

Sleep Disorders among Veterans with PTSD

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Learning objectives

- **Sleep problems** among veterans with post traumatic stress disorder (**PTSD**).
 - **Insomnia**: clinical presentation, diagnosis and treatment among veterans with PTSD.
 - **Obstructive sleep apnea**: presentation, diagnosis and treatment options among veterans with PTSD.

Poll questions

What is your role in treating veterans with PTSD?

- A. Clinician
- B. TBI Physician
- C. Psychologist
- D. Social worker
- E. Case manager

Poll Question

In your experience, is “sleep” a challenge for PTSD sufferers?

- 1. Yes
- 2. No

In your regular practice, do you routinely ask the patients how well they sleep at night?

- 1. Yes
- 2. No

Poll Question

- A 55 year old veteran with chronic PTSD came in complaining his sleep is getting worse with repeated awakening with nightmares and panic attacks, waking up with headache, feeling very tired and sleepy during the day. His wife complains that he is awake most of the night and when he falls asleep, he snores loud, stops breathing during sleep. He is compliant with all his medications. What is your next step in management?

Poll question- answers

- 1. Adjust his anti-depressant medications
- 2. Send for psychotherapy
- 3. Ask to follow with primary care provider
- 4. Request sleep consult for sleep study

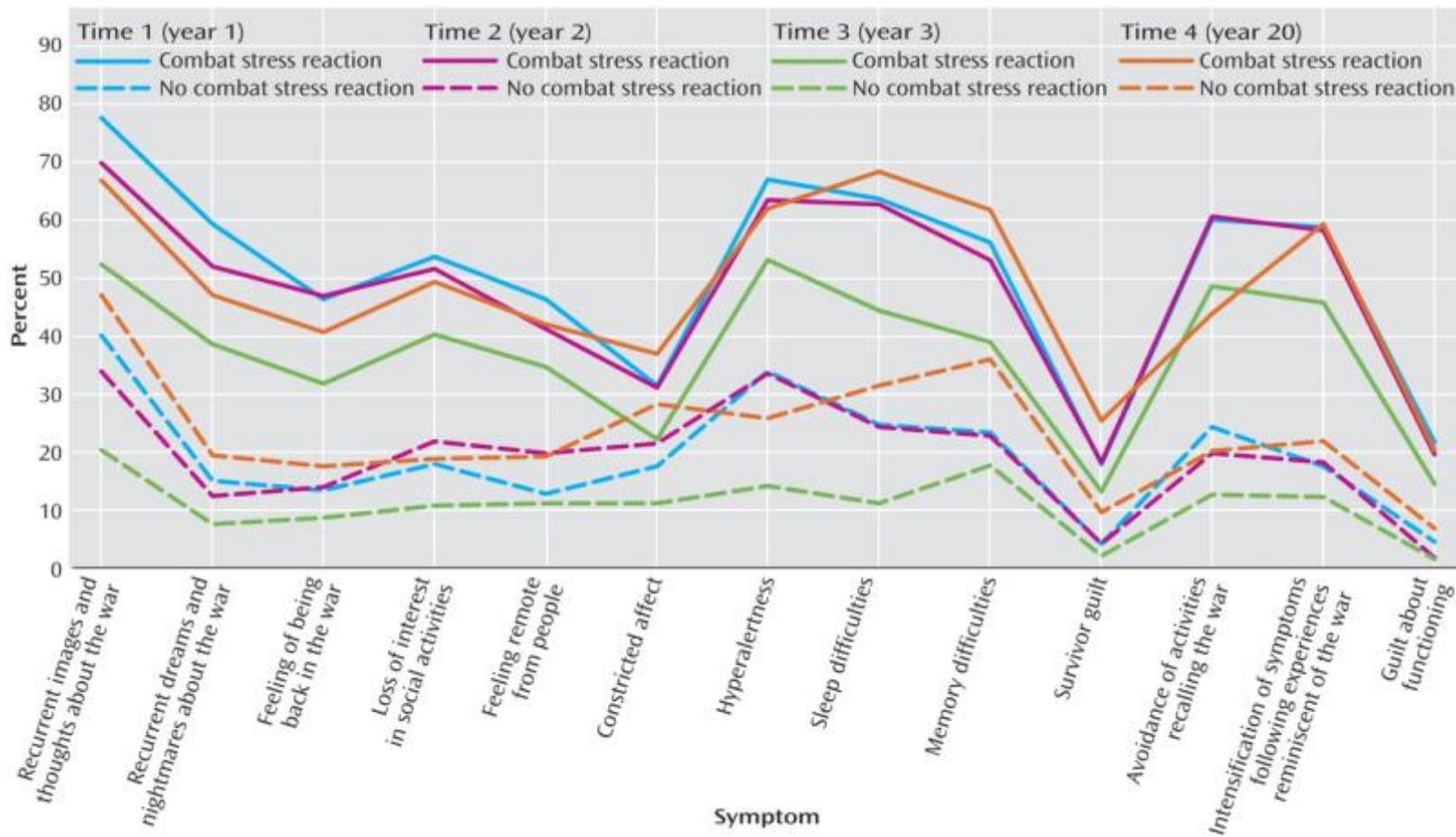
Post traumatic stress disorder

- PTSD is an anxiety disorder that develops in response to severe traumatic life stress. Studies have shown that certain type of trauma like combat, rape and other form of assaultive violence are more likely than others to result in PTSD.
- Lifetime prevalence of PTSD in the community is around 5-6% compared to 15-31% among veterans.
- The syndrome of PTSD puts a heavy toll on the quality of life of the individual and society.

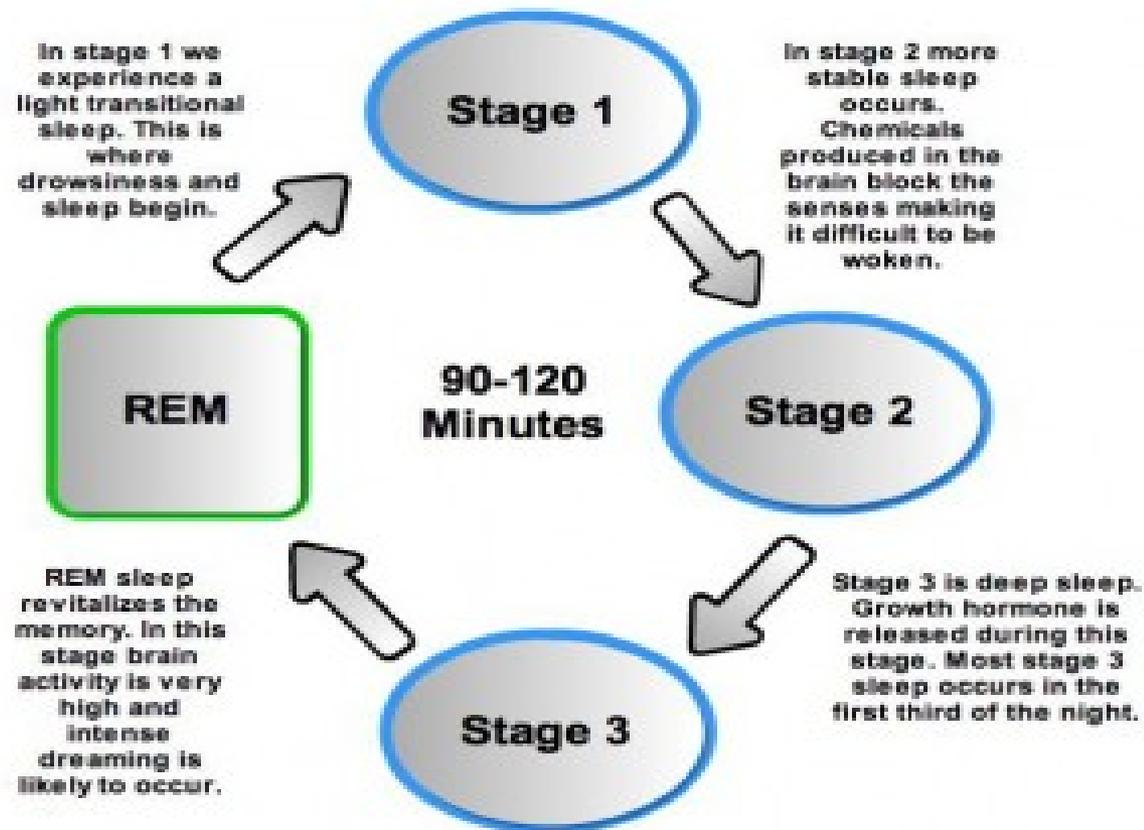
Sleep among PTSD sufferers

- 70% to 90% patients with PTSD suffer from sleep disturbances.
- PTSD sufferers have much higher prevalence of insomnia, nightmares, restless sleep and also sleep related breathing disorders like obstructive sleep apnea when compared to healthy cohorts.
- Specific sleep treatments for sleep disturbances in this population lead to significant improvement in sleep and global PTSD symptoms.

Sleep difficulties after combat



Sleep Cycle



Insomnia

- Difficulty in initiating and maintaining sleep resulting in daytime functioning impairment is termed as insomnia.
 - In a recent study of 110 military personnel who returned from combat, 88.2% were diagnosed with sleep disorders. Among the sleep disorders, 63.6% met the criteria for insomnia and 62.7% met diagnostic criteria for obstructive sleep apnea. ²
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- 2. Vincent Mysliwiec et al. Sleep Disorders in US Military personnel: a high rate of comorbid insomnia and obstructive sleep apnea. CHEST 2013

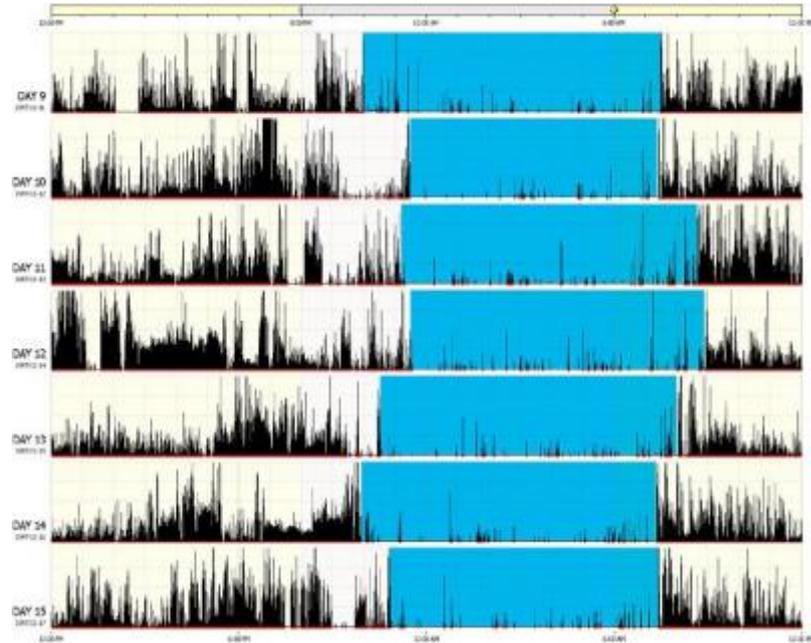
How to diagnose insomnia

- 1. Subjective assessment:
- By clinical interview with self report questionnaires like Insomnia severity index (ISI)
- Pittsburgh sleep quality index, or Epworth sleepiness scale.



Diagnosis and treatment of insomnia

- Objective assessment:
- Sleep diary
- Actigraphy
- Polysomnography
- No objective tools are recommended for diagnosis of insomnia.



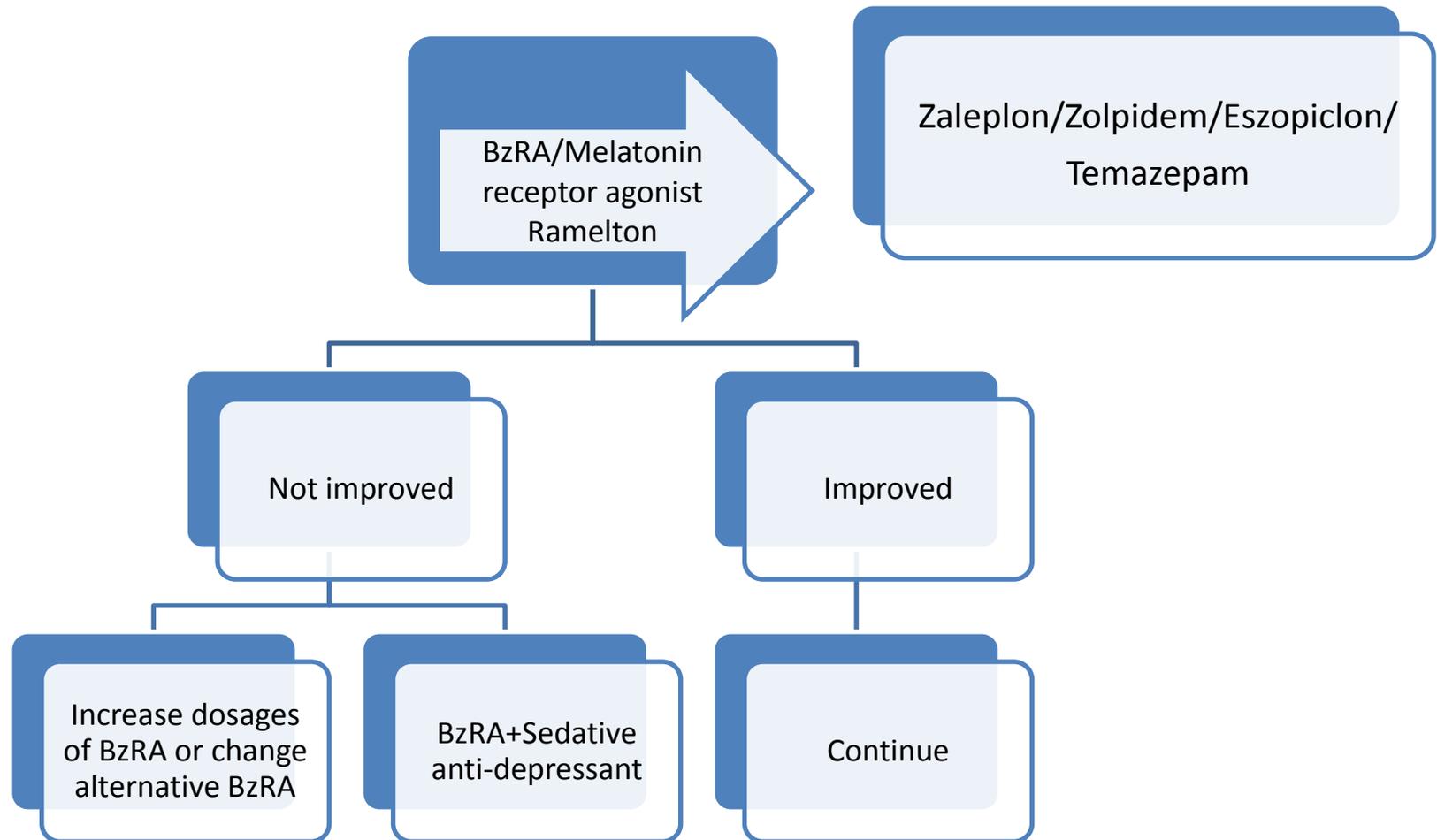
Treatment of Insomnia

- Sleep Hygiene
- Cognitive behavioral therapy
- Pharmacological treatment
- Treat other causes triggering insomnia like anxiety, depression or sleep disordered breathing like obstructive sleep apnea.

Sleep Hygiene

- Keep regular bedtime and waking time, avoid spending excessive time in bed.
- Avoid use of sleep disrupting products
- Avoid caffeine, alcohol, nicotine before bedtime
- Avoid exercise 2 hours prior to bedtime
- Avoid stimulating activities close to bedtime
- Avoid watching television, reading, snacking in bed
- Avoid use of bed for activities other than sleep
- Maintain a comfortable sleeping environment
- Keep the bedroom quiet and cool.

Hypnotic indicated insomnia



Hypnotics used in insomnia

- Ramelteon: Melatonin receptor agonist (MT1 and MT2), 8 mg 30 min before sleep.
- Benzodiazepine receptor agonist: Eszopiclone, zaleplon, zolpidem, flurazepam, temazepam, triazolam
- Bertisch SM, Herzig SJ, Winkleman JW et al. National use of prescription medications for insomnia, SLEEP 2014
- Trazodone: serotonin receptor antagonist and reuptake inhibitor(SARIs), most commonly used antidepressant and hypnotic agent.
- National use of prescription medication showed that Zolpidem and Trazodone were the two most commonly used med for insomnia from NHANES data.

Hypnotics used for insomnia in PTSD

- Anti-depressants:
Selective serotonin reuptake inhibitors (SSRI) like Sertraline, Fluoxetine, Paroxetine.
- Some antidepressants improve sleep disruption in PTSD whereas others are less beneficial and can cause adverse sleep events.
- Some anti-depressants can cause REM suppression and sleep fragmentation.
- SSRI and Venlafaxine have been found to exacerbate periodic leg movements during sleep.

Non-pharmacologic treatment

- Cognitive behavioral therapy specifically designed for PTSD related insomnia:
- Primary insomnia strategy:
- Sleep hygiene
- Sleep restriction
- Stimulus control
- Imagery rehearsal therapy (IRT)
- These sleep treatments may benefit patients with trauma related nightmares and insomnia.

Obstructive sleep apnea

- Prevalence of OSA is higher among veterans with PTSD than those without PTSD.
- 47.6% of combat veterans with PTSD was found to have OSA compared to 12.5% of healthy controls. ³
- There is a complex relationship between hyper-arousal from PTSD, insomnia and respiratory disturbance generated by special neuro-endocrine connections which are being explored in different basic and clinical studies.
- 3. Mellman TA, Kulick-Bell R, Ashlock LE et al. Sleep events among veterans with combat-related post traumatic stress disorder. Am J Psychiatry 1995

Symptoms of OSA

- Loud snoring
- Observed apneas-stopping breathing during sleep observed by someone
- Gasping/choking during sleep
- Day time sleepiness
- Excessive fatigue/tiredness not explained by other diseases
- Morning headaches
- Uncontrolled hypertension

Give me a break!



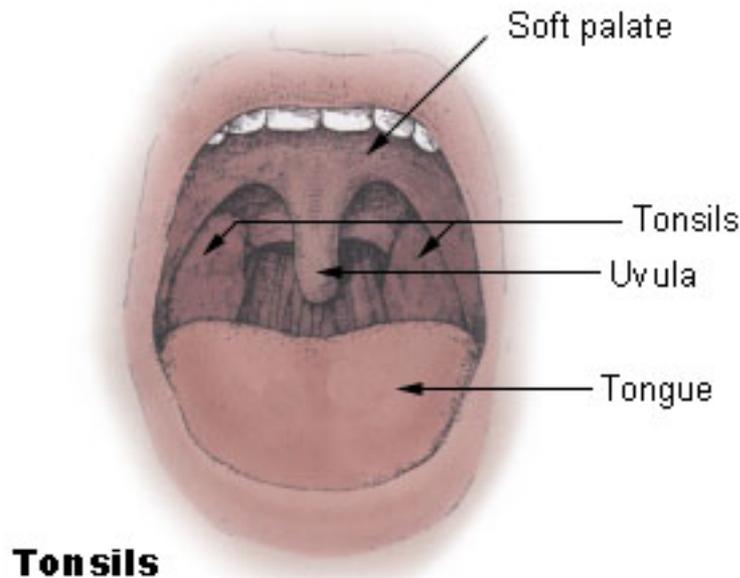
Diagnosis for sleep apnea

- **History:** Sleep hygiene, hypersomnolence by EPWORTH sleepiness score, observed breathing pauses, snoring

Physical Examination: neck size, mandibular position, oropharyngeal examination with Mallampati Score

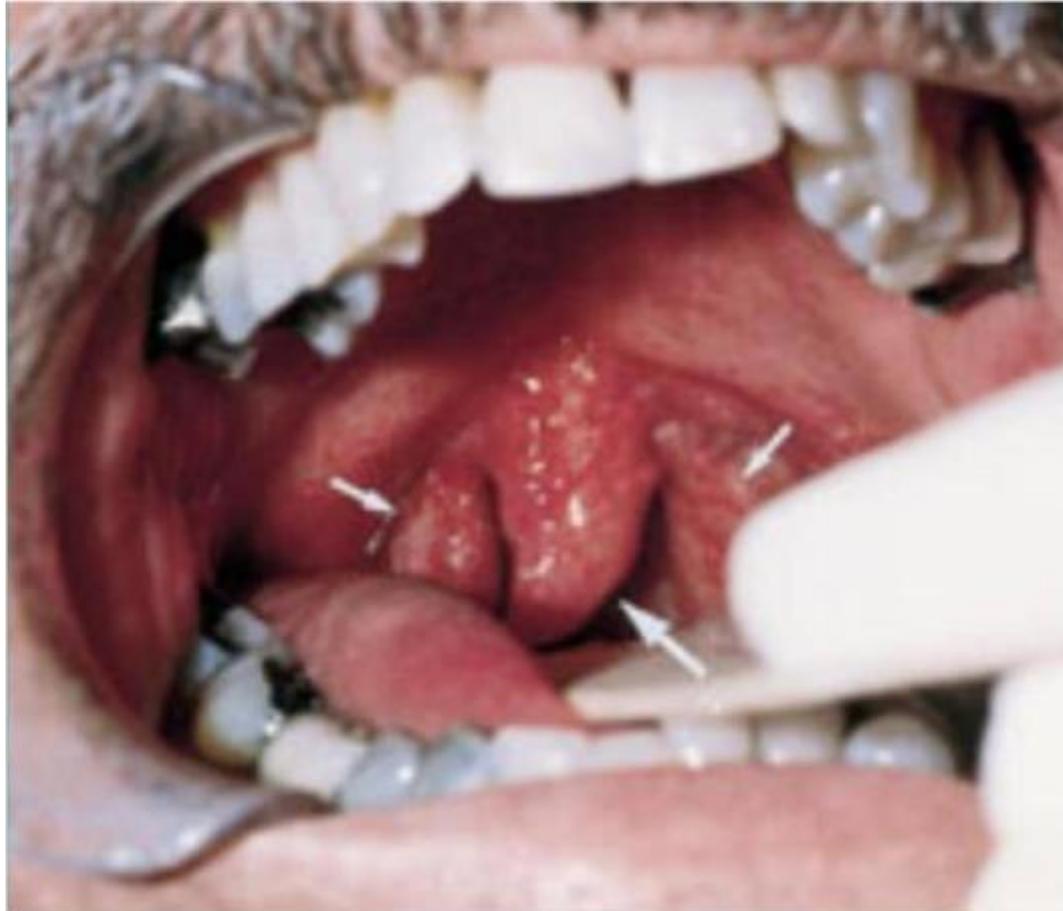
- **Overnight Polysomnography** (Gold standard)

Mallampati Score

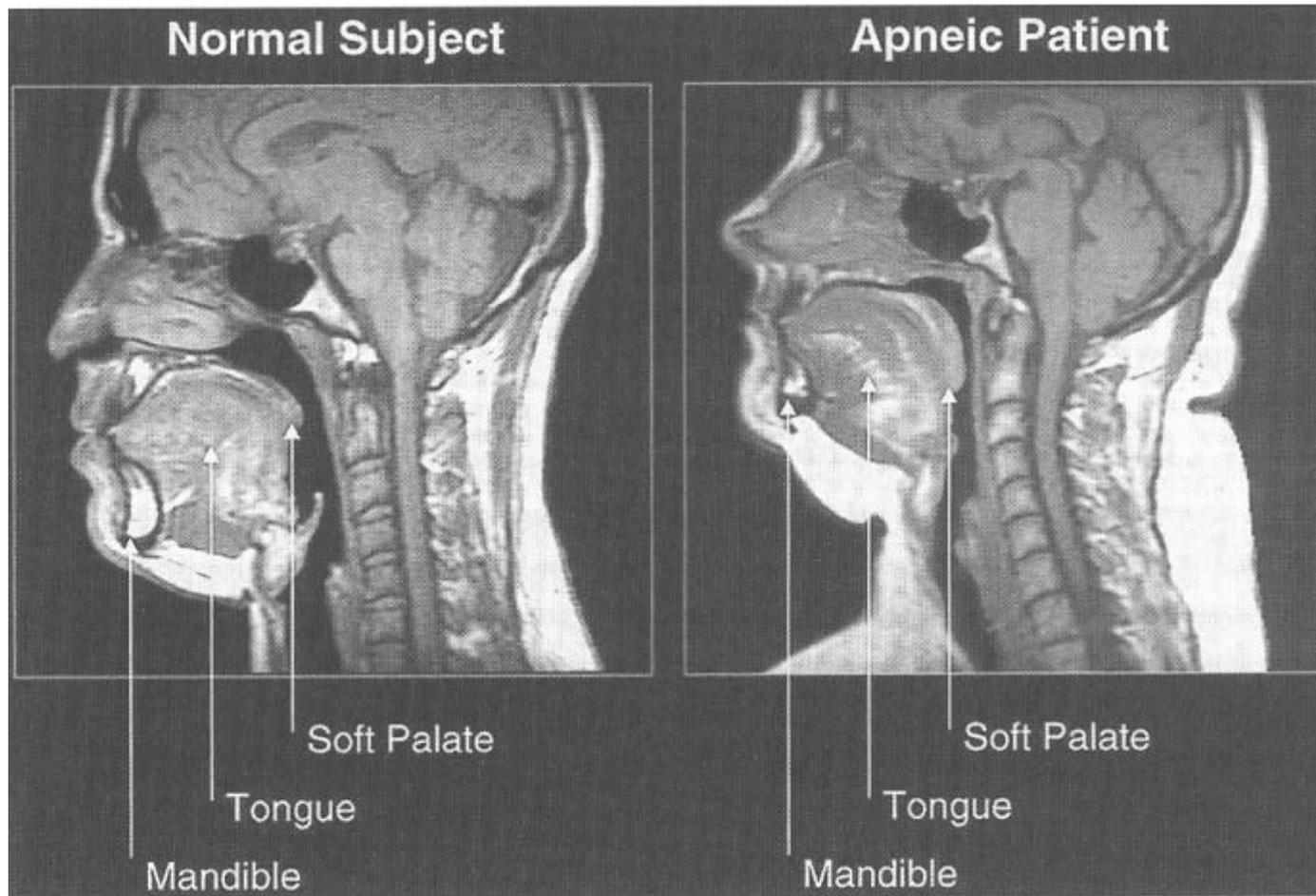


- Scoring is as follows:
Class 1: Full visibility of tonsils, uvula and soft palate
Class 2: Visibility of hard and soft palate, upper portion of tonsils and uvula
Class 3: Soft and hard palate and base of the uvula are visible
Class 4: Only Hard Palate visible

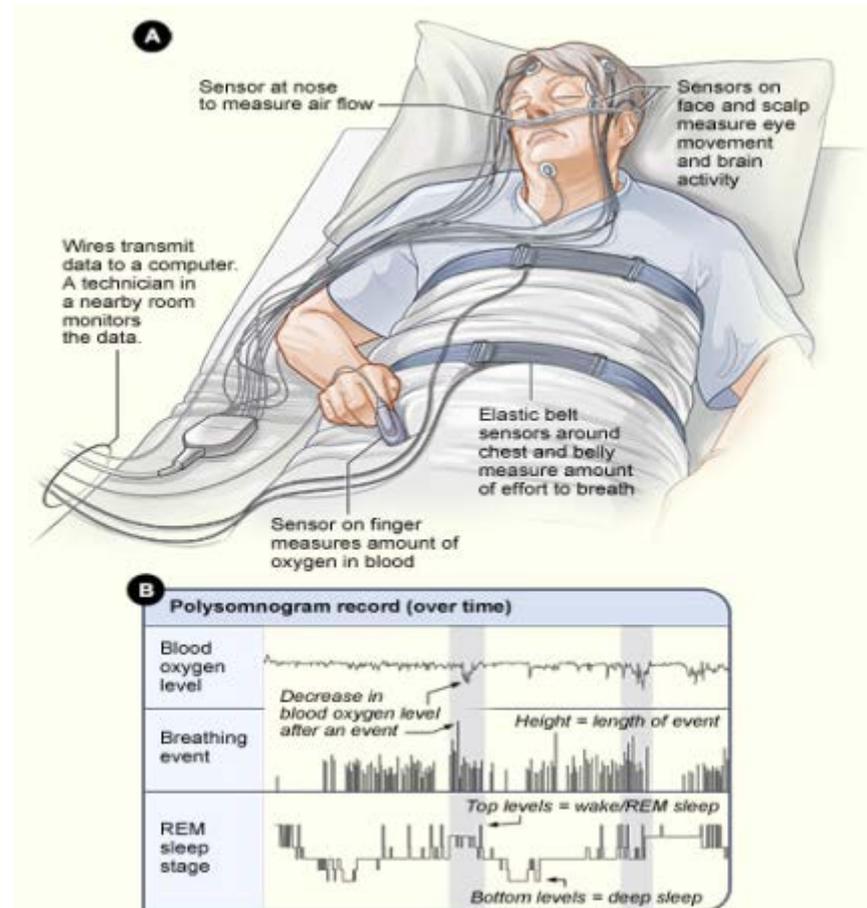
Oropharyngeal examination



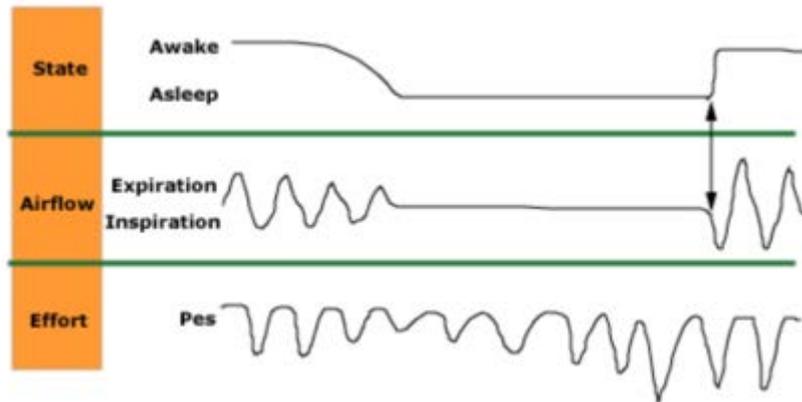
Sagittal section of a normal vs. OSA patient



What is polysomnography?

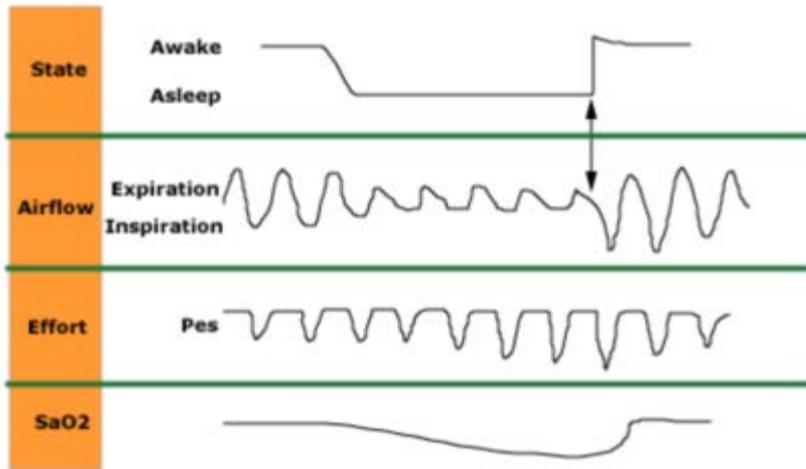


What is apnea?



- Complete cessation of airflow for 10 seconds or more during sleep is called apnea.

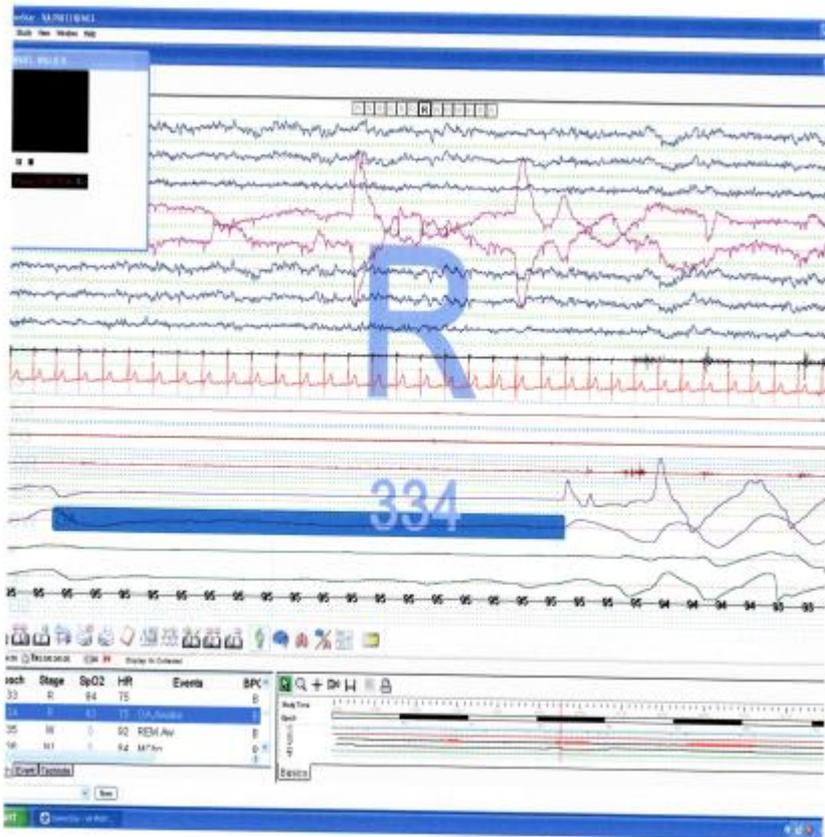
What is Hypopnea?



- Reduction of airflow by 50% with 4% reduction of oxygen saturation is termed as hypopnea.
- Total number of apnea and hypopnea per hour of sleep is calculated to generate apnea hypopnea index (AHI).

Diagnosis of OSA

- Three categories of OSA:
 - 1. Mild : AHI 5-15 with symptoms
 - 2. Moderate: AHI 15-30
 - 3. Severe: AHI >30



Treatment of OSA

- Continuous positive airway pressure therapy (CPAP) or Bi-level positive airway pressure therapy (BiPAP) is the gold standard of treatment for OSA.
- Surgical correction for increasing the oropharyngeal space is also used for therapy.
- Dental appliances and maxillofacial advancement are available therapy to use for OSA.

CPAP/BiPAP

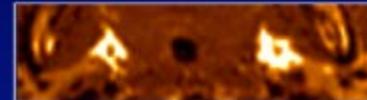
Sleeping with CPAP/BiPAP



How does it work?

CPAP Acts as an Airway Stent

0 cm H₂O



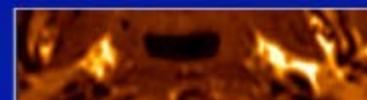
5 cm H₂O



10 cm H₂O



15 cm H₂O



Courtesy Richard Schwab, M.D. UPENN

How does CPAP/BiPAP help?

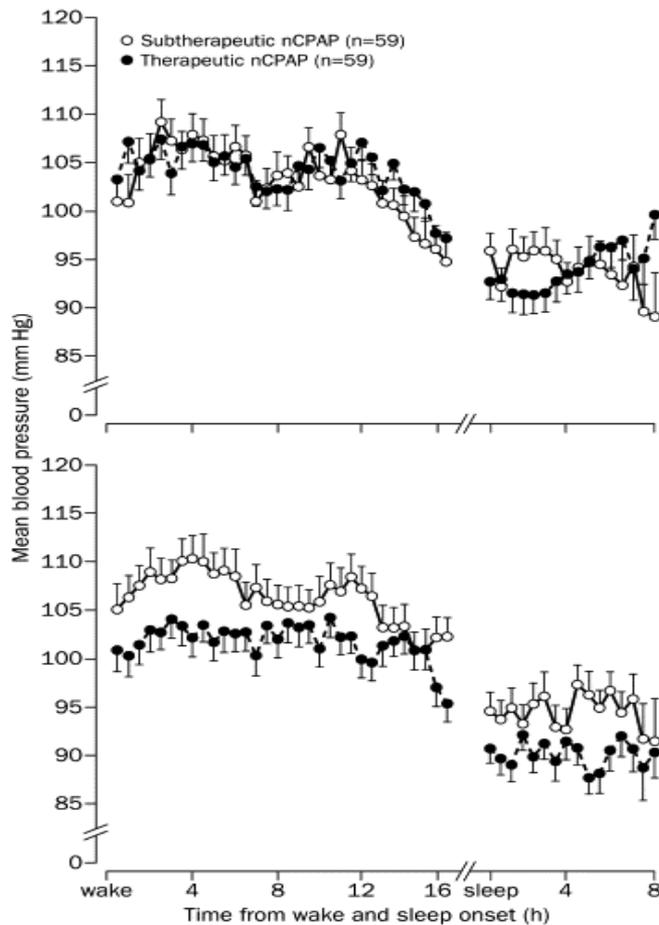
How does it help?

- Keeps airway open during sleep.
- Snoring and apneas should not happen or improve.
- Oxygen saturation during sleep will be normalized.
- Improves daytime sleepiness/tiredness
- Improves HTN

Reduces risk of diseases

- Improves neurocognitive functioning.
- Improves alertness.
- Reduces risk of cardiovascular diseases.
- Reduces motor vehicle accident
- Reduces headaches

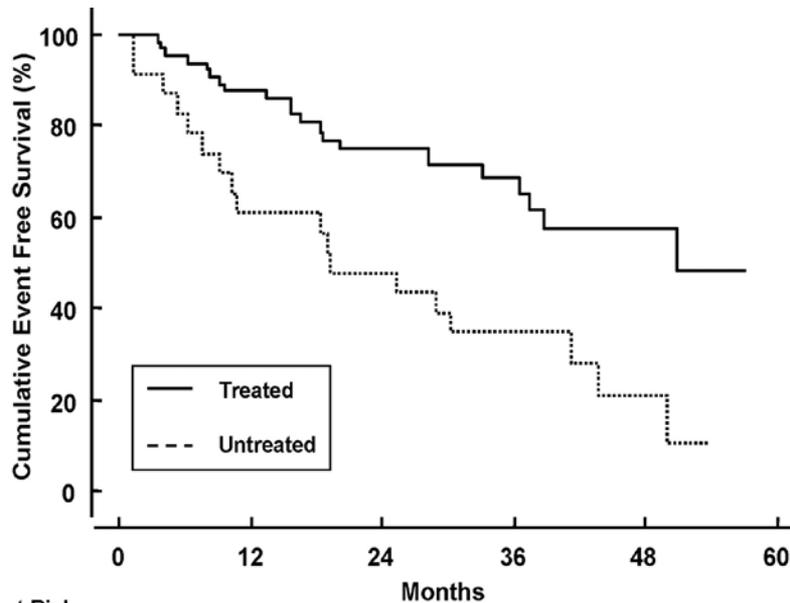
Improves HTN control



- A randomized trial on 118 men with severe OSA treated with optimal CPAP and subtherapeutic CPAP showed significant reduction in both SBP and DBP after 1 month in optimally treated group.

Improves Heart failure

- 88 patients with heart failure was grouped into CPAP treated and untreated group and their cumulative event-free survival was calculated over 25 months. The cumulative event-free survival was significantly lower in untreated patients than in CPAP-treated patients ($p = 0.001$ [log-rank test]).



Numbers at Risk

Treated	65	56	27	20	7
Untreated	23	14	11	6	2

Effect of CPAP on PTSD

- Improves nightmares
- Improves neurocognitive functioning and memory
- Improves insomnia and maintenance of sleep through the night.
- Treatment of co-morbid OSA alleviates PTSD symptoms
- Reduces night terrors, periodic leg movements and panic attacks during sleep.

Nightmares improve with CPAP

- Treatment of sleep apnea with CPAP has shown improvement on nightmares and PTSD symptoms in a retrospective study by Krakow and his colleagues in 2000.
- We retrospectively reviewed 69 veterans with PTSD at Jackson VAMC at MS and found a significant improvement in number of nightmares among PTSD sufferers who have used CPAP for their co-morbid OSA.
- *Krakow et al. A retrospective study in improvement in nightmares and PTSD following treatment of co-morbid sleep disordered breathing. Journal of Psychosomatic research, 2000*
- *Tamanna et al. CPAP therapy reduces nightmares in veterans with PTSD and sleep apnea, AASM meeting, 2013.*

CPAP compliance among PTSD

- CPAP compliance is very poor among veterans with PTSD
- CPAP adherence was compared between PTSD and non-PTSD group among veterans by El-Solh et al. in VAMC at New York. Veterans with PTSD were only 41% compared to veterans without PTSD who were 70% compliant for CPAP use.
- Claustrophobia is a major barrier for compliance among this group.
- *(El-Solh AA, Ayyar L, Akinnusi M et al. Positive airway pressure adherence in veterans with PTSD. SLEEP,2010)*

CPAP compliance

- Documentation of PAP therapy (>4 hours per night for 70% of the night in 30 consecutive days) is considered compliant by CMS.
- CPAP compliance has shown to improve to 86% by using a designated team of personnel for trouble shooting and fixing the issues.
- First 2 weeks compliance can predict the overall compliance of the patient.

Improving Compliance among PTSD veterans

- CPAP mask fitting and follow up with sleep provider are important.
- Offering different masks for trial will give them more options to try.
- Nasal masks and nasal pillows seem to work better for this group.
- Cognitive behavior therapy (CBT) for CPAP use has been found to be effective among non-compliant patients.
- *Richards S, Bartlett D, et al. Increased adherence to CPAP with a group cognitive behavioral treatment intervention: A randomized trial. SLEEP, 2007*

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- *Pepperell J.C., Ramdassingh-Dow S., Crosthwaite N., Mullins R., Jenkinson C., Stradling J.R., Davies R.J.; Ambulatory blood pressure after therapeutic and subtherapeutic nasal continuous positive airway pressure for obstructive sleep apnoea: a randomised parallel trial. Lancet. 359 2002:204-210.*