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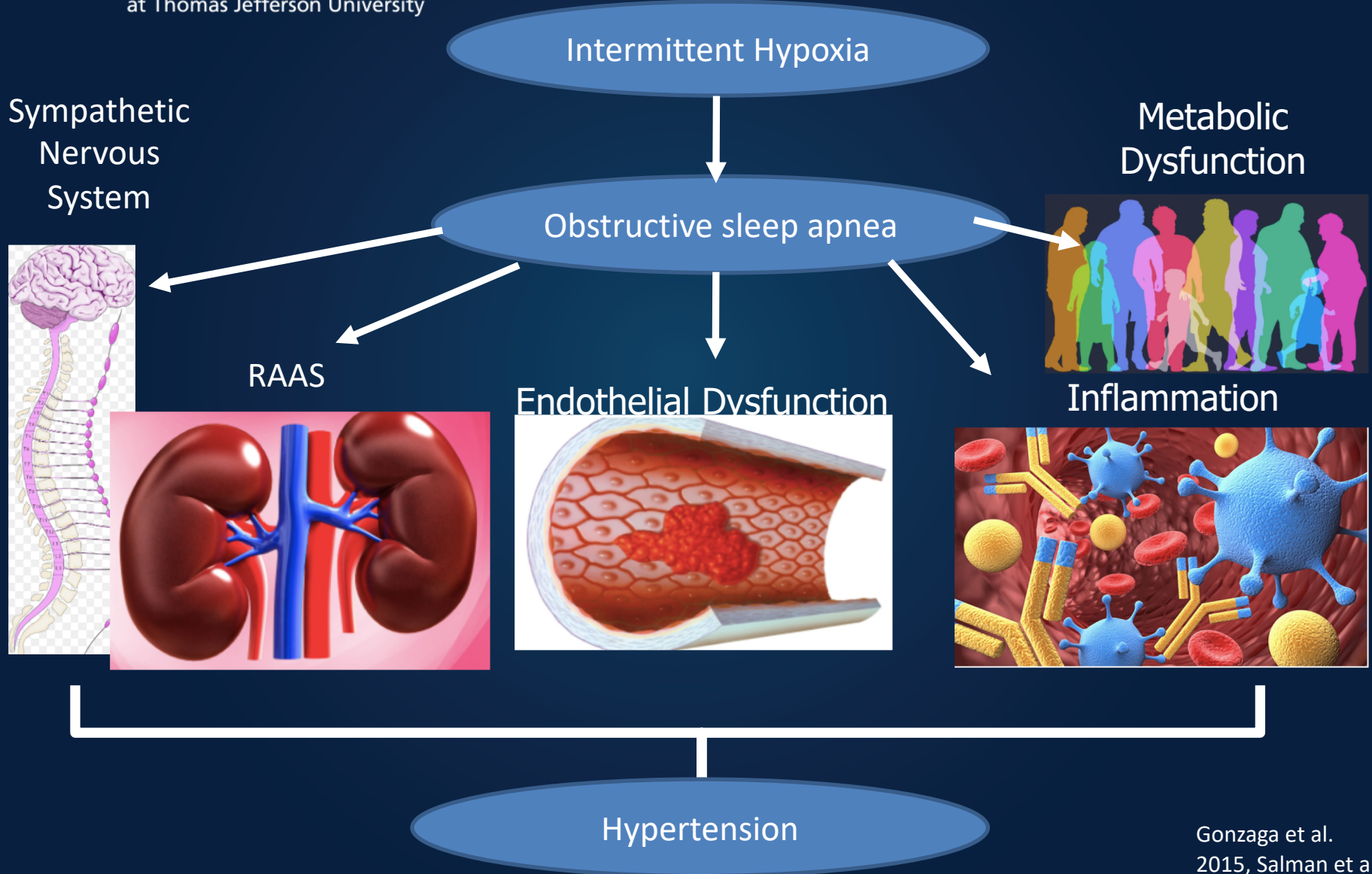
**Sidney Kimmel
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Effects of continuous positive airway pressure on cardiovascular risk in obstructive sleep apnea

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

Introduction

Association between OSA and HTN





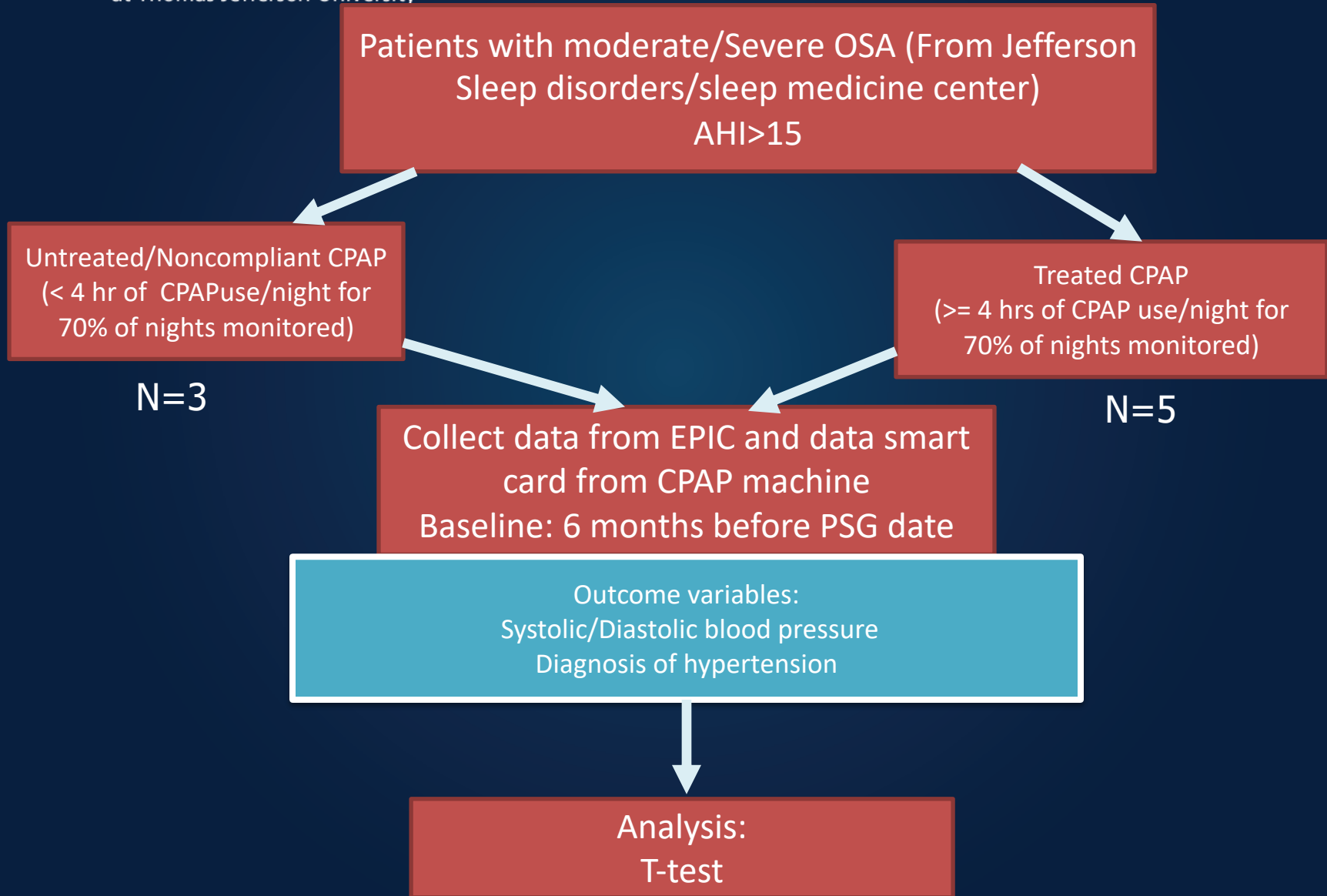
Rationale:

- Current literature: variability in blood pressure outcomes following the treatment of CPAP in OSA patients:
- Lit review (22 studies):
 - 17 studies showed improvement (4 in systolic pressure only, 2 in diastolic pressure only, 11 in both systolic and diastolic pressure)
 - 5 studies showed no significant improvement
 - Possible Reasons: Small sample size and limited power, unbalanced male to female ratio, categorical definition CPAP adherence (4 hours/night), low CPAP adherence (<4 hours per night)

Objectives

- Research Question:
 - What is the observed difference in BP before and after starting CPAP in OSA patients who are compliant and noncompliant with CPAP?
- Hypothesis:
 - In patients with moderate-severe OSA (AHI \geq 15):
 - 1) Compliance with CPAP therapy (>4hrs of usage/night for 70% of the nights of the entire study period) leads to a decrease in average annual systolic and diastolic blood pressure (SBP and DBP) measurements, compared to noncompliant/non CPAP users.
 - 2) A greater average number of hours of CPAP usage per night and a greater percentage of CPAP usage throughout the entire study period leads to a greater decrease in average annual (SBP and DBP)

Approach & Results



Pilot Study:

Systolic BP Change

SBP	n	Pre Average	Post Average	Mean SBP Change
CPAP	5	132.04	137.00	+ 4.85
Control	3	122.50	121.33	- 1.17

Pilot Study:

Diastolic BP Change

DBP	n	Pre Average	Post Average	Mean DBP Change
CPAP	5	76.42	81.80	+4.50
Control	3	73.00	68.00	-5.00

Approach & Results

- Findings:
 - CPAP nonusers experienced a decrease of SBP by 5 mm compared to CPAP patients who had an increase of 1 mm Hg from baseline ($p=0.76$)
 - CPAP nonusers had DBP drop of 5 mm compared to CPAP patients who increased by 5 mm Hg ($p=0.19$)
 - Paradoxical BP increase with CPAP compared to controls. Likely due to uncontrolled analysis with very small sample size, very large standard deviation. Could be due to medication use or other confounding factors

Conclusions

- Unexpected preliminary findings:
- Very small pilot. A larger, controlled sample size is required to assess the significance of this finding (underway)
- We hypothesize that findings will support current literature that CPAP therapy has beneficial effects in reducing blood pressure
- Expected implications: CPAP has the therapeutic potential to improve cardiovascular prognosis in patients with OSA

Future Directions

- Increase power of study
 - Large scale 2000+ patient study with longer study period
- Investigate potential predictive value of lower CPAP use and risk of new hypertension diagnosis

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