Sleep and Self-care Prevention for the Nurse

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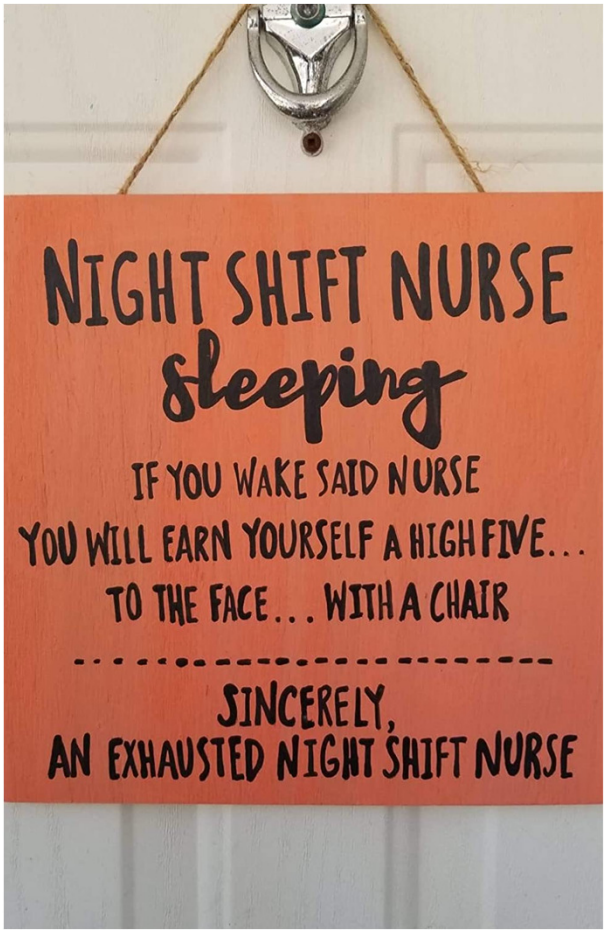


Disclosures

- *I serve as a consultant for both Respicardia® and Itamar Medical™*

Objectives

By the end of this presentation, you will be able to…

- Describe/Educate on Sleep Hygiene
- Describe/Educate on Sleep Disorders and its impact on overall health
- Describe and discuss occupation hazards for sleep deprivation in Nursing
- Discuss the contribution of sleep-disordered breathing to the development and progression of heart failure.
- Discuss types of sleep apnea, screening, testing and current treatment modalities

Sleep Hygiene

How Much Sleep Do I Need?

Age Group		Recommended Hours of Sleep Per Day [1.]
Newborn	0–3 months	14–17 hours (National Sleep Foundation) No recommendation (American Academy of Sleep Medicine)
Infant	4–12 months	12–16 hours per 24 hours (including naps)
Toddler	1–2 years	11–14 hours per 24 hours (including naps)
Preschool	3–5 years	10–13 hours per 24 hours (including naps)
School Age	6–12 years	9–12 hours per 24 hours
Teen	13–18 years	8–10 hours per 24 hours
Adult	**18–60 years**	**7 or more hours per night**
	61–64 years	**7–9 hours**
	65 years and older	**7–8 hours**

1.CDC. Gov

Factors That Impact Sleep Quality

- Sleep environment sleep habits' (traffic/television noise, room temperature, excessive lighting, irregular sleep schedule, and changes in sleep hours
- Emotional stress (e.g., nervousness, hostility, anxiety, and depression)
- Eating habits (e.g., diet, consumption of drinks with caffeine and/or alcohol, and tobacco use;
- Exercise (e.g., inactivity, exercise with inappropriate intensity/duration, and lack of aerobic exercise;
- Physiologic changes (e.g., changes in neuroendocrine hormones, body temperature, pregnancy; menopause; and disease symptoms)

What is Sleep Hygiene

- Strong sleep hygiene means having both a bedroom environment and daily routines that promote consistent, uninterrupted sleep.
- Keeping a stable sleep schedule, making your bedroom comfortable and free of disruptions
- Following a relaxing pre-bed routine
- Building healthy habits during the day can all contribute to ideal sleep hygiene.

The 10 Sleep Hygiene Commandments

1. Exercise regularly ☐
2. Get sunlight during the day ☐
3. Keep your bedroom cool, dark and comfortable ☐
4. Don't go to bed too hungry or too full ☐
5. Avoid excessive liquid consumption in the evening ☐
6. No caffeine, nicotine or alcohol near bedtime ☐
7. Don't go to bed angry, worried or upset ☐
8. Avoid digital devices in the bedroom and don't use your phone as an alarm clock ☐
9. Don't nap too long or too late during the day ☐
10. Set regular schedule for sleep and stick to it even during weekends and holidays ☐

HappyMaven

Sleep Disorders and its impact on overall health

Unmet Public Health Problem

- It is estimated 50 to 70 million Americans suffer from a chronic disorder of sleep and wakefulness.
- Billions of dollars annually are spent on direct medical costs hospital services, prescriptions, and over-the-counter medications.
- Nearly 20% of all serious MVA in the general population are associated with driver sleepiness, independent of alcohol effects.
- However, given this burden, awareness among the general public and health care professionals is low.
- **The current clinical and scientific workforce is not sufficient to diagnose and treat individuals with sleep disorders.**

http://www.nap.edu/catalog/11617.html

The cumulative long-term effects of sleep deprivation and sleep disorders have been associated with a wide range of deleterious outcomes, to include increased risk of hypertension, diabetes, obesity, depression, heart attack, and stroke.

The majority of people with sleep disorders are frequently under diagnosed. Compared to healthy individuals, those suffering from sleep loss and sleep disorders are less productive, have an increased health care utilization, and have an increased likelihood of injury

Occupation Hazards for Sleep Deprivation in Nursing

Shift Work

- Shift work is a significant health risk factor in nursing
- Disruption of sleep-wake cycle in shift workers causes symptoms such as fatigue, drowsiness, insomnia, digestive problems, irritability, decreased mental activity, and degradation of individual performance.
- Work productivity and safety in night shift is at its lowest
- Shift work increases the risk of some diseases in long-term. These include the risk of cardiovascular disease, diabetes, mood disorders, and cancers.
- One of the most common problems in shift workers is shift work sleep disorders (SWSD)

Yazdi Z, Jalilolghadr S, Tootoonchian F. J Sleep Sci 2017

SWSD'S

SWSDs are caused by disruption of circadian rhythm of sleep and wake and are characterized by excessive daytime sleepiness and insomnia.

The prevalence of SWSDs is more than 30% in shift workers and its prevalence increase with aging

Due to the high prevalence of SWSDs, research has been aimed at training shift workers appropriate sleep hygiene.

Tips to improve sleep and alertness

Get some exercise and eat light, healthy meals and snacks during your shift.

Keep the work environment brightly lit

After a night shift, wear sunglasses or amber-tinted glasses when outside.

To reduce the potential for drowsy driving, get a ride, take a cab or public transit, or use a ridesharing service.

Avoid caffeine.

Prioritize your sleep: avoid running errands or doing chores after your shift.

Never use alcohol as a sleep aid

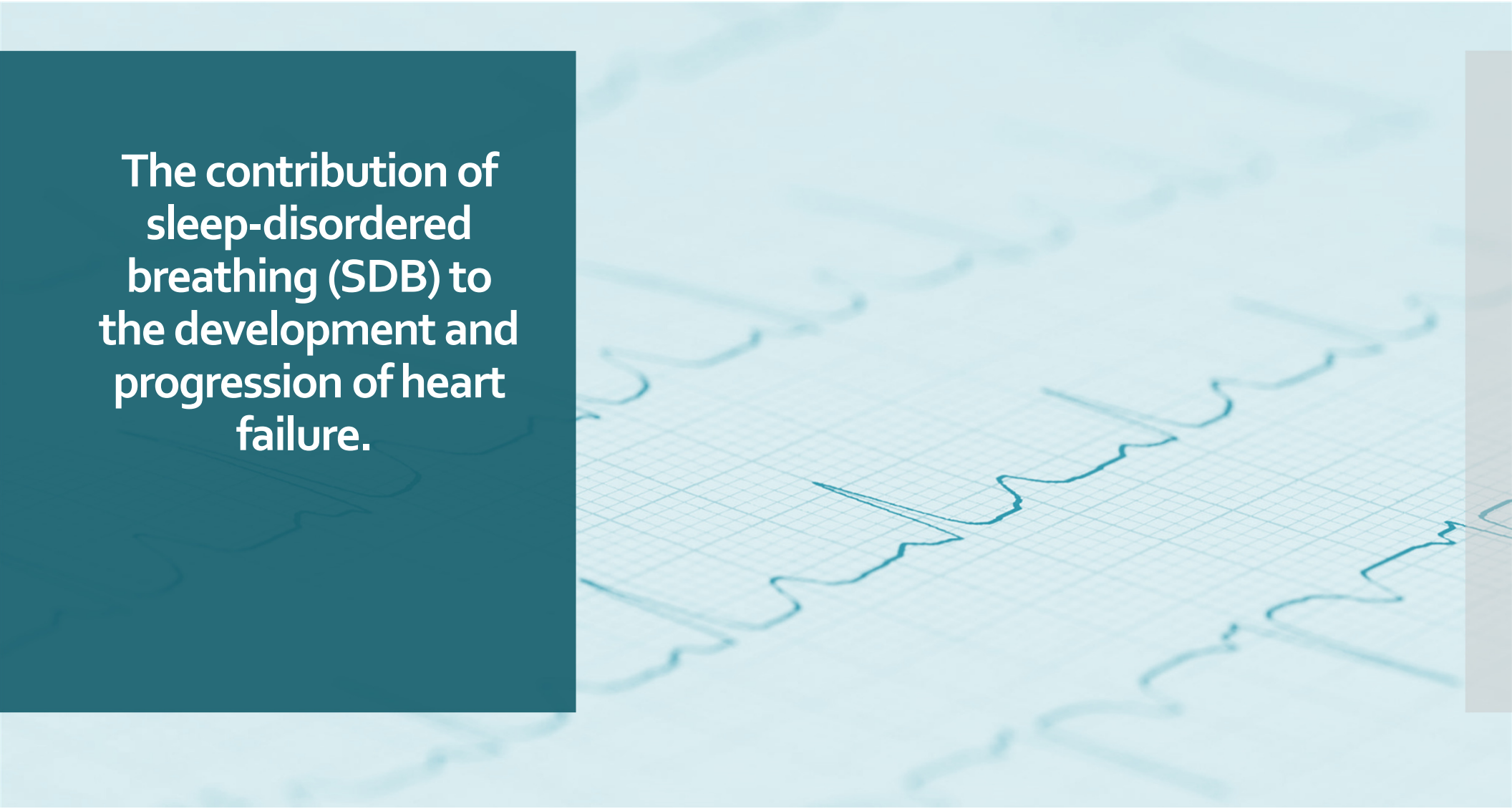
Turn off mobile devices before going to bed

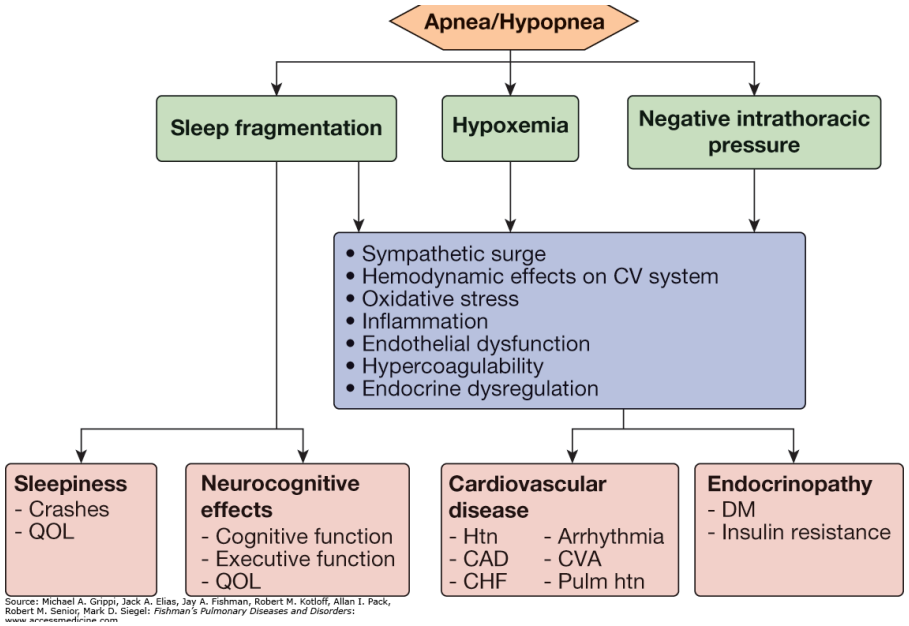
Are you putting yourself at risk?

- Given the large numbers of nurses who report struggling to stay awake when driving home from work and the frequency with which nurses reported drowsy driving, greater attention should be paid to increasing nurse awareness of the risks and to implementing strategies to prevent drowsy driving episodes to ensure public safety.
- **Without mitigation, fatigued nurses will continue to put the public and themselves at risk.**

Scott,Hwang,Rogers,Nysse,Dean; Dinges *SLEEP* 2007

The contribution of sleep-disordered breathing (SDB) to the development and progression of heart failure.

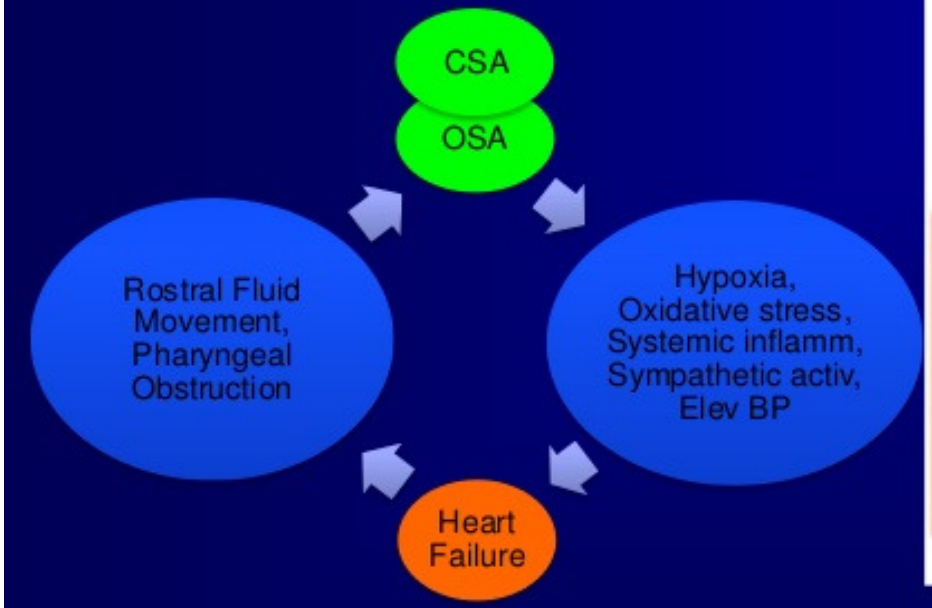


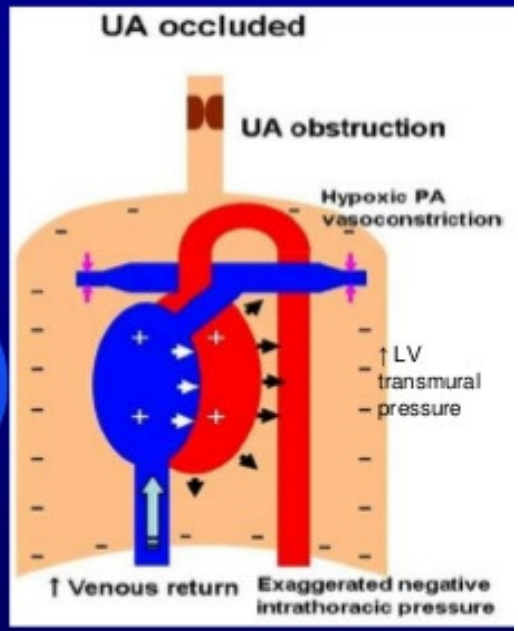


Source: Michael A. Grippi, Jack A. Elias, Jay A. Fishman, Robert M. Kotloff, Allan I. Pack, Robert M. Senior, Mark D. Siegel: *Fishman's Pulmonary Diseases and Disorders*:

Systemic Effects of SDB

Sleep Apnea Syndromes and HF





Duke Clinical Research Institute
DUKE UNIVERSITY MEDICAL CENTER

Mentz RJ, et al. Heart Fail Clin 2013
Kasai T, J Am Coll Cardiol. 2011;57(2):119-27.

JACC: HEART FAILURE
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Prevalence and Predictors of Sleep-Disordered Breathing in Patients With Stable Chronic Heart Failure

The SchlaHF Registry

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TABLE 4 Risk Factors for SDB in Chronic Heart Failure

First Author, Year (Ref.)	Setting	Patients (n)	Source of Patients	SDB Diagnosis	Female, n (%)	ß-Blocker (%)	Spironolactone (%)	Risk Factors for SDB
Sin et al., 1999 (13)	Single center	450	Sleep laboratory referrals	PSG	68 (15)	0	0	CSA: male, age ≥60 yrs, Pco_2 ≤38 mm Hg, AF OSA: BMI (men); age (women)
Yumino et al., 2009 (14)	Single center	218	Heart failure clinic	PSG	50 (23)	75	21	CSA: male, age, AF, lower Pco_2, diuretic use OSA: male, age, BMI
MacDonald et al., 2008 (26)	Single center	108	Heart failure clinic	SDB-screening device	16 (15)	82	36	SDB: AF, NYHA functional class
Arzt et al. (SchlaHF)	Multicenter	6,876	Cardiology practices and hospital departments	SDB-screening device	1,448 (21)	89	47	SDB: Male, age, BMI, LVEF, AF (no sex differences for significant risk factors)

AF = atrial fibrillation; CSA = central sleep apnea; OSA = obstructive sleep apnea; Pco_2 = carbon dioxide pressure; PSG = polysomnography; pts = patients; SchlaHF = Sleep-Disordered Breathing in Heart Failure; other abbreviations as in Table 1.

Types of Sleep Apnea

Complex

Controversy remains as to whether complex sleep apnea represents an independent and sustained sleep related breathing disorder, or whether it is a temporary occurrence that eventually abates with continued PAP therapy.

Further studies to resolve this debate are warranted*

Sleep Apnea is an Interruption in Breathing During Sleep

*American Academy of Sleep Medicine, 2016

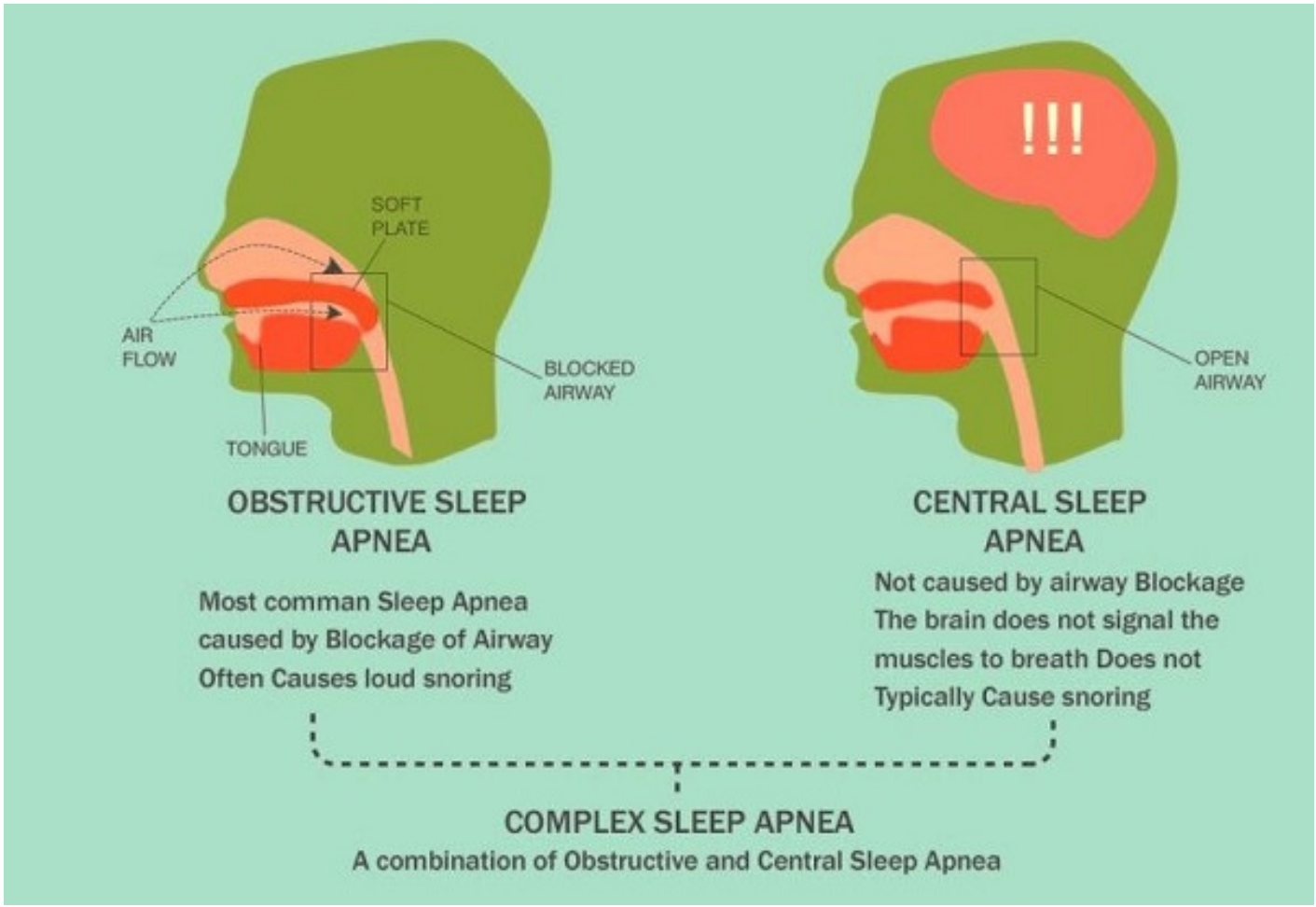

SOFT
PLATE
AIR
FLOW
BLOCKED
AIRWAY
TONGUE
!!!
OPEN
AIRWAY
OBSTRUCTIVE SLEEP
APNEA
Most comman Sleep Apnea
caused by Blockage of Airway
Often Causes loud snoring
CENTRAL SLEEP
APNEA
Not caused by airway Blockage
The brain does not signal the
muscles to breath Does not
Typically Cause snoring
COMPLEX SLEEP APNEA
A combination of Obstructive and Central Sleep Apnea

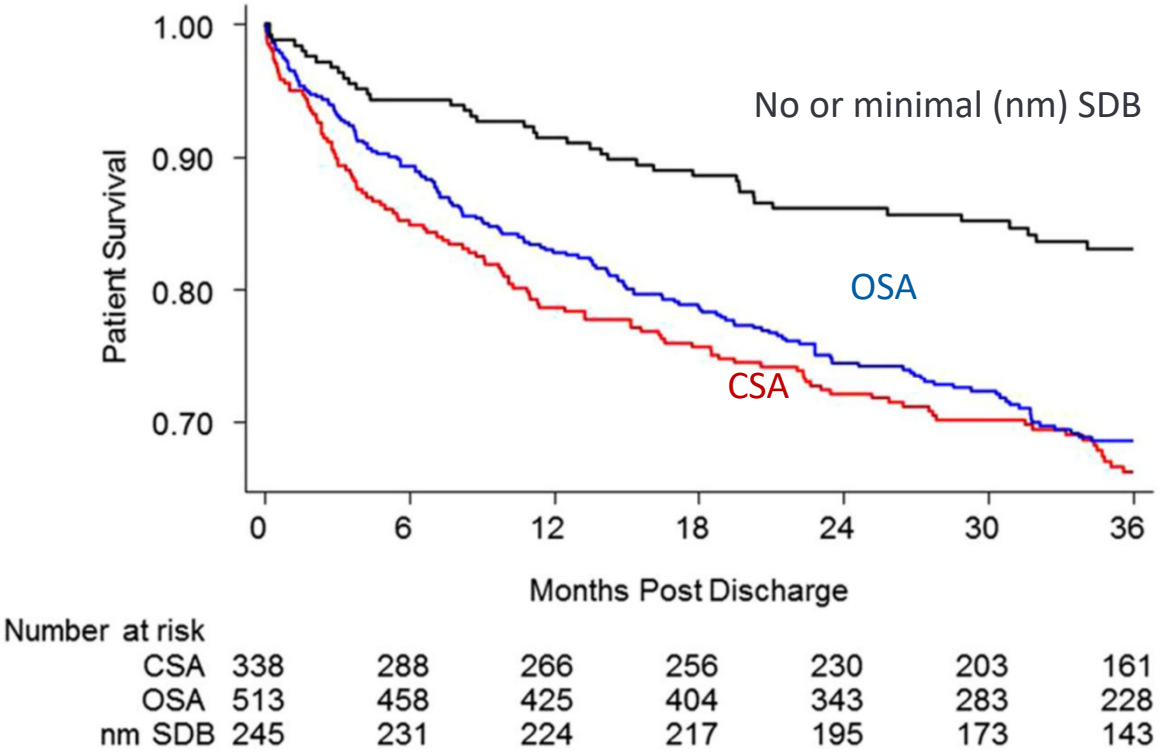
TABLE 1.

Definition of Sleep-Related Breathing Disorders

Apnea	Cessation of airflow for at least 10 seconds or more
Hypopnea	Reduction of airflow with resultant oxygen desaturation of ≥4%
Apnea-hypopnea index	Average frequency of apnea and hypopnea events per hour of sleep
Obstructive sleep apnea	AHI of ≥15 or ≥5 associated symptoms such as excessive daytime sleepiness, impaired cognition, mood disorders, insomnia, hypertension, heart disease, or history of stroke
Central sleep apnea	AHI of ≥5 or ≥50% of the respiratory events occurring without any inspiratory effort—associated with symptoms of either excessive daytime sleepiness or disrupted sleep

Note: It is the presence of inspiratory effort during apneas and hypopneas that distinguishes predominantly obstructive sleep apnea

Survival – Heart failure (LVEF< 45%) with CSA patients vs. heart failure with normal breathing in NIH sponsored study

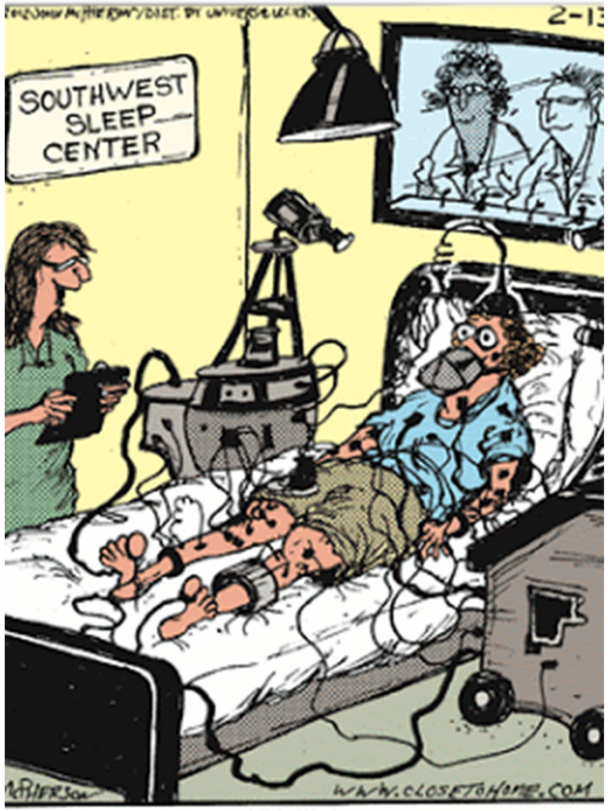


HF combined with CSA is associated with a 2-fold increase in risk of death

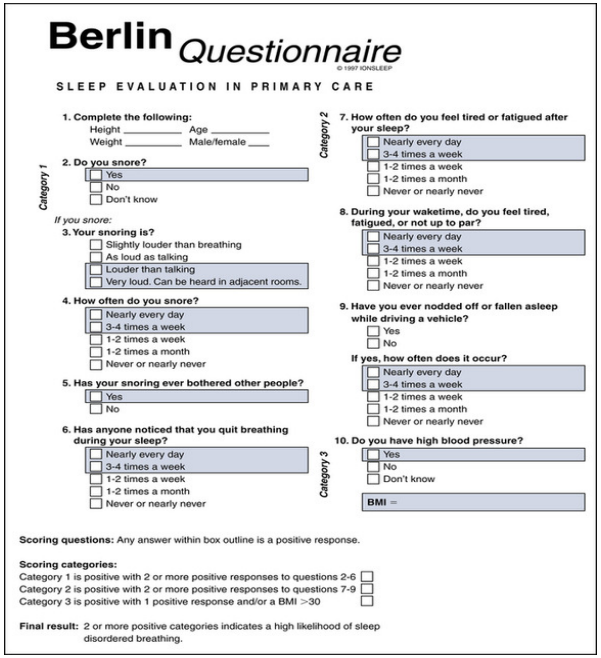
Hazard ratios	
CSA vs. no or minimal SDB	OSA vs. no or minimal SDB
2.17 $p < 0.001$	**2.00 $p < 0.001$**

Khayat et al. Eur Heart J 2015; 36:1463-9

Screening, Testing and New Therapy Options ….oh my!



"OK, Mrs. Tully. We want you to relax, get a good night's sleep, and we'll evaluate any sleep issues that you have."



Berlin *Questionnaire*

© 1997 IONSLEEP

SLEEP EVALUATION IN PRIMARY CARE

1. Complete the following:
Height _____ Age _____
Weight _____ Male/female ___

Category 1

2. Do you snore?
- ☐ Yes
- ☐ No
- ☐ Don't know

If you snore:

3. Your snoring is?
- ☐ Slightly louder than breathing
- ☐ As loud as talking
- ☐ Louder than talking
- ☐ Very loud. Can be heard in adjacent rooms.

4. How often do you snore?
- ☐ Nearly every day
- ☐ 3-4 times a week
- ☐ 1-2 times a week
- ☐ 1-2 times a month
- ☐ Never or nearly never

5. Has your snoring ever bothered other people?
- ☐ Yes
- ☐ No

6. Has anyone noticed that you quit breathing during your sleep?
- ☐ Nearly every day
- ☐ 3-4 times a week
- ☐ 1-2 times a week
- ☐ 1-2 times a month
- ☐ Never or nearly never

Category 2

7. How often do you feel tired or fatigued after your sleep?
- ☐ Nearly every day
- ☐ 3-4 times a week
- ☐ 1-2 times a week
- ☐ 1-2 times a month
- ☐ Never or nearly never

8. During your waketime, do you feel tired, fatigued, or not up to par?
- ☐ Nearly every day
- ☐ 3-4 times a week
- ☐ 1-2 times a week
- ☐ 1-2 times a month
- ☐ Never or nearly never

9. Have you ever nodded off or fallen asleep while driving a vehicle?
- ☐ Yes
- ☐ No

If yes, how often does it occur?
- ☐ Nearly every day
- ☐ 3-4 times a week
- ☐ 1-2 times a week
- ☐ 1-2 times a month
- ☐ Never or nearly never

Category 3

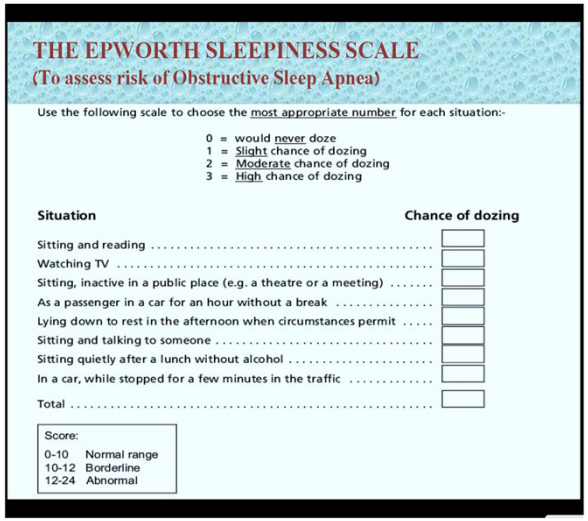
10. Do you have high blood pressure?
- ☐ Yes
- ☐ No
- ☐ Don't know

BMI =

Scoring questions: Any answer within box outline is a positive response.

Scoring categories:
Category 1 is positive with 2 or more positive responses to questions 2-6 ☐
Category 2 is positive with 2 or more positive responses to questions 7-9 ☐
Category 3 is positive with 1 positive response and/or a BMI >30 ☐

Final result: 2 or more positive categories indicates a high likelihood of sleep disordered breathing.



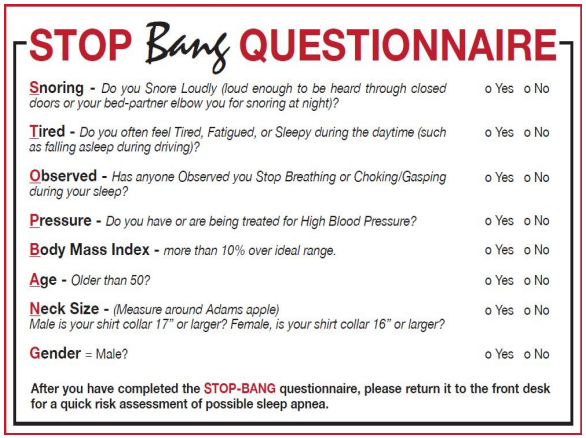
THE EPWORTH SLEEPINESS SCALE
(To assess risk of Obstructive Sleep Apnea)

Use the following scale to choose 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

Situation	Chance of dozing
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 the traffic	
Total	

Score:
0-10 Normal range
10-12 Borderline
12-24 Abnormal



STOP *Bang* QUESTIONNAIRE

Snoring - *Do you Snore Loudly (loud enough to be heard through closed doors or your bed-partner elbow you for snoring at night)?*	o Yes o No
Tired - *Do you often feel Tired, Fatigued, or Sleepy during the daytime (such as falling asleep during driving)?*	o Yes o No
Observed - *Has anyone Observed you Stop Breathing or Choking/Gasping during your sleep?*	o Yes o No
Pressure - *Do you have or are being treated for High Blood Pressure?*	o Yes o No
Body Mass Index - *more than 10% over ideal range.*	o Yes o No
Age - *Older than 50?*	o Yes o No
Neck Size - *(Measure around Adams apple) Male is your shirt collar 17" or larger? Female, is your shirt collar 16" or larger?*	o Yes o No
Gender = Male?	o Yes o No

After you have completed the STOP-BANG questionnaire, please return it to the front desk for a quick risk assessment of possible sleep apnea.

Pre-Screening Tools – What is the right questionnaire?

Sleep Apnea HURTS HEARTS!

It is especially important for patients in high-risk groups to be screened using a validated OSA questionnaire (e.g., STOP-BANG or Berlin).

Because:

"Sleep Apnea Hurts HEARTS," the American Academy of Sleep Medicine recommends an annual screening for all adult patients who have:

H – heart failure
E – elevated blood pressure
A – atrial fibrillation (A-fib)
R – resistant hypertension
T – Type 2 diabetes
S – stroke

2017 ACC/AHA/HFSA Focused Guideline Update

9.6. Sleep-Disordered Breathing: Recommendations

(Moved from Section 7.3.1.4, Treatment of Sleep Disorders in the 2013 HF guideline.)

Recommendations for Treatment of Sleep Disorders

COR	LOE	RECOMMENDATIONS	COMMENT/RATIONALE
IIa	C-LD	In patients with NYHA class II–IV HF and suspicion of sleep-disordered breathing or excessive daytime sleepiness, a formal sleep assessment is reasonable (200,201).	NEW: Recommendation reflects clinical necessity to distinguish obstructive versus central sleep apnea.
See Online Data Supplement G.			

Sleep disorders are common in patients with HF. A study of adults with chronic HF treated with evidence-based therapies found that 61% had either central or obstructive sleep apnea (202). It is clinically important to distinguish obstructive sleep apnea from central sleep apnea, given the different responses to treatment. Adaptive servo-ventilation for central sleep apnea is associated with harm (203). Continuous positive airway pressure (CPAP) for obstructive sleep apnea improves sleep quality, reduces the apnea-hypopnea index, and improves nocturnal oxygenation (200,201).

IIb	B-R	In patients with cardiovascular disease and obstructive sleep apnea, CPAP may be reasonable to improve sleep quality and daytime sleepiness (204).	NEW: New data demonstrate the limited scope of benefit expected from CPAP for obstructive sleep apnea.
See Online Data Supplement G.			

In patients with sleep apnea, a trial evaluated the impact of CPAP with usual therapy versus usual therapy alone on subsequent cardiovascular events, including HF (204). In this RCT of >2,700 patients, there was no evidence of benefit on cardiovascular events at a mean follow-up of 3.7 years for CPAP plus usual care compared with usual care alone. Improvements in sleep quality were noteworthy and represented the primary indication for initiating CPAP treatment (204). However, in patients with atrial fibrillation (AF) (a frequent comorbidity noted with HF), the use of CPAP for obstructive sleep apnea was helpful. In a trial of 10,132 patients with AF and obstructive sleep apnea, patients on CPAP treatment were less likely to progress to more permanent forms of AF than were patients without CPAP (205).

III: Harm	B-R	In patients with NYHA class II–IV HFrEF and central sleep apnea, adaptive servo-ventilation causes harm (203).	NEW: New data demonstrate a signal of harm when adaptive servo-ventilation is used for central sleep apnea.
See Online Data Supplement G.			

Mortality rate (all cause and cardiovascular) was higher with adaptive servo-ventilation plus GDMT than with GDMT alone in a single RCT to test the

Testing Recommendations for suspected Sleep Apnea

1. (Strong) Use of clinical tools or questionnaires to help diagnose, specifically in the absence of recent PSG or HST
2. (Strong) Testing with either PSG or HST be used to diagnose OSA in the uncomplicated adult patient with increased risk profile for OSA
3. (Strong) If a single home study test is negative, inconclusive or technically inadequate repeat PSG for confirmation of diagnosis of OSA

Recommendation Statement	Strength of Recommendation	Evidence Quality	Benefits versus Harms	Patient Values and Preferences
1. We recommend that clinical tools, questionnaires or prediction algorithms not be used to diagnose OSA in adults, in the absence of PSG or HSAT.	Strong	Moderate	High certainty that harms outweigh benefits	Vast majority of well-informed patients would most likely not choose clinical tools, questionnaires or prediction algorithms for diagnosis
2. We recommend that PSG, or HSAT with a technically adequate device, be used for the diagnosis of OSA in uncomplicated adult patients presenting with signs and symptoms that indicate an increased risk of moderate to severe OSA.	Strong	Moderate	High certainty that benefits outweigh harms	Vast majority of well-informed patients would want PSG or HSAT
3. We recommend that if a single HSAT is negative, inconclusive or technically inadequate, PSG be performed for the diagnosis of OSA.	Strong	Low	High certainty that benefits outweigh harms	Vast majority of well-informed patients would want PSG performed if the initial HSAT is negative, inconclusive, or technically inadequate
4. We recommend that PSG, rather than HSAT, be used for the diagnosis of OSA in patients with significant cardiorespiratory disease, potential respiratory muscle weakness due to neuromuscular condition, awake hypoventilation or suspicion of sleep related hypoventilation, chronic opioid medication use, history of stroke or severe insomnia.	Strong	Very Low	High certainty that benefits outweigh harms	Vast majority of well-informed patients would most likely choose PSG to diagnose suspected OSA
5. We suggest that, if clinically appropriate, a split-night diagnostic protocol, rather than a full-night diagnostic protocol for PSG be used for the diagnosis of OSA.	Weak	Low	Low certainty that benefits outweigh harms	Majority of well-informed patients would most likely choose a split-night diagnostic protocol to diagnose suspected OSA
6. We suggest that when the initial PSG is negative, and there is still clinical suspicion for OSA, a second PSG be considered for the diagnosis of OSA.	Weak	Very low	Low certainty that benefits outweigh harms	Majority of well-informed patients would most likely choose a second PSG to diagnose suspected OSA when the initial PSG is negative and there is still a suspicion that OSA is present

Current Testing Guidelines

American Academy of Sleep Medicine 2017

Home Sleep Testing

Diagnostic Options in the Setting of a Pandemic

Home Sleep Testing

HST is an alternative to PSG in the diagnosis of potentially both obstructive and central sleep apnea.

Patients can be evaluated in their own habitual environment rather than in a sleep lab.

The use of HST provides a less stress-inducing option for patients and a more financially efficient method for the evaluation of SAS.

One HST test option utilizes the peripheral arterial signal testing measuring (peripheral arterial tonometry, heart rate, oximetry, actigraphy, body position, snoring and chest motion) via three points of contact (wrist, finger and chest).

What is Home Sleep Testing?

Diagnostic Capabilities

Sleep Study Report

Sleep Summary

Start Study Time:	2:40:16 AM
End Study Time:	7:45:05 AM
Total Recording Time:	5 hrs, 4 min
Total Sleep Time	**4 hrs, 25 min**
% REM of Sleep Time:	14.2

Respiratory Indices

	Total Events	REM	NREM	All Night
pRDI:	34	9.7	7.4	**7.7**
pAHI:	32	8.0	7.1	**7.3**
ODI:	8	3.2	1.6	**1.8**
pAHIc:	0	0.0	0.0	**0.0**
% CSR:	0.0			

Indices are calculated using technically valid sleep time of 4 hrs, 24 min.

pRDI/pAHI are calculated using oxi desaturations ≥ 3%

Oxygen Saturation Statistics

Mean: 93 Minimum: 87 Maximum: 98

Mean of Desaturations Nadirs (%): 91

Oxygen Desatur. %:	**4-9**	**10-20**	**>20**	**Total**
Events Number	8	0	0	8
Total	100.0	0.0	0.0	100.0

Oxygen Saturation:	**<90**	**<=88**	**<85**	**<80**	**<70**
Duration (minutes):	2.6	0.4	0.0	0.0	0.0
Sleep %	1.0	0.1	0.0	0.0	0.0

Pulse Rate Statistics during Sleep (BPM)

Mean: 46 Minimum: 40 Maximum: 83

Sleep Study Report

Body Position Statistics

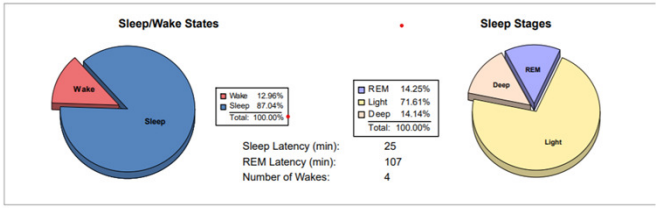
Position	Supine	Prone	Right	Left	Non-Supine
Sleep (min)	189.5	16.3	23.0	36.5	75.8
Sleep %	71.4	6.1	8.7	13.8	28.6
pRDI	9.2	3.8	10.5	0.0	4.0
pAHI	8.9	3.8	7.9	0.0	3.2
ODI	2.5	0.0	0.0	0.0	0.0

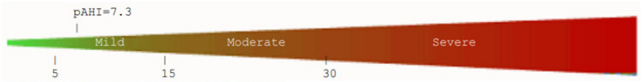
Snoring Statistics

Snoring Level (dB)	>40	>50	>60	>70	>80	>Threshold (45)
Sleep (min)	18.6	2.8	0.9	0.1	0.0	5.1
Sleep %	7.0	1.0	0.3	0.0	0.0	1.9

Mean: 40 dB

Sleep Stages Chart





* Reference values are according to AASM guidelines

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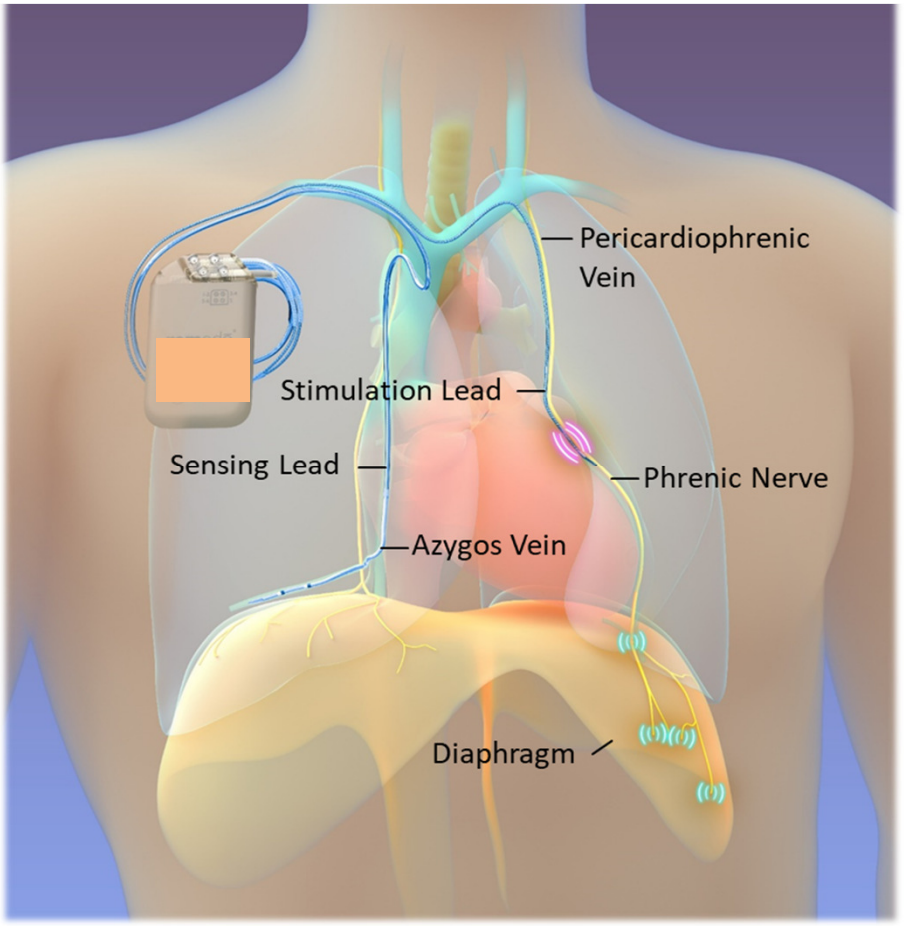
Limited Treatment Options for **Central Sleep** Apnea

CPAP	• Most common CSA treatment • Clinical trials demonstrated improvement in AHI and EF • CANPAP showed no improvement in QoL or M&M and was stopped early for safety • Does not have an FDA approved indication to treat CSA
ASV (Adaptive servo-ventilation)	• Largest randomized study in CSA (SERVE-HF n=1325) • Showed and improvement in AHI but no improvement in QoL • No difference in M&M, but increased cardiovascular mortality in patients with EF < 45% • **Black box warning** and Class III recommendation against use in patients with EF < 45%
Oxygen Therapy	• Small randomized studies show improvement in AHI, but no improvements in arousals or daytime sleepiness • Does not have a FDA approved indication to treat CSA
Medications • Theophylline • Acetazolamide	• Both studied in short (<3 month) studies with < 20 patients • Does not have a FDA approved indication to treat CSA

- Aurora et al. J Clin Sleep Med 2016; 12:757-761

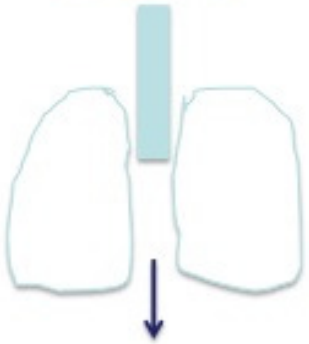
Transvenous phrenic nerve stimulation Therapy

- **Fully implantable system** with an indication to treat moderate to severe central sleep apnea in adults; received U.S. FDA PMA approval October 2017
- **Stabilizes breathing** by activating the diaphragm to generate negative pressure in the chest (similar to natural breathing)
- **Turns on automatically at night,** ensuring nightly compliance and adherence over time
- Implanted by cardiac electrophysiologists (EPs)
  - **Pulse generator** implanted below clavicle
  - **Stimulation lead** placed either in left pericardiophrenic or right brachiocephalic vein
  - **Sensing lead** placed in the Azygos vein, helps optimize therapy (optional)



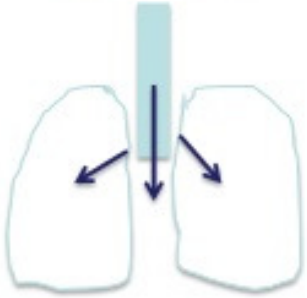
Comparison of Normal Inspiration with CSA Therapies

Normal Breathing



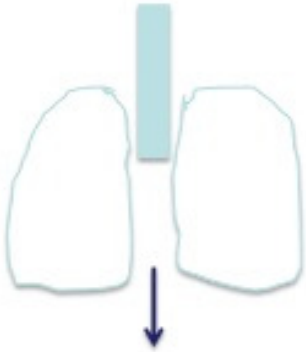
Diaphragm ***pulls*** air into the lungs

Mask Therapies (ASV, CPAP)



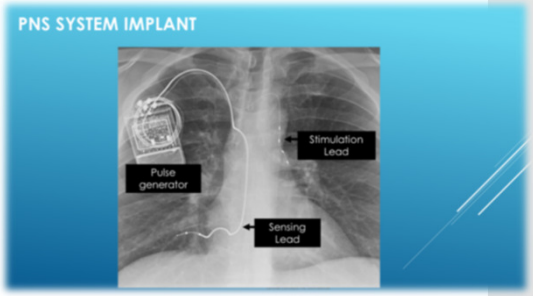
Ventilation ***pushes*** air into the lungs via positive intrathoracic pressure

PNS Therapy



PNS Therapy

pulls air into the lungs using the same mechanism of action as normal breathing



Courtesy William Abraham

Continuous Pulmonary Airway Pressure Support

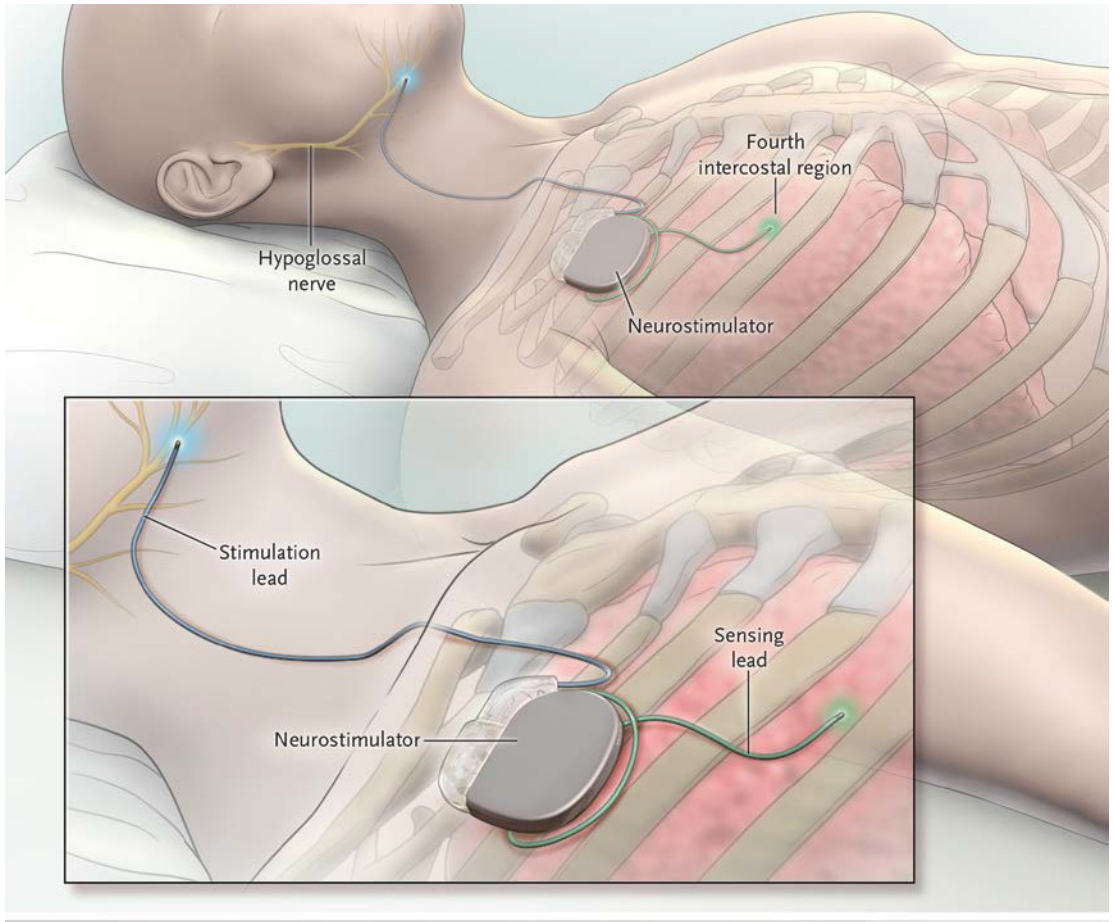
CPAP – Front Line Treatment for OSA

Great Results When Used Regularly

However…Some patient's can't acclimate

OSA Therapy Options

Hypoglossal Nerve Stimulation



? Sleep Apnea in Patients Post Advanced HF therapies

- Many Advanced HF patients are never been screened, let alone tested prior to being referred for advanced therapies
- For patients with a history of SBD there is a presumed resolution or marked improvements post left ventricular assist device or transplantation that will not require continuing sleep therapies
- Significant risks for worsening of sleep apnea resulting in limited response to advanced HF therapies
- **EXTREME PAUSITY OF DATA IN THIS PATIENT POPULATION**

?OSA In Cardiac Transplant

Untreated OSA had 3x risk of Late Graft Dysfunction

The Effect of Obstructive Sleep Apnea on 3-Year Outcomes in Patients Who Underwent Orthotopic Heart Transplantation

Aasim Afzal, MD, MBA[a,b,*], Kristen M. Tecson, PhD[c], Aayla K. Jamil, MPH[b], Joost Felius, PhD[b], Puneet S. Garcha, MD[a], Shelley A. Hall, MD[a,b], and Sandra A. Carey, PhD[d]

Despite the well-known association between obstructive sleep apnea (OSA) and cardiovascular disease, there is a paucity of data regarding OSA in orthotopic heart transplant (OHT) recipients and its effect on clinical outcomes. Hence, we sought to determine the association between OSA, as detected by polysomnography, and late graft dysfunction (LGD) after OHT. In this retrospective review of consecutive OHT recipients from 2012 to 2014 at our center, we examined LGD, i.e., graft failure >1 year after OHT, through competing risks analysis. Due to small sample size and event counts, as well as preliminary testing which revealed statistically similar demographics and outcomes, we pooled patients who had treated OSA with those who had no OSA. Of 146 patients, 29 (20%) had untreated OSA, i.e., OSA without use of continuous positive airway pressure therapy, at the time of transplantation. Patients with untreated OSA were significantly older, heavier, and more likely to have baseline hypertension than those with treated/no OSA. Although there were no differences between groups in regard to short-term complications of acute kidney injury, cardiac allograft vasculopathy, or primary graft dysfunction, there were significant differences in the occurrence of LGD. Those with untreated OSA were at 3 times the risk of developing LGD than those with treated/no OSA (hazard ratio 3.2; 95% confidence interval 1.3 to 7.9; p = 0.01). Because OSA is a common co-morbidity of OHT patients and because patients with untreated OSA have an elevated risk of LGD, screening for and treating OSA should occur during the OHT selection period. **(Am J Cardiol 2019;124:51–54)**

Thank You!

"I'm the Apnea Fairy. I have orders to give you a wake up call at 10:30, 10:47, 10:53, 11:02, 11:17, 11:26..."