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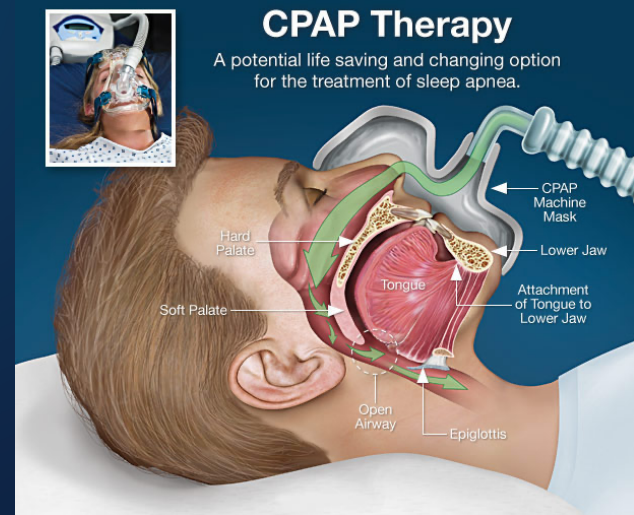
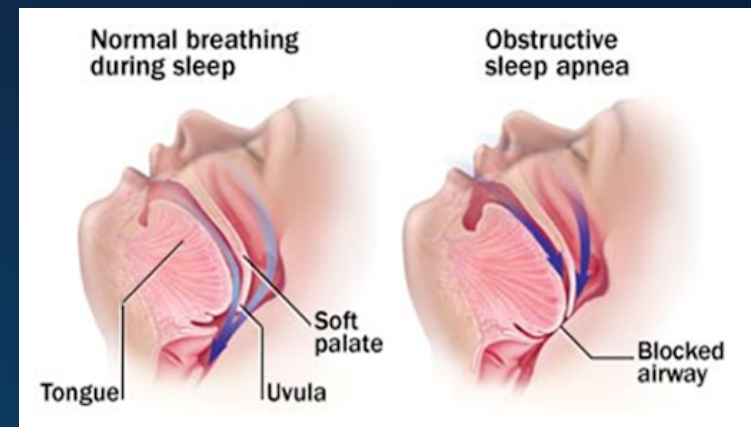
**Sidney Kimmel
Medical College™**
at Thomas Jefferson University

Effects of Continuous Positive Airway Pressure on Cardiovascular Risk in Obstructive Sleep Apnea

Natalia Salinas, Amy He**, Dani Yellanki**, Peter Zhang**, Grace Severance**, Zach Mace**, Olivia Taylor**, Cynthia Cheng MD-PhD*

Introduction

- Obstructive Sleep Apnea (OSA)
- CPAP therapy is the gold standard
- OSA significantly promotes cardiovascular risk¹
- Studies have shown associations between long term variability of blood pressure and heart rate with cardiovascular outcomes²



- CPAP therapy shown to improve predictors of cardiovascular events: blood pressure, resting heart rate, sympathetic activation, blood vessel stiffness, and mood
- Previous studies showed mixed results of long-term therapy on incidence of cardiovascular events³
 - Low CPAP adherence (< 4 hrs/night) may not have been representative of therapy
 - In another study among compliant patients, CPAP reduced the risk of adverse CV events by 30%⁴
- Our project:
 - Largest proposed retrospective study (n = 5000)
 - Looks at the effect of CPAP usage hours on CVD outcomes
 - Better compliance rates at Jefferson (50-60%) vs nationwide (30-50%)

Objectives & Hypothesis

- Research Question
 - How does continuous airway pressure (CPAP) therapy affect cardiovascular risk factors in patients with moderate to severe obstructive sleep apnea (OSA)?
 - How does the incidence of cardiovascular events in patients with OSA differ between patients who are compliant and noncompliant with CPAP therapy?
- Hypothesis
 - The incidence of cardiovascular events is decreased in a dose dependent fashion in patients with moderate to severe OSA who comply with CPAP therapy.

Approach & Methods

- Study design: Retrospective Medical Chart Review
- Study sample: N = 10 pilot study
 - Patients from Jefferson Sleep Center
 - With moderate to severe OSA
- Data source and collection
 - Full EPIC chart review for inclusion variables
 - From 6 months before PSG to now
 - CPAP adherence assessed as both categorical variable and continuous variable

Approach & Methods

- Exclusion criteria
 - Pregnancy
 - Recreational drug use
 - Malignancy diagnosis
 - Mild OSA
 - Upper airway surgeries
 - Myopathies, GBS, ALS, MS
- Outcomes
 - Major adverse cardiovascular events
 - Cardiovascular risk factors
 - Blood pressure variability
 - Heart rate variability
- Analysis: t-tests

Variable	N	Mean ± SD	Range
age	10	65.80 ± 7.28	57-75
PreSlpBmiAvg	10	34.52 ± 7.62	24.21-47.65

Demographics			
	Control	Treatment	Total
Sample Size	3	7	10
Mean Age	67.7	65.9	65.8
Female	3	2	5
Male	0	5	5
African American	3	3	6
Caucasian	0	4	4

slpsbpvar	10	14.36 ± 8.86	2.12-27.58
slpdbpvar	10	4.60 ± 3.38	0.71-12.73
slphrvar	10	4.67 ± 3.04	0.71-10.58
HRCHANGE	8	1.00 ± 5.91	-5.50-12.00
PreBlgAve	5	130.60 ± 31.79	99.00-172.00
PostBlgAveB	4	124.25 ± 34.12	91.00-172.00
BLGCHANGE	4	12.00 ± 36.23	-17.00-65.00

Systolic BP change

	N	Pre Average	Post Average	Mean	Std Dev	Std Err
CPAP	5	132.04	137.00	-4.85	16.10	7.20
Control	3	122.50	121.33	1.17	38.78	22.39

	Variances	t value	p value
Pooled t-test	Equal	-0.32	0.76

Diastolic BP change

	N	Pre Average	Post Average	Mean	Std Dev	Std Err
CPAP	5	76.42	81.80	-4.50	5.00	2.24
Control	3	73.00	68.00	5.00	13.53	7.81

	Variances	t value	p value
Pooled t-test	Equal	-1.48	0.19

HR change

	N	Pre Average	Post Average	Mean	Std Dev	Std Err
CPAP	5	75.50	74.20	1.3	7.55	3.37
Control	3	83.00	82.50	0.50	2.78	1.61

	Variiances	t value	p value
Pooled t-test	Equal	0.17	0.87

Conclusions

- Data on cardiovascular events not sufficient
- Control subjects had SBP drop of 1 mmHg vs CPAP subjects who increased by 5 mmHg; DBP drop of 5 mmHg vs control subjects who increased by 5 mmHg, but not significant: likely due to BP meds, sample size
 - $p = 0.2$
- A larger, controlled sample size is necessary to truly test our hypothesis: Data collection ongoing
- These findings can be used to inform physicians about the importance of CPAP therapy in managing both OSA and long-term cardiovascular health and complications

Future Directions

- Complete comprehensive chart review for remaining patients such that $n = 5000$
- Need to better elucidate the potential significance of CPAP therapy on BP and HR variability

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