Sleepy in Tacoma

and everywhere else

Arthur Knodel MD

Epworth Sleepiness Scale

Epworth Sleepiness Scale

How likely are you to doze off or fall asleep in the following situations?
Use the following scale to choose the most appropriate number:

0 no chance	1 slight chance	2 moderate chance	3 high chance

Sitting and reading	0 1 2 3
Watching television	0 1 2 3
Sitting inactive, in a public space	0 1 2 3
Lying down to rest in the afternoon when circumstances permit	0 1 2 3
Sitting and talking to someone	0 1 2 3
Sitting quietly after a lunch without alcohol	0 1 2 3
As a passenger in car for an hour without a break	0 1 2 3
In a car, while stopped for a few minutes in traffic	0 1 2 3

Total Score:

Inattentiveness and Catastrophes

Challenger Explosion 1986

Exxon Valdez 1989

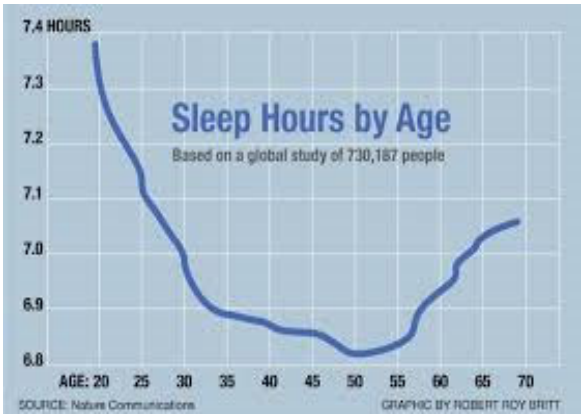
Chernobyl Nuclear Plant 1986

Terminal Insomnia

Do we need sleep? Rat experiment

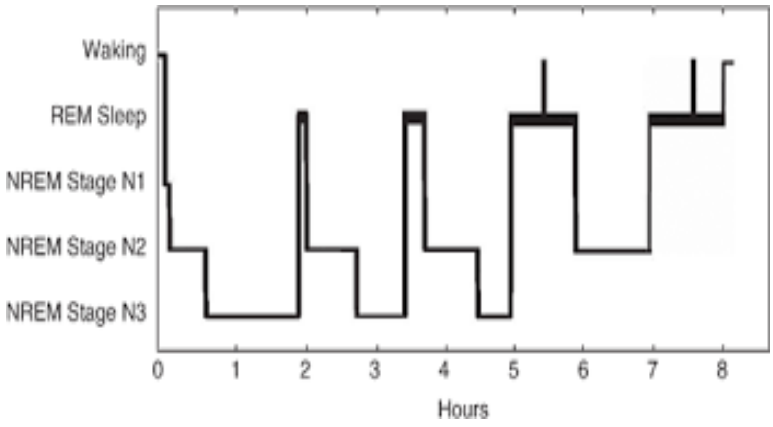
Why do we sleep: Without sleep we get sleepy and are unable to work…….. Theorized the awake state causes a build up of chemicals that our brain & body need to eliminate

Sleep Requirements by Age

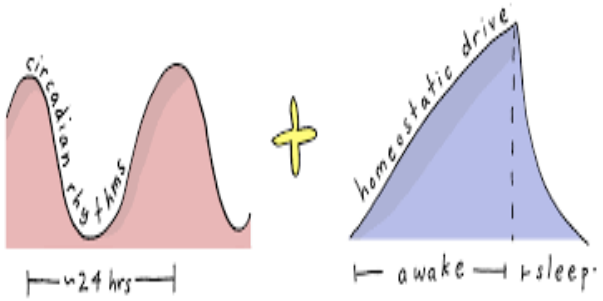


Normal Sleep:

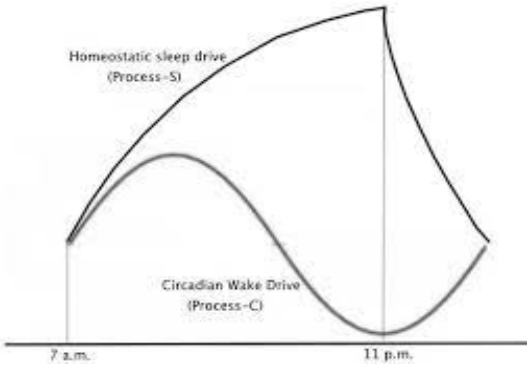
Stage 1 : Transition wake to sleep
Stage 2 : Light sleep
Stage 3 : Deep sleep or Slow wave sleep
REM



Sleep-Wake Cycle



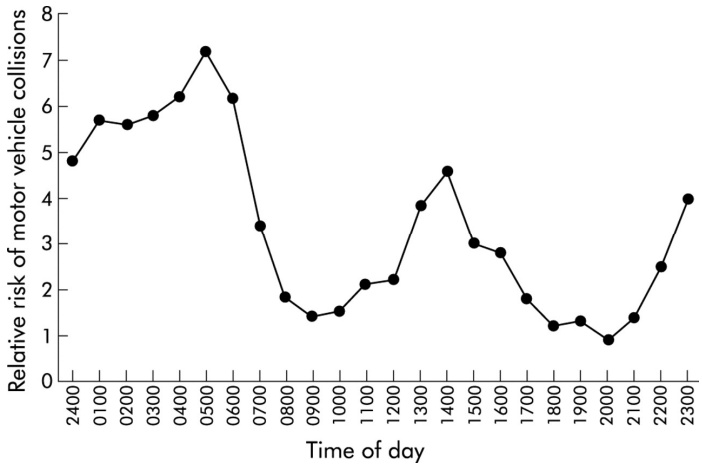
Sleep Wake Cycle



Psychomotor Vigilance

24 hour without sleep = BAC of 0.10%

Motor Vehicle Crashes and Time of Day



Insufficient Sleep

- Insomnia
  - Sleep Onset
  - Maintenance
  - Mixed
- Nonrestorative Sleep
- Societal Pressure
  - The city that never sleeps
  - If you snooze you lose
  - Napping is a sign of lazziness

Insomnia

- 1/3 of population mostly short term (3 month criteria)
- A good night's sleep starts the moment you wake up

Causes:	Treatment
Hyperarousal (Worry & Sleep anxiety)	CBT: Education Relaxation Counseling
Poor Sleep Hygiene (Daytime health habits-nighttime routine)	Consistent wake-sleep time Exercise Restrict stimulants Judicious naps and nightcaps Avoid screens Conducive sleep environment Unwind routine Read book White noise

Medical Problems (Nocturia, GERD Heart failure Sleep disorders)
Treat: Underlying condition

Pharmacotherapy

- Light therapy, schedule changes and melatonin for circadian disturbances
- Medications:

BZD: Xanax Ativan: Addictive and disrupt normal sleep architecture

Non BZD agonist: Ambien Sonata Dependence sleep walking

Antidepressant: Doxepin Trazadone Mirtazipine: Hangover

Antihistamine: Benadryl Unisom: Hang over tolerance urinary retention dry mouth

Dual orexin receptor antagonist: Belsomera Dizziness weird dreams $$

Naturopathic: Valerian root

Alcohol

Jet Lag

- West is Best

Get extra sleep like turning back the clock in the fall

- East is a Beast

Loss sleep hours

If fly to London upon arrival take Melatonin 10:00PM and Bright lights 11:00 AM

- Sleep Phase Delay

Avoid screens after 8:00 PM and bright lights at 7:00 AM

Obstructive Sleep Apnea

- Obstructive Sleep Apnea (OSAS) is one of the most important medical conditions identified in the last 50 years
- Common disease 2% adult female and 4 % adult male
- Underdiagnosed: 80-90%

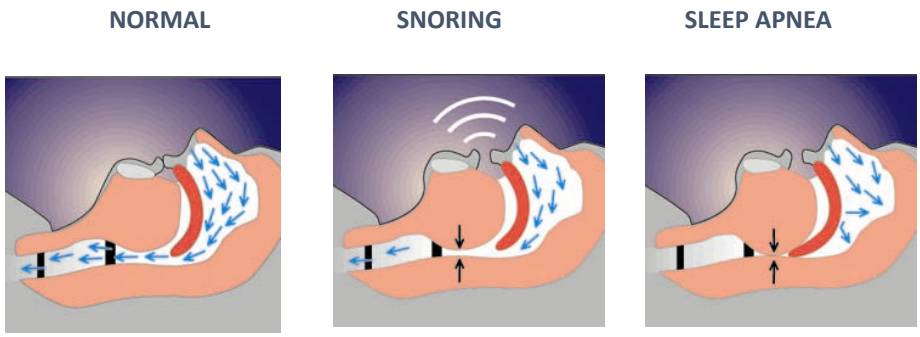
History

- Charles Dickens: The Pickwick Papers
- William Osler: Pickwickian Syndrome 1918
- Guilleminault and Dement at Stanford: OSAS 1977
- Fujita UPPP 1981
- Sullivan: CPAP 1981

Predisposing Factors

- Male gender
- Age and post menopausal
- Obesity (High BMI)
- Large neck (>17 in. male and > 16. in female)
- Family history
- Ethnicity
- Smoking
- Shortening of the mandible and/or maxilla
- Hypothyroidism and acromegaly
- Myotonic dystrophy Ehlers Danlos

Anatomy of OSA



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Clinical Features of Sleep Apnea

Daytime symptoms (patient + bed partner)

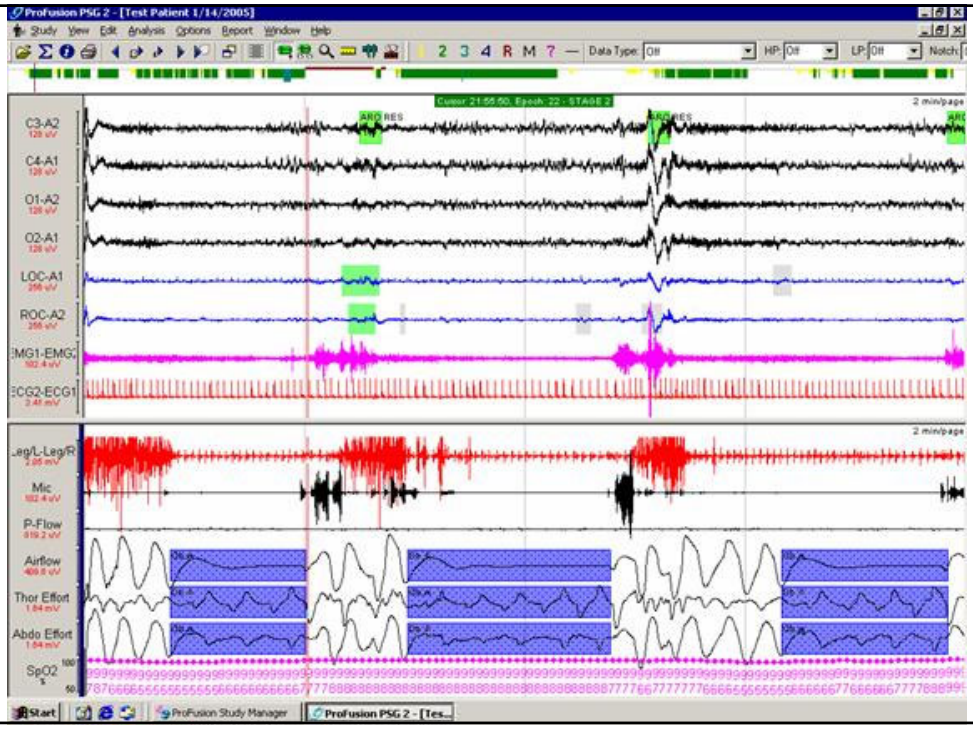
- EDS Non restorative sleep (even after nap)
- By-products of EDS… automatic behavior, poor concentration, difficulty with memory and judgement
- Change in personality… aggressive behaviors, irritable, anxiety, depression
- Sexual dysfunction
- Headaches

Clinical Features of Sleep Apnea

Nighttime symptoms (bed partner)

- Snoring and apnea
- Abnormal motor activity during sleep
- Nocturnal sleep disruption
- Choking or “feeling of dying”
- GER
- Nocturia
- Diaphoresis

Polysomnogram



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Home Sleep Test

- Three components (usually 4-7 channels):
  -Nasal pressure transducer: Airflow
  -RIP belts: Respiratory effort
  -Pulse oximetry : O2 saturation and HR
- Systematic review and meta analysis of 5026 patients with all levels of OSAS comparing PSG to HST showed no significant differences in clinical management

CAMJ 2014

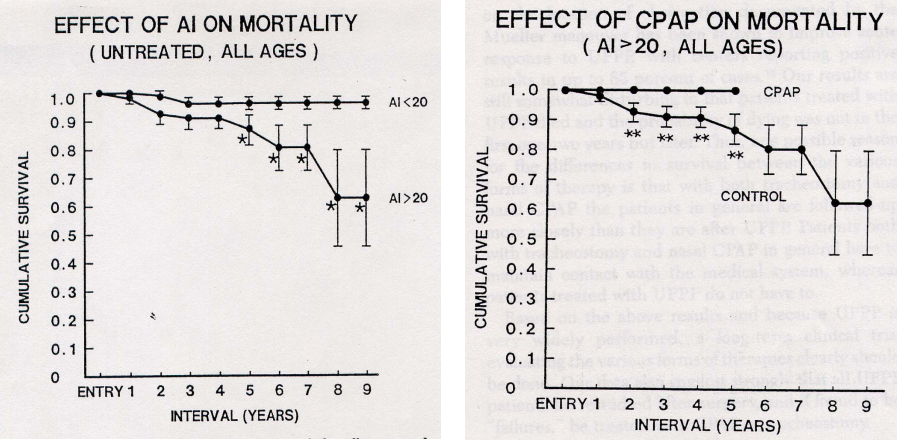
Home Sleep Test

Obstructive Sleep Apnea
Rating the severity

- Severity is rated based on number of respiratory events
- AHI: apnea-hypopnea index is the number of breathing cessations (complete or partial) per hour of sleep
  - Mild - 5-15

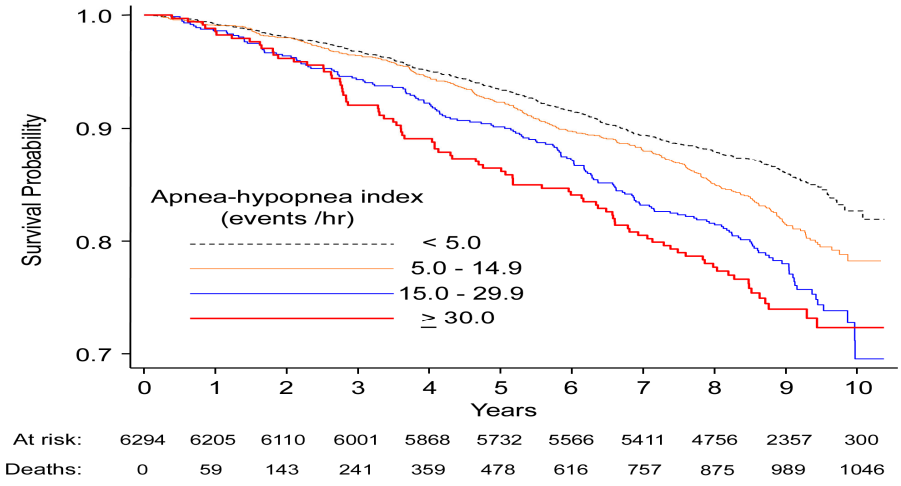
    SAHS requires Sx: EDS, Htn, impaired cognition, mood disorder, IHD or stroke
  - Moderate -15-30
  - Severe - > 30
- Severity rating correlates with cardiovascular effects, but not with symptoms of sleepiness

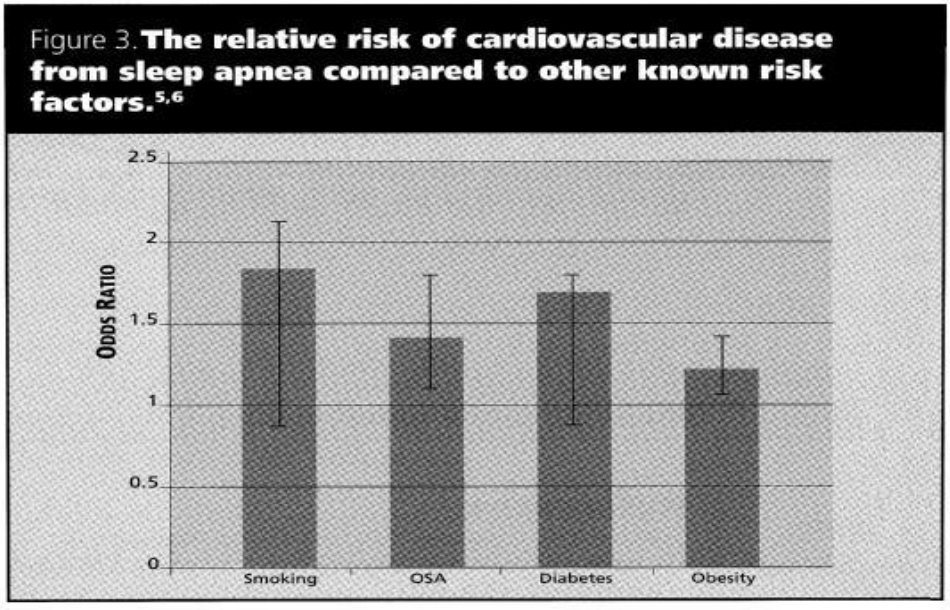
Mortality Associated with OSA
Sleep apnea shortens life



He et al, Chest Vol. 94(1) pp 9-14, 1988

OSA and Longevity





OSA and Hypertension

- Hypertension found in 35% of all patients with OSAS and 70% of patients with drug resistant hypertension
- Meta analysis of 31 RCT with 1820 subjects showed CPAP to reduce mean BP and diastolic BP by 2.2 and 1.9 mm Hg
- A 2-3 mmHg reduction in BP could have a clinically significant effect on subsequent CV mortality

Fava Chest 2014

Pumarega AJRCCM 2011

Current Treatment for OSA

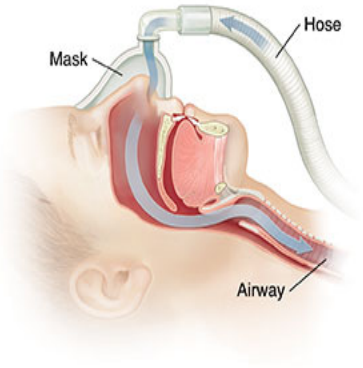
NON – SURGICAL

- Weight Loss
- Positional Tx
- Oral appliances
- CPAP
- *Medication AD109*
  (aroxybutynin + atomoxetine)

SURGICAL

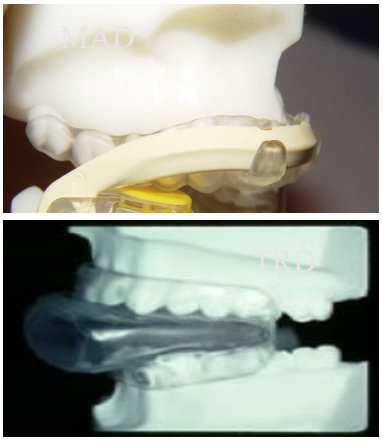
- Tracheostomy
- UPPP
- Glossectomy
- Hyoid advancement
- Mandibular advancement
- Hypoglossal n. stim

APB 16/03/09



Oral Appliances

- □ Appropriate first-line treatment for Mild OSA and primary snoring
- □ Not as effective as CPAP, 52% OSA have AHI<10%
- □ Young, non-obese
- □ Second line therapy for moderate-severe OSA
- □ Patient's choice - Not tolerating / refuse to use CPAP, or are not surgical candidates



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Surgery

- Nose: nasal surgery
- UPPP: 54% of patients have 50% decrease in AHI
- Retrolingular pharynx: mandibular advancement, linguloplasty and resection, mandibular osteotomy, genioglossus advancement with hyoid myotomy & suspension (GAHM), and maxillary & mandibular advancement osteotomy(MMO)
- High perioperative risk

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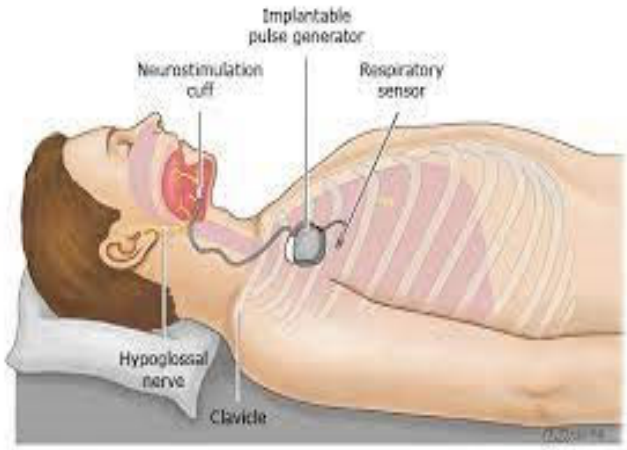
Hypopharyngeal Nerve Stimulator



The End

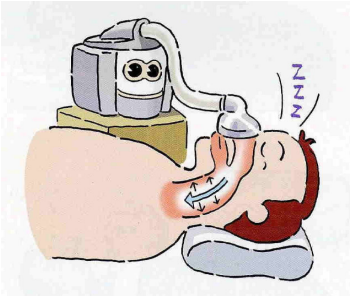
?

CPAP Therapy- Side Effects

- Nasal congestion
- Rhinorrhea
- Oronasal dryness

* Skin abrasions/ rash

- Conjunctivitis from air leak
- Chest discomfort
- Claustrophobia



Sleepiness Related Accidents in Sleep Apnea Patients

160 Swiss patients with Sleep Apnea compared to 156 normal

-12.4% of drivers with sleep apnea suffered a MVA compared to 2.9% without the disease

-With NCPAP therapy in 85 patients the rate of MVA decreased from 10.6 to 2.7 per million km.