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SLEEP

- Who sleeps?
- Why must we sleep?
- Stages of sleep: wake, NREM(Non Rapid Eye Movement) and REM (Rapid Eye Movement)and transitions thru wake
- Consequences of poor sleep
 - Reduced life span
 - Dementia
 - Social dysfunction



Human Sleep requirements

- Newborns 12 to 16 hours (one half in REM)
- Children 3 to 5years 10-12 hours (with mid afternoon nap)
- Teenagers 8-10 hours with delayed sleep onset/awakening
- Adults 7+ hours(may not be consecutive)

- Everyone is faced with Circadian rhythm issues at 1400 (siesta time)

Snore

- Collapsibility of a pharynx/epiglottis where the air enters trachea/lung and food enters esophagus
- Nasal snore/pharyngeal snore
- Snore is a sign of illness not rest

Dreams

- Do all animals dream?
- Why must we dream?
- Are nightmares good or bad?
- Human REM cycle of 90 minutes (remembering dreams)
 - “awake” brain but paralyzed body
- Deep sleep NREM (body restorative sleep) brain in sine wave
- Rebound from sleep deprivation-first REM, later NREM
- Movements during sleep

Hypersomnia-excessive day somnolence

Sleep Apnea (80% of diagnoses)

Narcolepsy

Sleep Deprivation-multiple secondary causes

Medications-chemical consumption(caffeine, EtOH, stimulants)



Class 1



Class 2



Class 3

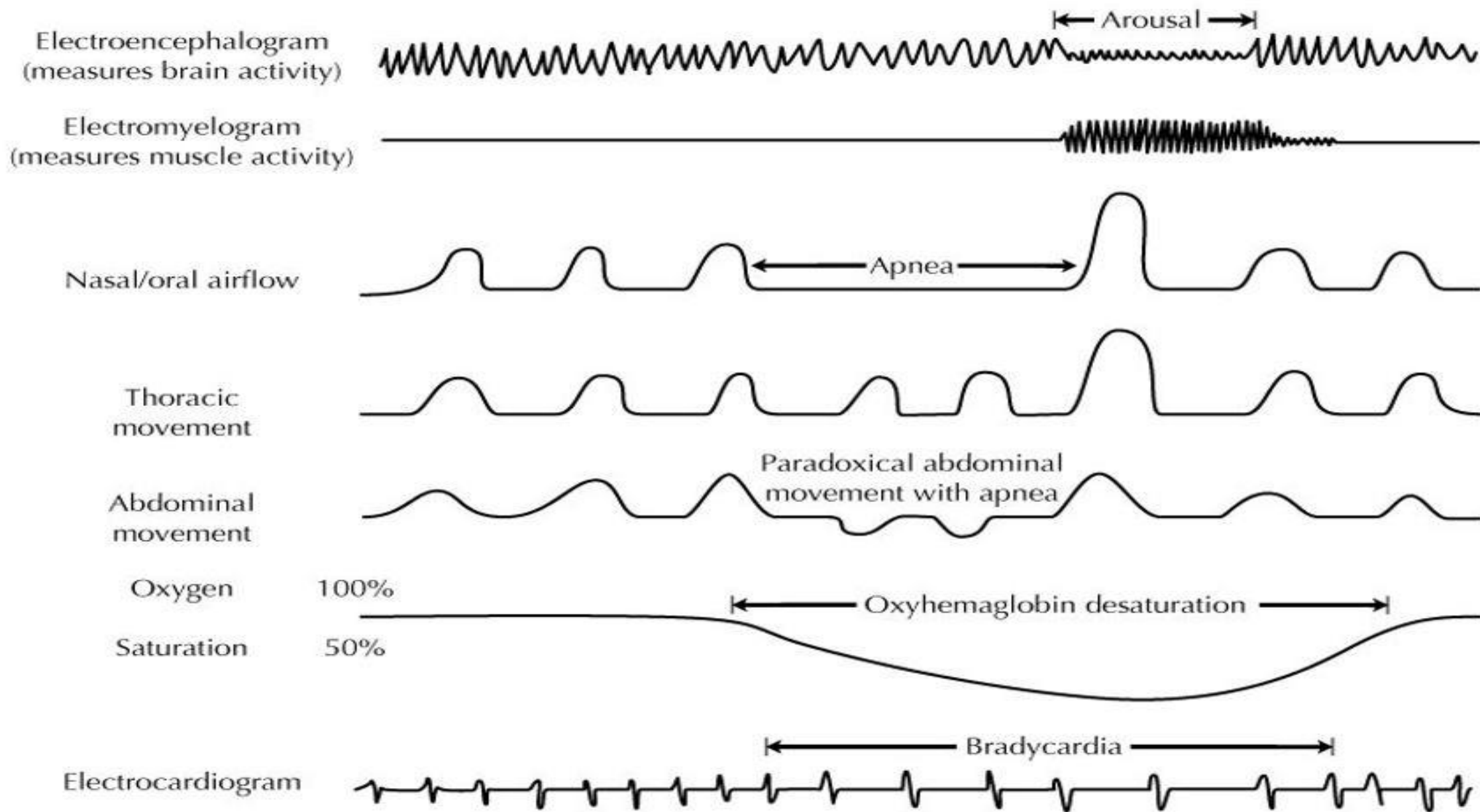


Class 4



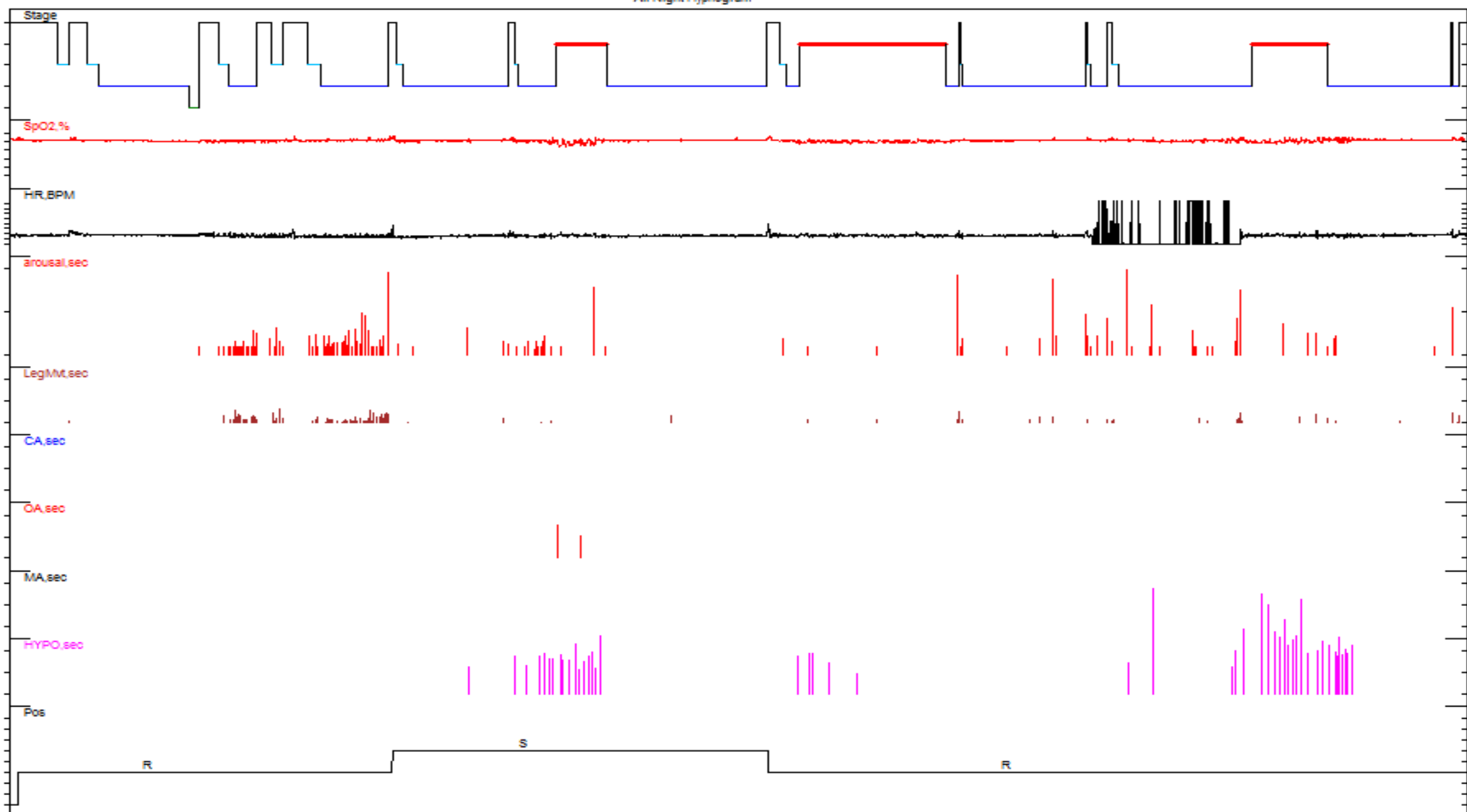
SYMPTOMS OF APNEA

- Episodes of breath pauses during sleep — confirm by another person.
- Gasping for air during sleep and awakening with a dry mouth.
- Morning headache that clears in 5-10 minutes
- Neck size > 43 cm
- Nocturia- nocturnal urination
- Difficulty staying asleep (insomnia) Excessive daytime sleepiness (hypersomnia)
- Difficulty paying attention while awake. Nodding off
- Accelerated Cardiovascular/Stroke occurrence
- Increased Motor vehicle accidents



Warvedaker NV et al. Best Practice of Medicine. Sept. 1999

All Night Hypnogram



CPAP therapy

Continuous Positive Airway Pressure



Benefits of Obstructive Sleep Apnea (OSA) Tx

- Reduced cardiovascular morbidity
- Reduced strokes
- May reduce automobile collisions
- Reduced excessive day sleepiness
- Less professed fatigue
- Reduced bruxism (teeth grinding)
- Possible weight loss
- Bedpartner joy

CPAP problems

- Only 40%- 50% adherence to TX
- Replacement equipment- masks, filters, headgear
- Discomfort with masks
- Humidification issues
- Temperature issues
- Facial rashes
- Nightly requirement for usage

Alternative TX modalities for OSA

- Mandibular advancing device for apnea AHI < 20/hour
- UPPP surgery for apnea AHI < 20/hour (uvulopalatalpharyngoplasty)
- Tongue advancing surgery
- Maxilla advancing surgery
- Significant weight loss (only 1/3 effective)
- Therapy to increase respiratory effort and respiratory drive
- Inspire hypoglossal nerve stimulation (Inspire system)



Inspire Restores Muscle Tone & Opens The Upper Airway During Sleep

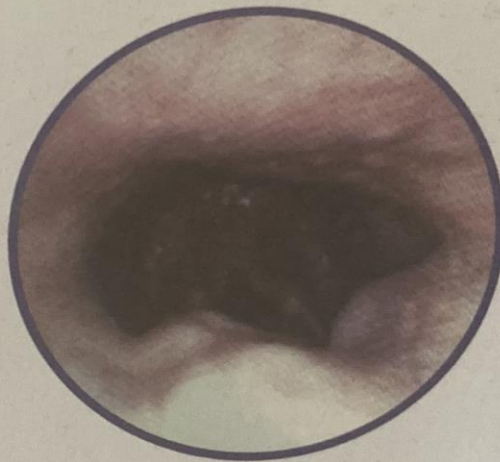


Palate



Tongue Base

Obstructed Airway



Palate

180% increase
in airway dimension



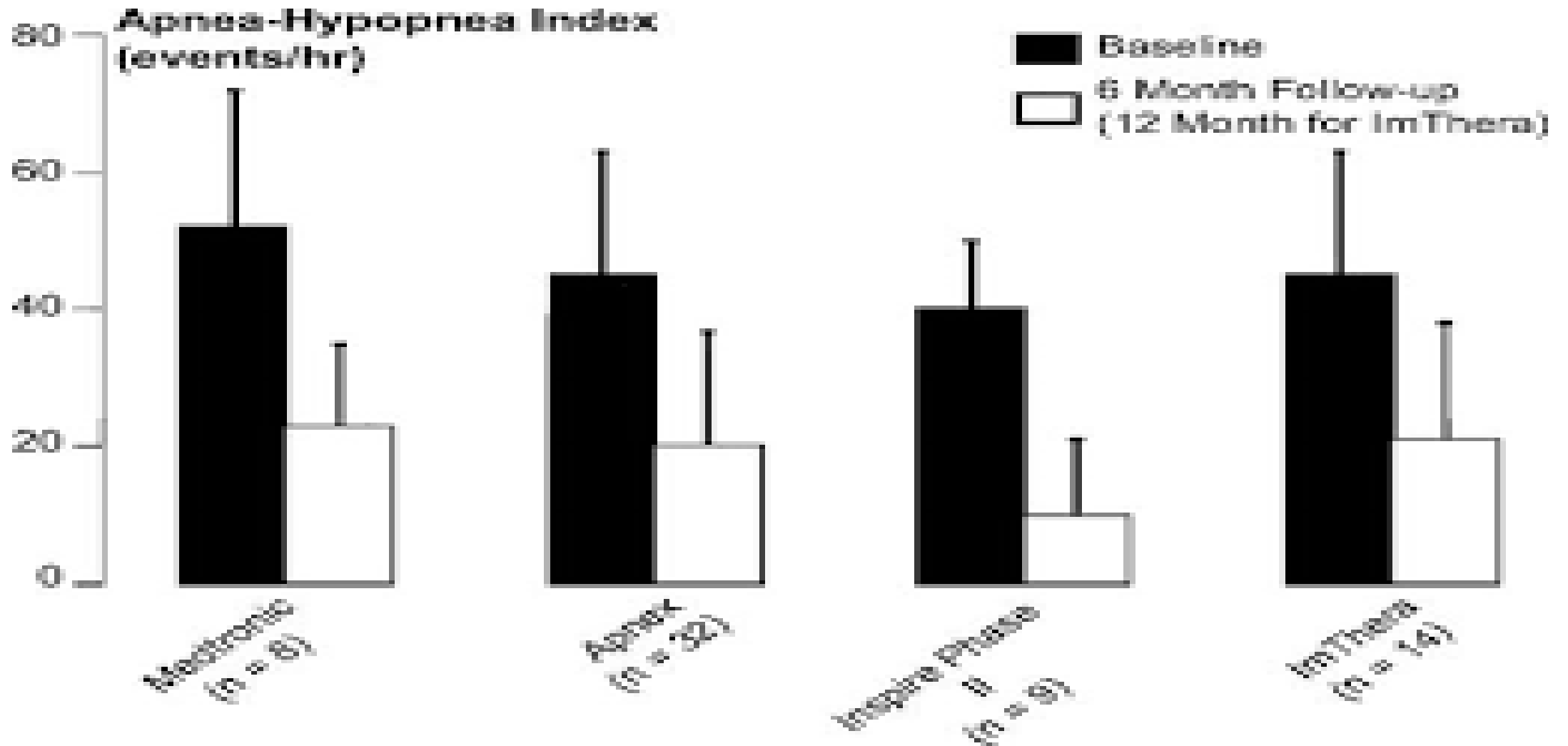
Tongue Base

130% increase
in airway dimension

Open Airway

At therapeutic titrated levels, Inspire therapy

Nerve stimulator effect on AHI at 6 months



Narcolepsy

- Poor regulation of sleep/wake/dream cycling
- Loss of orexin/hypocretin support for wakefulness
- Poor day alertness and poor sleep consolidation(both parts of sleep)
- EXCESSIVE DAY SOMNOLENCE
- CATAPLEXY
- HYPNOGOGIC AND HYPNOPOMPIC HALLUCINATIONS

TX with day stimulants and night sleep enhancers(xyrem)

Scheduled Naps, regularized sleep/wake times

Sleep disruptors

- Periodic limb motion disorder(low iron, medication, familial)
Tx with iron correction, dopamine agonists, neuropathy TX,
benzodiazepam drugs,
- Sleep hygiene - caffeine, sleep timing, environment, bed partner
- Sleep Seizures
- Nocturnal asthma
- Nocturnal pain
- Dream intrusion
- REM behavior disorder
- Shift workers

Insomnia-Best habits

Regularized sleep exit time

Allow +/- 8 hours for sleep

Regularize sleep onset time

Cool dark room

Wind down time in evening (hot bath, no blue light devices)

Avoid languishing in bed with mid sleep disruption

Limit mid sleep stimulation

Write down “tasks” for AM efforts

Understanding morning lark/night owl variants, long and short sleepers

Insomnia Tx

- Cognitive behavioral therapy
- Sleep hygiene evaluation
- Soporifics- trazodone, doxepin, benzos, orexin blockers, antipsychotics, diphenhydramine



PINE TREE
TRAIL
HALFWAY POINT
ELEV. 6880