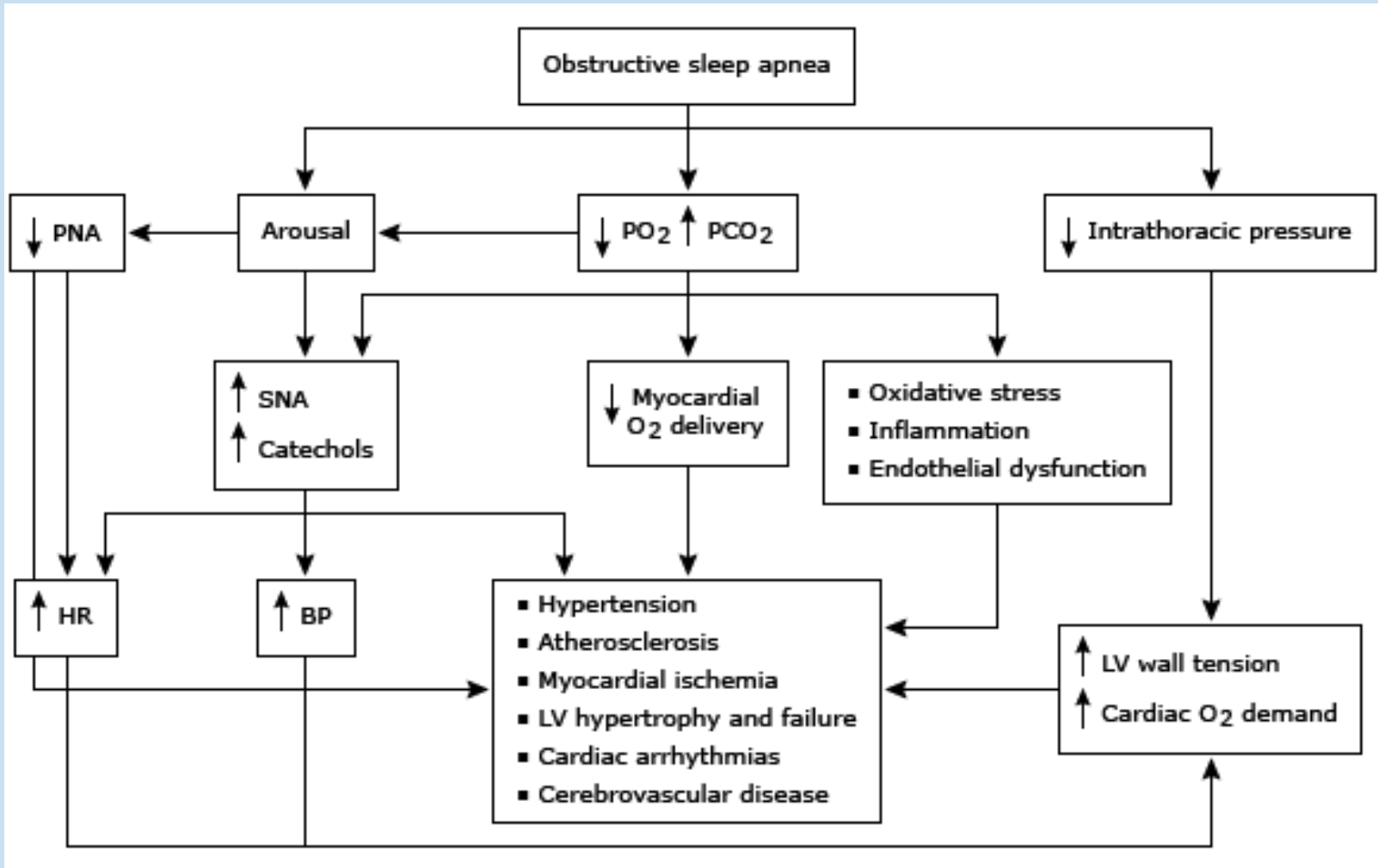
- Untreated OSA associated with 4-7 fold increased risk of MVA
- Risk of Accidents associated with
 - History of previous accident or near miss event *Powell et al Sleep 2007*
 - Severe sleepiness *Howard AJRCCM 2004*
 - Non-OSA sleep factors – time of day, duration of drive, age of driver *Connor et al BMJ 2002*

Alcohol 0.05%-0.08% x2-3

≤5hr sleep x3

Driving 2-5am x5





The Lancet - Seminar, Volume 373, Issue 9657, p82-93, January 03, 2009

[https://doi.org/10.1016/S0140-6736\(08\)61622-0](https://doi.org/10.1016/S0140-6736(08)61622-0)

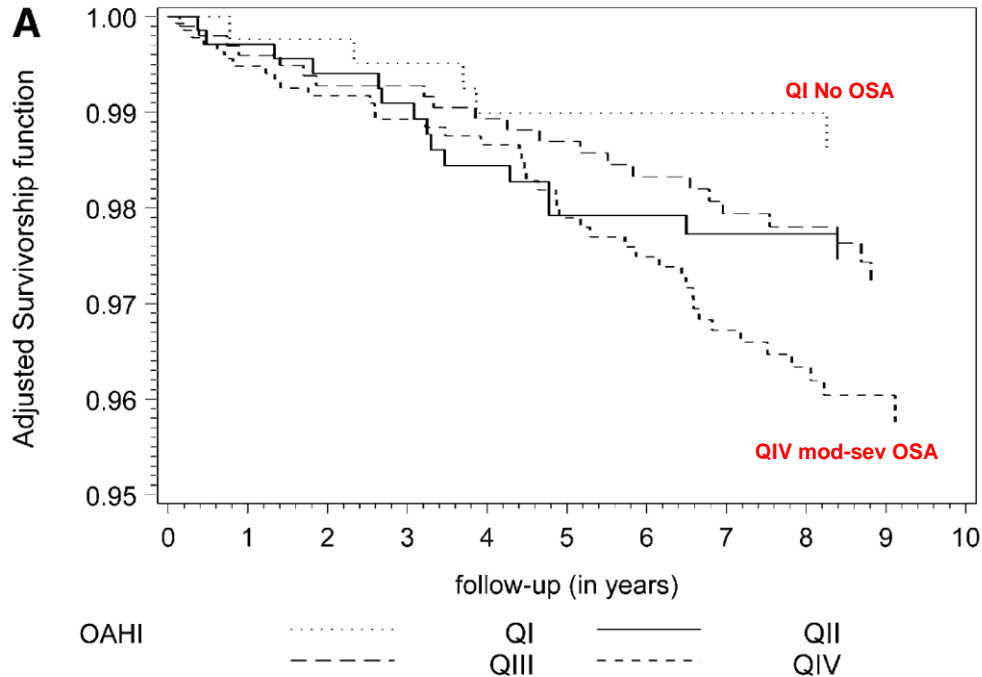
Hypertension and OSA

- Wisconsin Sleep Cohort Study
- **Dose response association between sleep disordered breathing and the presence of hypertension**

TABLE 3. ADJUSTED ODDS RATIOS FOR HYPERTENSION AT A FOLLOW-UP SLEEP STUDY, ACCORDING TO THE APNEA–HYPOPNEA INDEX AT BASE LINE.*

BASE-LINE APNEA–HYPOPNEA INDEX	ODDS RATIO, ADJUSTED FOR BASE-LINE HYPERTENSION STATUS	ODDS RATIO, ADJUSTED FOR BASE-LINE HYPERTENSION STATUS AND NONMODIFIABLE RISK FACTORS (AGE AND SEX)	ODDS RATIO, ADJUSTED FOR BASE-LINE HYPERTENSION STATUS, NONMODIFIABLE RISK FACTORS, AND HABITUS (BMI AND WAIST AND NECK CIRCUMFERENCE)	ODDS RATIO, ADJUSTED FOR BASE-LINE HYPERTENSION STATUS, NONMODIFIABLE RISK FACTORS, HABITUS, AND WEEKLY ALCOHOL AND CIGARETTE USE
	odds ratio (95% confidence interval)			
0 events/hr†	1.0	1.0	1.0	1.0
0.1–4.9 events/hr	1.66 (1.35–2.03)	1.65 (1.33–2.04)	1.42 (1.14–1.78)	1.42 (1.13–1.78)
5.0–14.9 events/hr	2.74 (1.82–4.12)	2.71 (1.78–4.14)	2.03 (1.29–3.19)	2.03 (1.29–3.17)
≥15.0 events/hr	4.54 (2.46–8.36)	4.47 (2.37–8.43)	2.89 (1.47–5.69)	2.89 (1.46–5.64)
P for trend‡	<0.001	<0.001	0.002	0.002

Stroke risk in OSA



- **Increased risk of stroke in OSA**
- **Main effect in severe OSA**
- **Comparable risk to a 10 yr increase in age or atrial fibrillation**

Covariate	Unadjusted	Age Adjusted	Fully Adjusted*
OAHI			
IV quartile (19.13 to 164.5)	3.91 (1.55–9.86)	3.05 (1.21–7.72)	2.86 (1.10–7.39)
III quartile (9.50 to <19.13)	2.35 (0.89–6.20)	1.97 (0.74–5.21)	1.86 (0.70–4.95)
II quartile (4.05 to <9.50)	1.96 (0.71–5.40)	1.86 (0.68–5.13)	1.86 (0.67–5.12)
I quartile (0 to <4.05)	1.0	1.0	1.0
<i>P</i> value for test of linear trend for AHI	0.0004	0.006	0.016

Untreated Severe OSA is Associated with Increased Cardiovascular Death and Morbidity

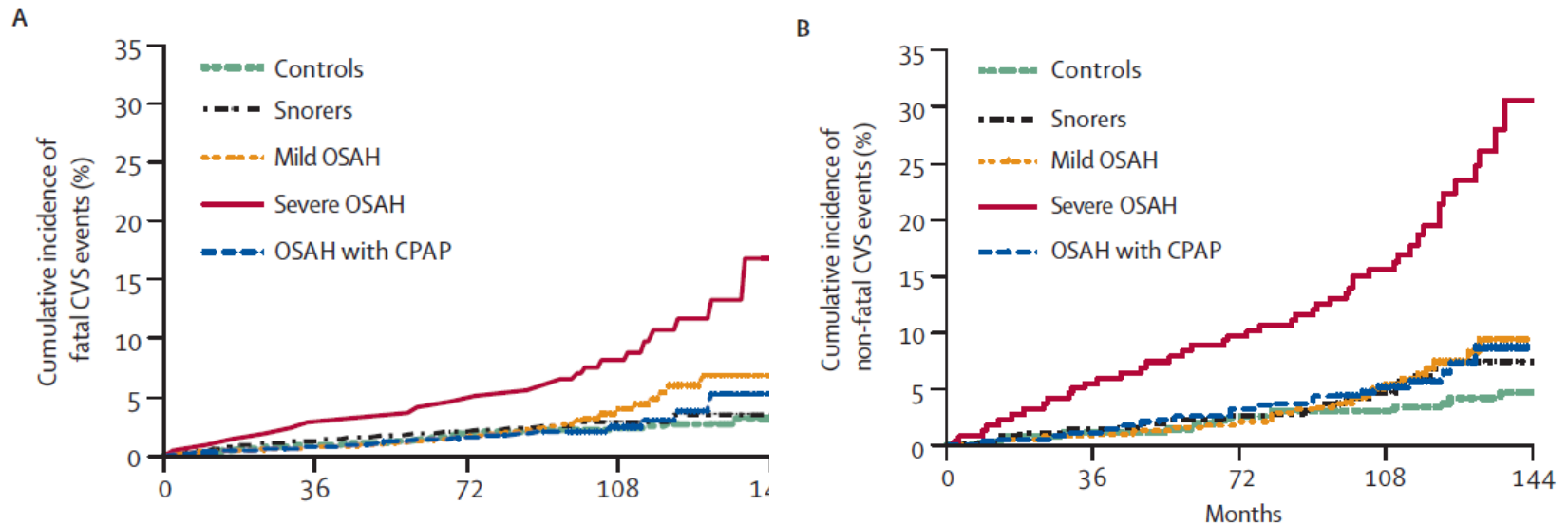
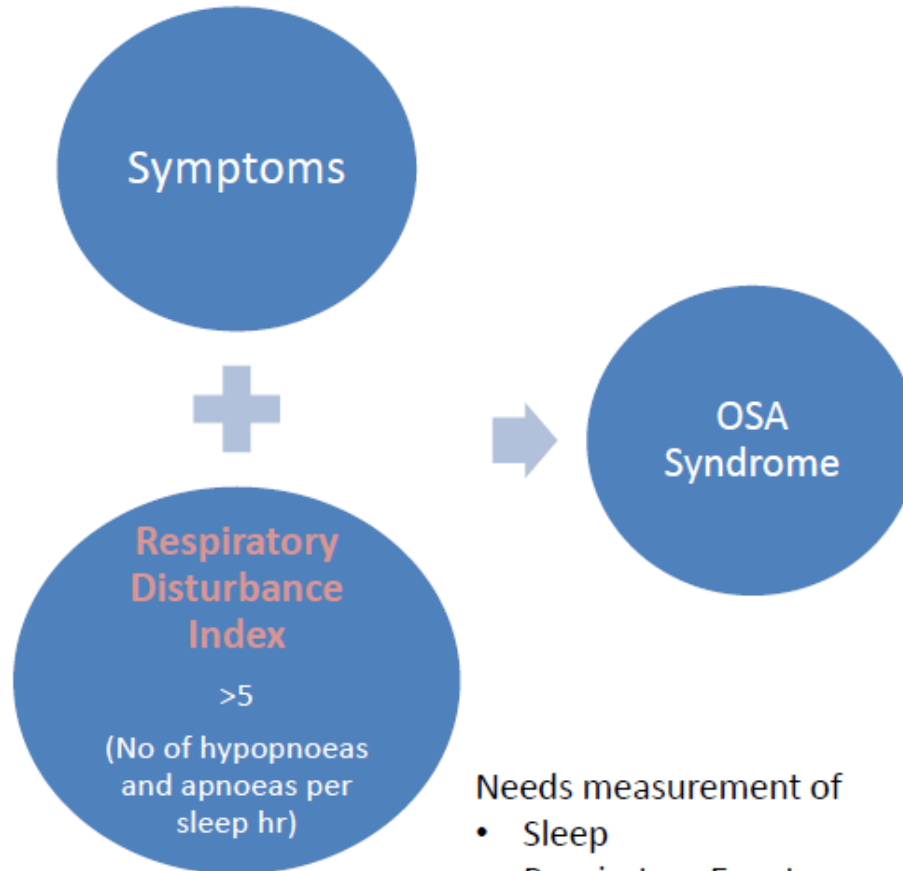


Figure 2: Cumulative percentage of individuals with new fatal (A) and non-fatal (B) cardiovascular events in each of the five groups studied

Diagnosis



Needs measurement of

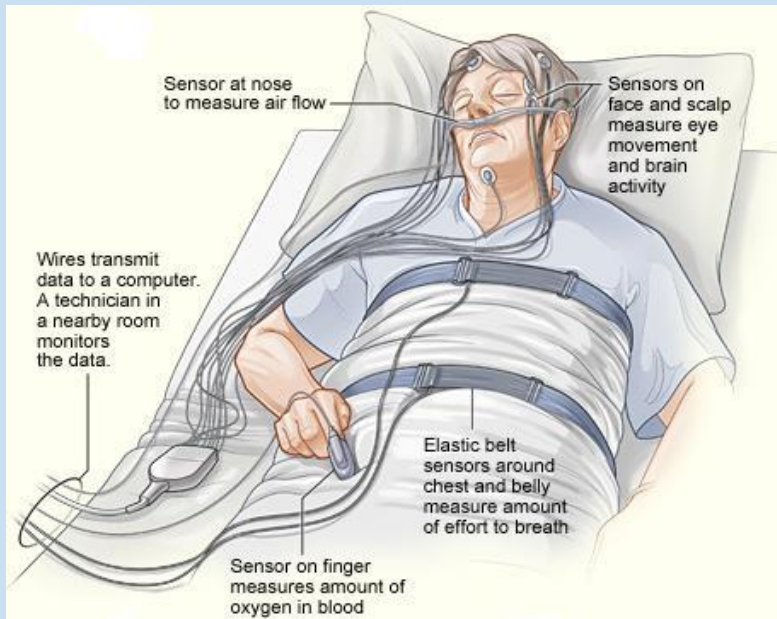
- Sleep
- Respiratory Events

AHI

Normal	<5/hr
Mild	5-14/hr
Mod	15-29/hr
Severe	≥30/hr

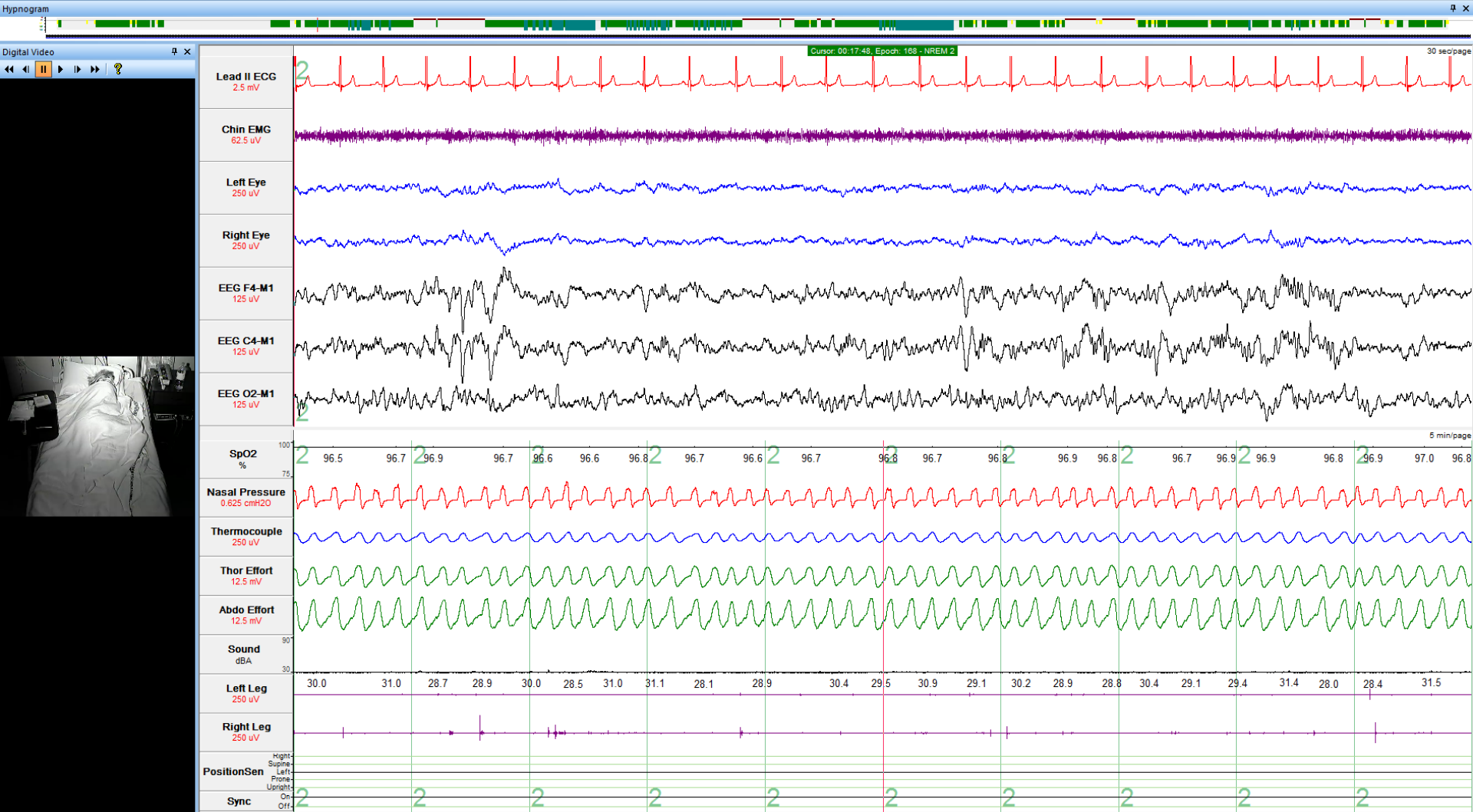


Sleep Study (Level 1 Polysomnography)

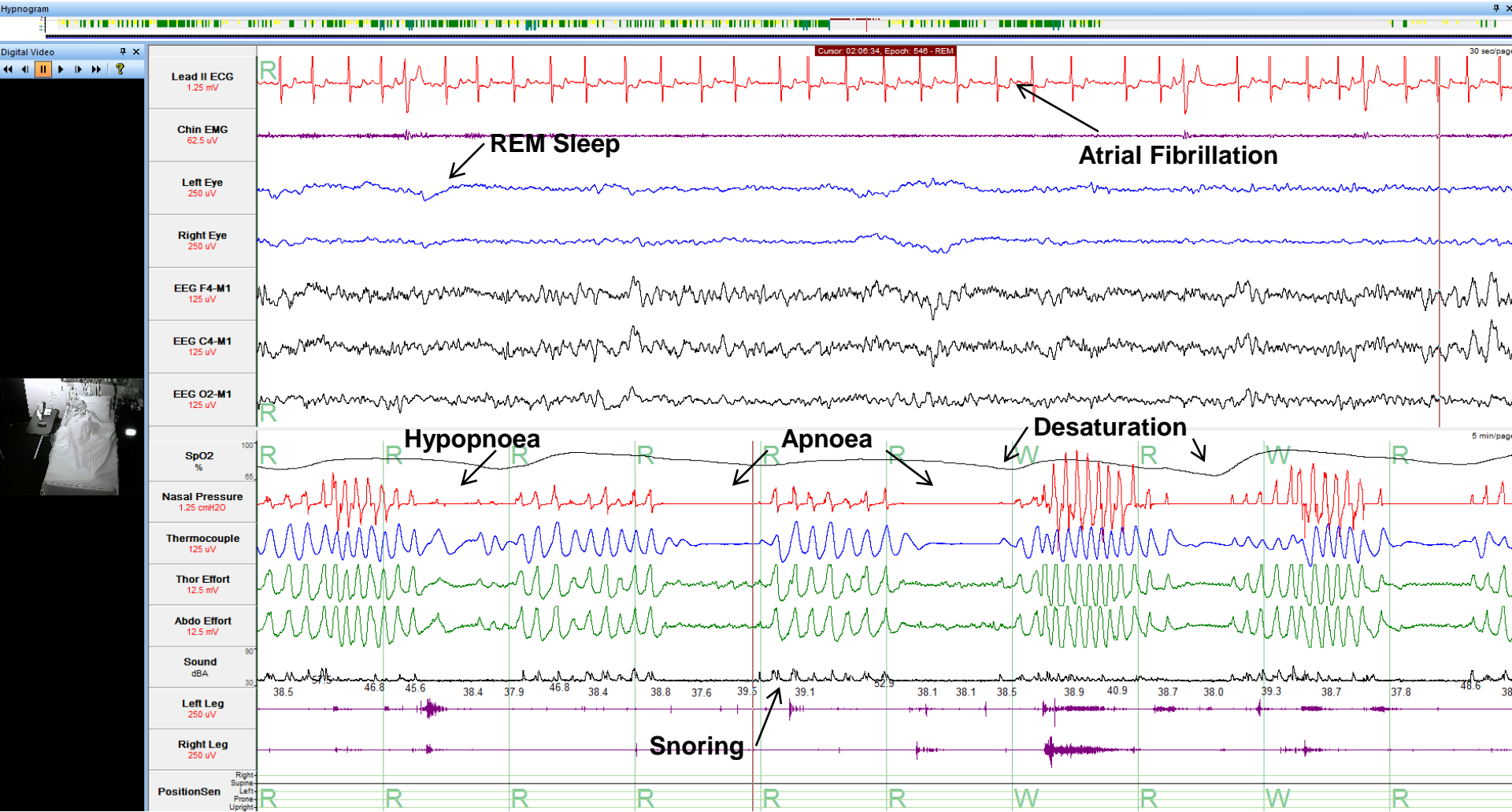


- ✓ Sleep Staging – EEG, eye movements, chin EMG
- ✓ Cardiac – ECG
- ✓ Breathing – nasal pressure, oronasal airflow, chest/abdominal movement, oxygen saturation, snoring sounds
- ✓ Leg movements – leg EMG
- ✓ Sleep Position

Measurement of Physiological Parameters during Sleep



Obstructive Sleep Apnoea



		LEVEL 3	LEVEL 2	LEVEL 1
LOCATION	At-home	✓	✓	-
	In a lab/centre	-	-	✓
OBSERVED BY	Technologist (RPSGT)	-	-	✓
WHAT IT MONITORS	Breathing activity	✓	✓	✓
	Snoring	✓	✓	✓
	Airflow	✓	✓	✓
	Oxygen levels	✓	✓	✓
	Heart rate	✓	✓	✓
	Brain activity	-	✓	✓
	Muscle activity	-	✓	✓
	Sleep quality (onset time, efficiency, REM and non-REM, sources of disturbances)	-	✓	✓
WHAT IT DIAGNOSES	Sleep apnea	✓	✓	✓
	Leg & body/PLMD	-	✓	✓
	Narcolepsy* *(MSLT req. to complete diagnosis)	-	✓	✓
	REM Sleep Behaviour Disorder	-	-	✓

Indications to Treat OSA

- **Symptom Control**
- Safety
 - Patient (Control of nocturnal hypoxaemia)
 - Community
- Risk Factor Modification

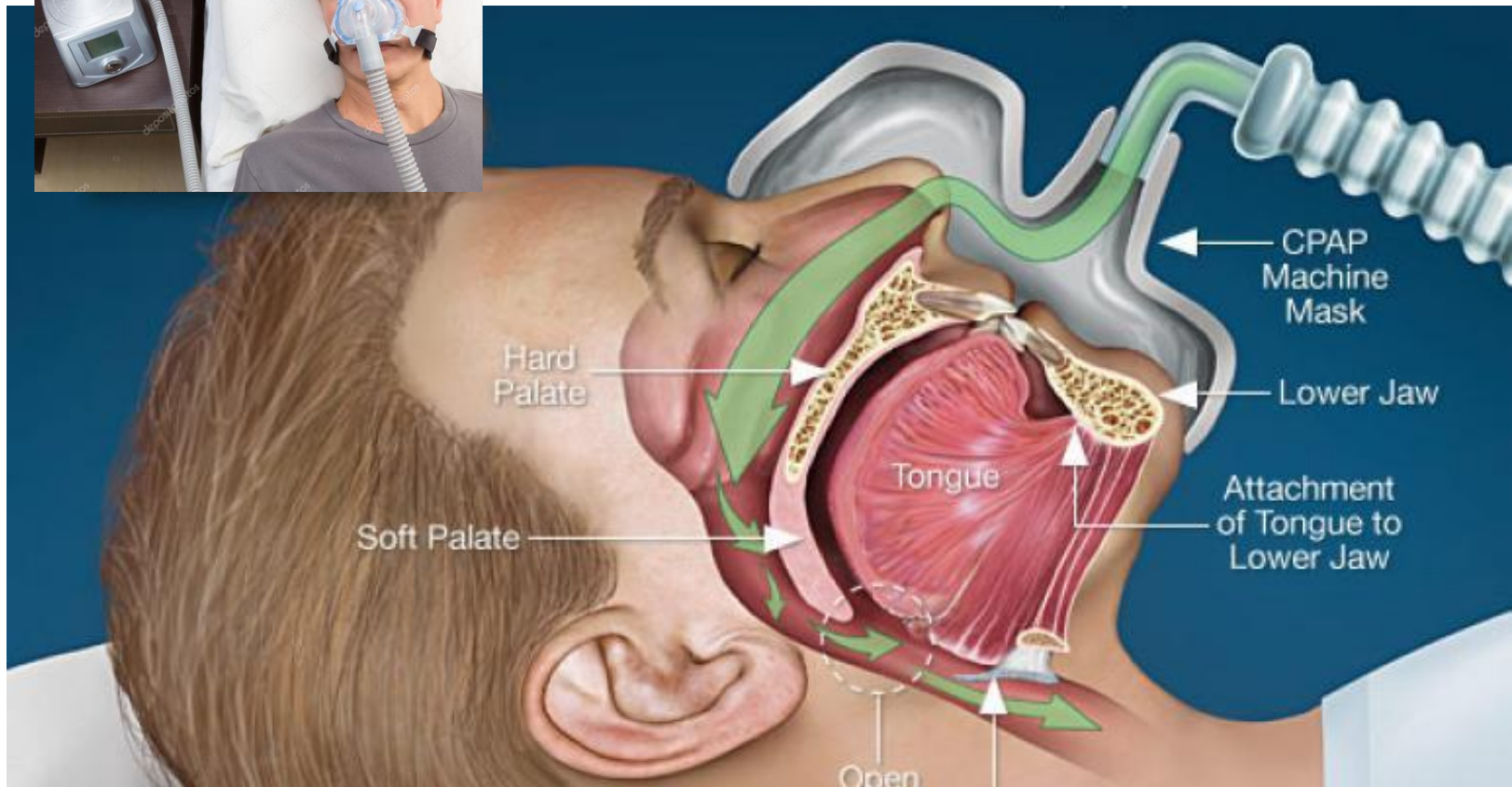


Treatment of OSA

- Risk factor modification
 - Weight reduction
 - Alcohol intake
 - Medication – benzodiazepines & opioids
 - Positional therapy
- Devices to Splint Upper Airway during sleep
 - **CPAP (Continuous Positive Airway Pressure) Therapy**
 - Oral Appliances
 - Other – nasal valve devices
- Surgical Options (limited) – Tonsillectomy, (Bariatric surgery)
- Radical Maxillofacial procedures



Continuous Positive Airway Pressure (CPAP)

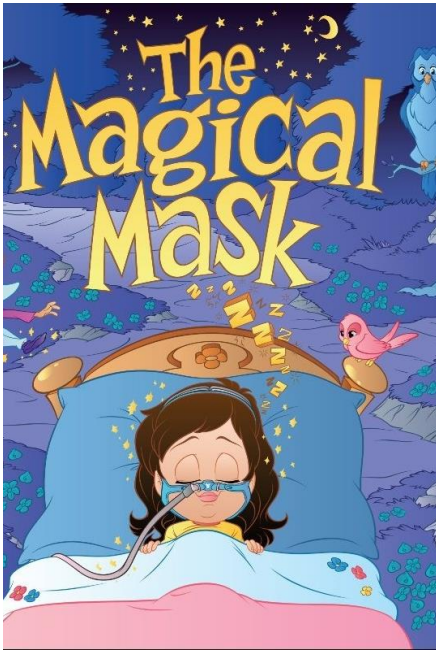


Principles of CPAP

- Positive airway pressure delivered through nasal or oronasal interface “ acts as a ‘Pneumatic Splint’” to upper airway
- Continuous airway pressure (most common – requires determination of individual optimal pressure) or auto-adjusting pressure (APAP device).
- Efficacy dependent on patient acceptance and usage.



Predictors of CPAP Usage

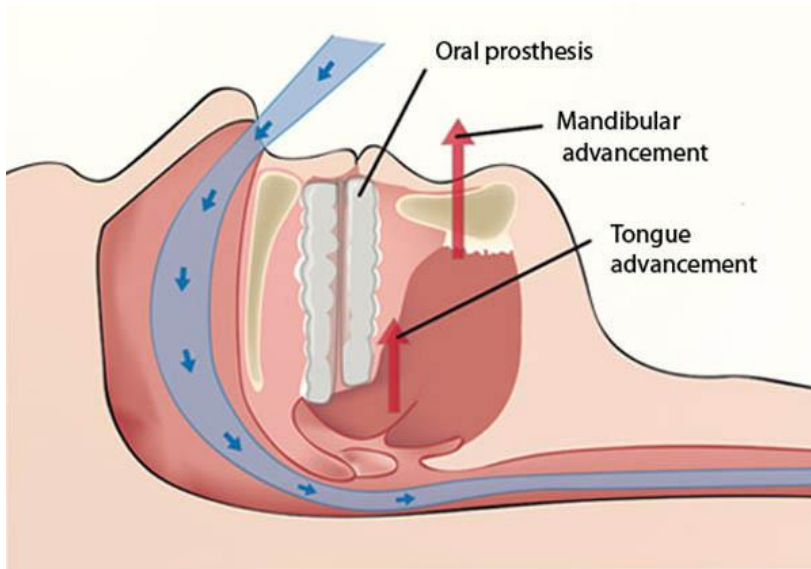


- More severe OSA
- More severe symptoms
- Best predictor of long term usage is usage at 1-3 months
- 65% patients remain on CPAP at 5 years
- Median usage of CPAP is approximately 5.5 hrs/night

McArdle et al Am J Respir Crit Care Med 2000



Oral Appliances



Advance the mandible (and tongue) to support the upper airway during sleep.

Tongue retaining device



Limitations of Oral Appliances

- Need patient to have adequate dentition.
- Need to be individually constructed (boil and bite devices not recommended).
- Unpredictable effect.
 - 50% complete response rate
 - 85% partial response rate
- Cost is similar to CPAP



Oral Appliances Adverse Events



- Common (usually self limited)
- Excessive salivation (75%)
- Dry mouth
- TMJ discomfort
- Serious Malocclusion (15% in first two years)
- Gag



Clinical Assessment and the Law

Driver Obligations

- Not to drive if impaired
- Report conditions that impact driving ability
- Tell the truth
- Comply with prescribed therapy
- Comply with conditional license requirements

Employer or Authority Obligations

- Ensure driver is not impaired
- Legal and reasonable work/rest schedule

Practitioner Obligations

- Assess conditions and fitness to drive (other factors contributing to sleepiness)
- Advise patient
 - Impact on condition on driving
 - Restrictions on driving
 - Need for monitoring
 - Their obligation to report condition
 - Treat and monitor response
- Report condition per state legislation
 - <https://austroads.com.au/drivers-and-vehicles/assessing-fitness-to-drive>
 - NOT fit for unconditional license if
 - ✓ OSA syndrome
 - ✓ freq self report sleepy driving
 - ✓ Previous driving incident due to sleepiness
 - ✓ Treating doctor's concern about safety

Referral Pathways – Community VS Hospital

Community

- ✓ Level 2 and 3 Sleep Study
- ✓ High pretest probability cohort
- ✓ Medicare:

OSA50 >5 or STOPBANG >3

AND ESS ≥8

- ✓ Others – Thoracic/Sleep Physician referral

Treatment:

- ✓ Auto CPAP (APAP)

Hospital

- ✓ Especially for level 1 Sleep Study
- ✓ Complex or significant co-morbidities

**respiratory failure, neuromuscular disease.
hypoventilation, other sleep disorders – narcolepsy,
parasomnia.*

- ✓ Centres:
 - Cairns Hospital, Cairns North
 - Gold Coast University Hospital, Southport
 - Queensland Children's Hospital, South Brisbane
 - Sunshine Coast University Hospital, Birtinya
 - Mater Public Health Services, Brisbane
 - Princess Alexandra Hospital, Woolloongabba
 - Royal Brisbane & Women's Hospital, Herston
 - The Prince Charles Hospital, Chermside
 - Townsville Hospital, Douglas.

Treatment:

- ✓ Especially for In-Lab PAP study
- ✓ Requires complex study - MWT or MSLT
- ✓ To access QHSDP Loan Scheme

Queensland Health Statewide Sleep Disorders Prioritisation

<p>Category 1 (appointment within 30 calendar days)</p>	<ul style="list-style-type: none"> • Suspected or confirmed sleep apnoea with any of the following: <ul style="list-style-type: none"> ◦ Epworth Sleepiness Scale score ≥ 16 ◦ dozing while driving at least 1-2/month ◦ MVA or work-related accident related to sleepiness/inattention in last 12 months ◦ unstable cardiovascular disease e.g. overt heart failure • Suspected or confirmed sleep hypoventilation with any of the following: <ul style="list-style-type: none"> ◦ progressive neuromuscular disorder ◦ established daytime hypercapnia (as demonstrated on ABG (if performed)) ◦ diagnostic sleep investigation demonstrating mean sleep saturation 85-90% (Mean sleep saturation $<85\%$ should ideally be seen within 2 weeks)
<p>Category 2 (appointment within 90 calendar days)</p>	<ul style="list-style-type: none"> • Suspected or confirmed sleep apnoea with any of the following: <ul style="list-style-type: none"> ◦ Epworth Sleepiness Scale score 12-15 ◦ dozing while driving in last 12 months ◦ MVA or work-related accident related to sleepiness/inattention in last 5 years ◦ occupation involving driving / heavy machinery operation ◦ significant comorbidities for example pulmonary hypertension, previous stroke, heart failure, ◦ significant cardiac arrhythmias, neurological disease, acromegaly or hypothyroidism ◦ Respiratory Disturbance Index of ≥ 30 respiratory events per hour on a diagnostic sleep investigation
<p>Category 3 (appointment within 365 calendar days)</p>	<ul style="list-style-type: none"> • Suspected or confirmed sleep disorders, including chronic insomnia, circadian rhythm disorders, parasomnias or sleep related movement disorders that do not meet criteria for Category 1 or 2 but still require specialist review

<https://cpc.health.qld.gov.au/Condition/341/sleep-disordered-breathing-suspected-or-confi>

VITAL REFERRAL INFORMATION

SLEEP DISORDERS

History including duration and severity, snoring witnessed apnoeas, restless sleep, unrefreshed sleep, tiredness, inappropriate falling asleep (circle relevant items)

Management to date (include appliances tried and response)


Epworth Sleepiness scale


OSA-50 or STOP Bang questionnaire result

Full previous sleep study report

Driving licence type

History of motor vehicle accidents or sleepiness when driving

 <p>Metro North Hospital and Health Service The Prince Charles Hospital</p> <p>Sleep Disorders Centre Patient Referral</p>	(Affix patient identification label here)	
	URN: _____	_____
Family Name: _____	_____	
Given Names: _____	_____	
Address: _____	_____	
Date of Birth: _____ Sex: <input type="checkbox"/> M <input type="checkbox"/> F <input type="checkbox"/> I	_____	
Phone (H): _____ (M): _____	_____	
Medicare: _____ Exp: _____	_____	
Pension: _____ Exp: _____	_____	
<p>Dr Deanne Curtin, Director Sleep Disorders Centre (SDC) TPCH</p> <p>Appointments are prioritised according to medical and occupational urgency (see over) and are usually booked with the next available doctor and appointment. There are no out of pocket expenses for all Private Practice Clinic appointments and subsequent investigations. If you would prefer your patient to be booked for a public, no Medicare billing appointment, please tick box <input type="checkbox"/></p> <p><input type="checkbox"/> New Referral <input type="checkbox"/> Indefinite <input type="checkbox"/> Previous TPCH sleep patient ▶ Dr _____</p> <p>Referral Details Referral Date: ____/____/____</p> <p><input type="checkbox"/> Diagnosis and management of sleep-disordered breathing</p> <p><input type="checkbox"/> Treatment initiation for confirmed sleep-disordered breathing</p> <p><input type="checkbox"/> Review of established therapy (CPAP/Bilevel/Other) <i>Attach recent reports and/or downloads</i></p> <p><input type="checkbox"/> Patient undergoing 2-month CPAP trial to fulfil criteria for QH Sleep Disorders Program <i>Pensioner Concession Card (QLD) / Health Care Card holders only; details: http://www.health.qld.gov.au/ghsdp/</i></p> <p><input type="checkbox"/> Diagnosis and management of other sleep disorder - details: _____</p> <p>Essential Patient Information</p> <p><input type="checkbox"/> Previous sleep investigations other than at TPCH: <input type="checkbox"/> Diagnostic <input type="checkbox"/> CPAP <input type="checkbox"/> Other <i>Please attach copies of results with this referral</i></p> <p><input type="checkbox"/> MVA or work-related accident due to sleepiness/inattention in last: <input type="checkbox"/> 12 months <input type="checkbox"/> 5 years</p> <p><input type="checkbox"/> Dozing while driving in the last: <input type="checkbox"/> 1-2 months <input type="checkbox"/> 12 months</p> <p><input type="checkbox"/> Occupation involving driving/heavy machine operation or work performance / employment at risk Current occupation: _____ Driver's licence type: _____</p> <p><input type="checkbox"/> Epworth Sleepiness Scale (ESS): ____ / 24 <input type="checkbox"/> OSA50: ____ / 10 <i>(complete both over page)</i></p> <p><input type="checkbox"/> Main symptoms/co-morbidities: _____</p> <p>Management to date (e.g. CPAP, weight loss, MAS): _____</p>		
<p>Fax or email completed form to: Central Patient Intake (CPI) Fax: 1300 364 952 Email: MNCPI_Referral@health.qld.gov.au</p> <p>General enquiries: Ph: (07) 3139 4803 Office Hours: 8:30am - 4:00pm</p>	<p>REFERRING DOCTOR Provider no: _____</p> <p>Name: _____</p> <p>Postal address: _____</p> <p style="text-align: right;">Postcode: _____</p> <p>Ph: (B) _____ Fax: _____</p> <p>Email: _____</p> <p>Signature: _____</p>	

 <p>Metro North Hospital and Health Service The Prince Charles Hospital</p> <p>Sleep Disorders Centre Patient Referral</p>	(Affix patient identification label here)	
	URN: _____	_____
Family Name: _____	_____	
Given Names: _____	_____	
Address: _____	_____	
Date of Birth: _____ Sex: <input type="checkbox"/> M <input type="checkbox"/> F <input type="checkbox"/> I	_____	
<p>Category 1 (appointment within 30 calendar days)</p> <ul style="list-style-type: none"> Suspected or confirmed sleep apnoea with any of the following: <ul style="list-style-type: none"> Epworth Sleepiness Scale score ≥ 16 dozing while driving at least 1-2/month MVA or work-related accident related to sleepiness/inattention in last 12 months unstable cardiovascular disease e.g. overt heart failure Suspected or confirmed sleep hypoventilation with any of the following: <ul style="list-style-type: none"> progressive neuromuscular disorder established daytime hypercapnia (as demonstrated on ABG (if performed)) diagnostic sleep investigation demonstrating mean sleep saturation 85-90% (Mean sleep saturation $< 85\%$ should ideally be seen within 2 weeks) Unexplained hypersomnolence (Epworth Sleepiness Scale score ≥ 16) not attributed to inadequate sleep hygiene or environmental factors 		
<p>Category 2 (appointment within 90 calendar days)</p> <ul style="list-style-type: none"> Suspected or confirmed sleep apnoea with any of the following: <ul style="list-style-type: none"> Epworth Sleepiness Scale score 12-15 dozing while driving in last 12 months MVA or work-related accident related to sleepiness/inattention in last 5 years occupation involving driving / heavy machinery operation significant comorbidities for example pulmonary hypertension, previous stroke, heart failure, significant cardiac arrhythmias, neurological disease, acromegaly or hypothyroidism Respiratory Disturbance Index of ≥ 30 respiratory events per hour on diagnostic sleep investigation Suspected or confirmed narcolepsy Suspected or confirmed parasomnia or nocturnal seizures with injury to self or others Suspected or confirmed sleep-related movement disorder with injury to self or others Unexplained hypersomnolence (Epworth Sleepiness Scale score ≥ 12) not attributed to inadequate sleep hygiene or environmental factors 		
<p>Category 3 (appointment within 365 calendar days)</p> <ul style="list-style-type: none"> Suspected or confirmed sleep apnoea that do not meet criteria for Category 1 or 2 but still require specialist review Suspected or confirmed sleep disorders (other than sleep apnoea) that do not meet criteria for Category 1 or 2 but still require specialist review 		
<p>Clinical Prioritisation Criteria (CPC) are clinical decision support tools that will help ensure patients referred for public specialist outpatient services in Queensland are assessed in order of clinical urgency - https://metronorth.health.qld.gov.au/specialist_service/refer-your-patient/sleep-medicine</p> <p>Please complete both screening tools below to assist with prioritisation</p>		
<p>OSA50 If yes, score:</p> <p>Obesity: Waist circumference male $>102\text{cm}$, female $>88\text{cm}$ <input type="checkbox"/> 3</p> <p>Snoring: Has your snoring ever bothered people? <input type="checkbox"/> 3</p> <p>Apnoeas: Has anyone noticed that you stop breathing during sleep? <input type="checkbox"/> 2</p> <p>Age: Are you aged 50 years or over? <input type="checkbox"/> 2 Score: / 10</p>		
<p>Epworth Sleepiness Scale (ESS)</p> <p>How likely are you to doze off or fall asleep in the situations described in the box below, in contrast to feeling just tired?</p> <p>This refers to your usual way of life in recent times (i.e. last 4 weeks). Even if you haven't done some of these recently, try to work out how they would have affected you.</p> <p>Use the following scale to circle the most appropriate number for each situation: 0 = Would never doze 1 = Slight chance of dozing 2 = Moderate chance of dozing 3 = High chance of dozing</p> <p>Score: ____ / 24</p>		
	<p>SITUATION</p> <p>Sitting and reading <input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3</p> <p>Watching TV <input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3</p> <p>Sitting, inactive in a public place (e.g. theatre, meeting) <input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3</p> <p>As a passenger in a car for 1 hour without a break <input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3</p> <p>Lying down to rest in the afternoon when circumstances permit <input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3</p> <p>Sitting and talking to someone <input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3</p> <p>Sitting quietly after a lunch without alcohol <input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3</p> <p>In a car, while stopped for a few minutes in the traffic <input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3</p>	<p>Never Slight Moderate High</p>

QHSDP equipment loan scheme

To assist patients who can least afford to purchase their own sleep therapy device.

- I. Hold a current Pensioner Concession Card, Health Care Card or Department of Veterans' Affairs (DVA) white card. Commonwealth Seniors Health Care Card holders are not eligible.
- II. Reside permanently in Queensland
- III. Apnoea Hypopnoea index (AHI) of ≥ 15 /hour on a diagnostic sleep study

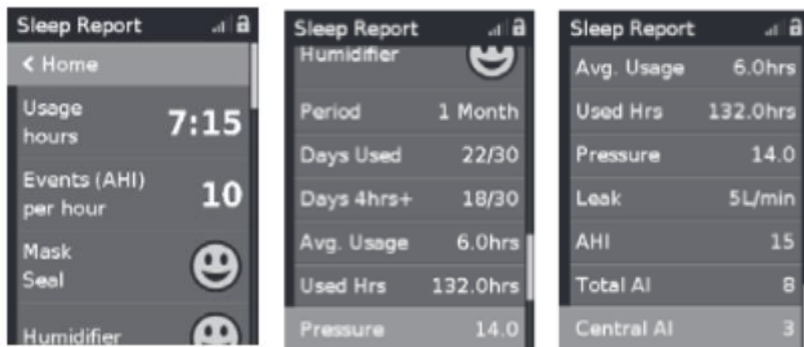
OR

Obstructive sleep apnoea of any severity associated with excessive daytime sleepiness as defined by an Epworth Sleepiness Scale (ESS) of $\geq 10/24$

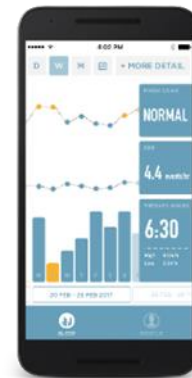
- IV. Rent a positive airway pressure device at their own expense for a minimum 2-month home treatment trial with average usage of at least 4 hours per night over this period.
- V. Purchase their own device accessories - including mask, headgear, and (if required) humidification.

Management of OSA in Primary Setting

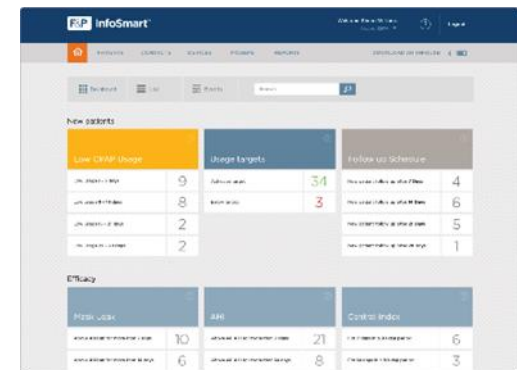
- Monitoring symptoms and ESS
- Driving concern or sleepiness at work
- Lifestyle modification
 - Weight loss and monitoring
 - Medication, Exercise, Sinus/ENT issues
- CPAP adherence and Apnea Hypopnea Index (AHI)
 - Local stockist
 - Mobile apps



Onscreen Data

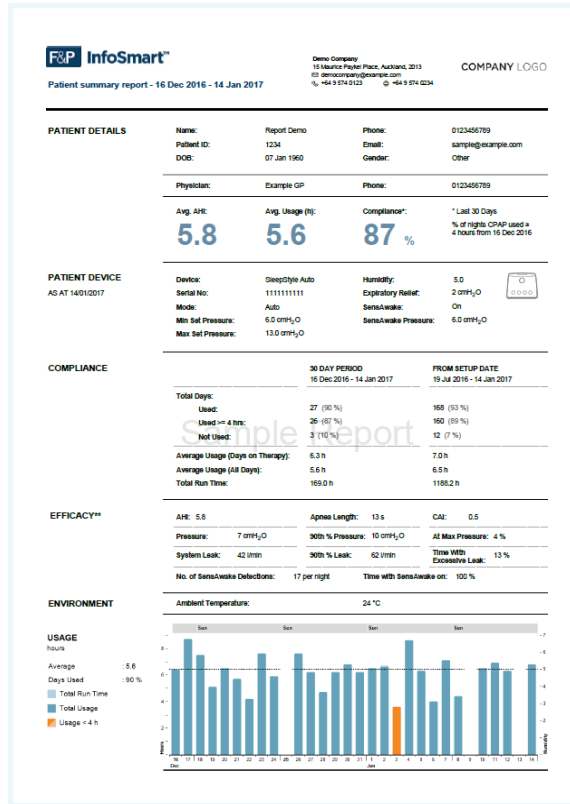


Patient Therapy Compliance App



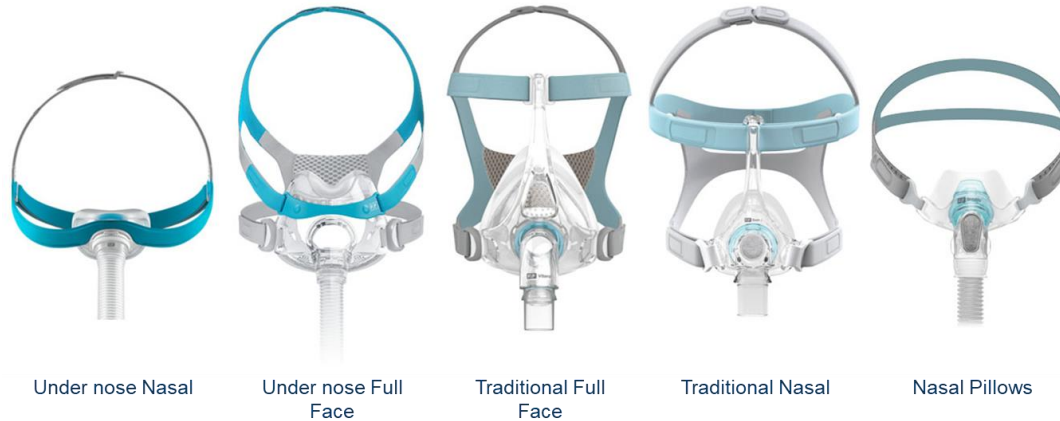
Therapy Compliance Dashboard

Therapy Compliance Reporting



When to re-refer:

- Don't need yearly repeat sleep study
- *Mask changes between nasal vs full face (oro-nasal) interface*



- When to re-refer:
 - Worsening of symptoms and exclude other causes
 - Worsening and persistent elevated AHI
 - Significant weight loss (10-15%) or weight gain

Metro North Hospital and Health Service *Putting people first*

THE SLEEPY PATIENT

Clinical Presentation

45 year old man

- Presents with wife complaining that he is “always tired”.
- Slow to get going in the morning after sleeping 12MN until 5AM.
- Nap in the day (on weekend) for at least two hours.
- Loud snoring
- He says that he does not have a problem.



What is important in the history

- What is the severity of the tiredness
 - ESS, effect on driving, subjective impact
- Sleep pattern
 - Time to bed, time out of bed (how much sleep)
 - Sleep latency
 - Wakefulness after sleep onset
- Other medical history
 - What else can cause tiredness (depression, sleep restriction, heart disease, medications etc)
 - What can be affected by sleep apnoea (cardiac, COPD, cognition)



What is important in the history

- Medications and alcohol
 - Sedatives, antidepressants, B blockers
- OSA Symptoms
 - Snoring
 - Witnessed apnoeas
 - Choking arousals, waking gasping
- Symptoms of other sleep disorders
 - Periodic limb movement disorder
 - Narcolepsy



What is important in the history

Does the patient want treatment?

“I’m just here because of her...”



What is important on clinical examination?

- Factors increasing the likelihood of OSA
- Anthropometrics – BMI
- Upper airway morphology – Mallampati, Tonsillar size
- Features of diseases likely to be affected by OSA
- Blood pressure, heart failure, respiratory disease



Diagnosis of sleep apnoea

- Ultimately a sleep study is required.
- Symptoms non-specific and may be multi-factorial
- Symptoms and severity of findings on polysomnography only weakly correlate
- The motivation to treat OSA is different if there is no sleep hypoxaemia vs profound sleep hypoxaemia



Summary

Obstructive sleep apnoea

- Is common
- Significant consequences (if severe)
- Assessment requires both clinical assessment and measurement of sleep
- Most validated treatments are CPAP and oral appliances



Thank You. Questions?

*Sleep is the golden chain that ties health
and our bodies together.*

Thomas Dekker

*Sleep is a reward for some, a punishment
for others. For all, it is a sanction.*

Isidore Ducasse Lautreamont

*Without enough sleep, we all
become tall two-year-olds.*

JoJo Jensen, *Dirt Farmer Wisdom*, 2002

