**Recognition and Treatment of Sleep-Disordered Breathing in Obese African American
Hospitalized Patients may improve outcome.**

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Running Head: Recognition and Treatment of Sleep Disordered Breathing in African Americans

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ABSTRACT

PURPOSE:

The HoSMed Database recently demonstrated a high prevalence of obstructive sleep apnea (OSA) in hospitalized obese patients. Based on a long-term follow-up, this study showed an improved survival among patients who were adherent with the therapy. In this post-hoc analysis we explore the characteristics, associations, and mortality outcome of OSA in the African American (AA) population.

METHODS:

These subset analyses included obese AA patients screened in the hospital as high-risk for OSA. Stepwise logistic regression analysis was used to identify predictors of OSA. Patients who had polysomnography (PSG) and were initiated on positive airway pressure (PAP) therapy were followed and dichotomized to adherent versus non-adherent groups based on compliance data. Mortality rates in both groups were compared.

RESULTS:

Of the total of 2022 AA patients screened, 1370 (60.7% females) were identified as high risk for OSA. Of these, 279 had PSG diagnosed OSA (mean AHI = 36 /hour) and were initiated on PAP therapy. Adherence in AAs was significantly lower than for Caucasians (21% versus 45%, Chi-square $p < 0.0001$). The following statistically significant predictors of OSA were found: heart failure, chronic kidney disease, hypertension and asthma/COPD, BMI and age. A Log-rank

survival analysis of AAs on CPAP showed non-significant benefit of adherence (HR: 0.22; 95% CI 0.03 – 1.7, $p=0.11$); a propensity analysis of AAs and Caucasians that adjusted for race and potential confounding variables found a statistically significant benefit of adherence (HR: 0.29; 0.13-0.64; $p=0.002$).

CONCLUSION:

This large database of hospitalized patients confirms a high prevalence and lower adherence to PAP therapy in African Americans. Adherent patients, however, showed mortality benefit similar to Caucasians.

Current Knowledge/Study Rationale: There is paucity of data on sleep disordered breathing in African Americans patients. This study analyzed a large cohort of obese hospitalized African Americans and explored their characteristics, associations and outcomes vis-a-vis Caucasians.

Study Impact: The study provides insight into the differences in clinical characteristics and clinical outcomes between hospitalized African American and Caucasians patient with sleep disordered breathing. These findings can assist in the development of strategies to address health disparities.

INTRODUCTION

Sleep-disordered breathing (SDB) is a common and underdiagnosed disorder,¹ which is associated with significant cardiovascular implications.² Prior studies suggest that SDB may be more prevalent and severe in patients of African American ethnicity.^{3,4} African Americans (AA) also tend to be more obese, have higher rates of hypertension and significantly greater oxygen desaturation during SDB events on polysomnography (PSG);⁵ they have been shown to be less

adherent to continuous positive airway pressure (CPAP) therapy for SDB.⁶ Factors responsible for this disparity in CPAP compliance are unclear, but may partially be explained by lower socioeconomic status⁷ and shorter sleep durations.⁸ The impact of this sub-optimal CPAP adherence on health outcomes in African Americans is not well understood.

Analysis of the HoSMed database recently demonstrated a high prevalence of SDB in hospitalized obese patients. Based on long-term follow-up, this study showed an improved survival among patients who were adherent with CPAP therapy after discharge.^{9,10} In this post-hoc analysis of the HoSMed database, we explore the characteristics, associations and mortality related to SDB in AA in comparison to their Caucasian counterparts. We hypothesize that these factors will be different for AA.

METHODOLOGY

This study is a post-hoc analysis of the HosMed Database, a large registry of obese hospitalized patients at high risk for SDB. The methods of enrollment in the registry have been extensively described.⁹ Briefly, the registry included patients admitted to a large teaching hospital between 2013-2016, with a body mass index (BMI) of ≥ 30 kg/m² and who screened positive for SDB with the STOP or STOP-BANG questionnaires. Patients were seen by the sleep consult service, who recommended inpatient high-resolution pulse oximetry (HRPO) and subsequent outpatient PSG after discharge to confirm the diagnosis of SDB. A total of 2022 consecutive African-American patients admitted to the hospital were screened for SDB and 1370 were found to be high risk. The prevalence of SDB was conservatively estimated as the number of patients with PSG diagnosed SDB divided by the number of patients in the hospital cohort.

Patients who had a PSG-confirmed diagnosis of obstructive sleep apnea were started on positive airway pressure (PAP) therapy (primarily CPAP). Patient adherence with PAP was monitored for the first 3 months. Adherence was defined as usage of device for 4 or more hours on 70 % or more of nights. Longitudinal follow up continued for as long as 1340 days with a mean of 610 days to determine vital status. (For complete methodology refer to HoSMed Study^{9,10})

STATISTICAL ANALYSIS

Demographic variables and PSG results of AA and Caucasians with SDB were compared with Fisher's exact tests and t-tests, as appropriate. Demographic variables and disease history of AA that had HRPO testing only also were compared to those with HRPO and PSG testing with Fisher's exact tests and t-tests, as appropriate. Stepwise logistic regression analysis was used to identify predictors of SDB ($AHI \geq 5$) for AA and Caucasians separately. $P < 0.15$ on univariate analysis was required to enter the model, and $P < 0.05$ to remain in it. A subsequent logistic regression analysis of SDB was performed for AA and Caucasian patients combined, using race and all variables significant in the by-race analyses, and the interactions of these variables with race. Patients who had PSG and were initiated on PAP therapy were followed and dichotomized to adherent versus non-adherent groups based on compliance data. The demographics of adherent and non-adherent AA patients with SDB were compared with Fisher's exact tests and t-tests, as appropriate. A logistic regression model with adherence as the dependent variable was constructed in the same manner as for SDB. Mortality rates in adherent and non-adherent groups were compared with a Log-Rank test, as well as an inverse propensity-score weighted Cox regression analysis with race as an additional factor.

The effects of confounding variables in the comparison of mortality rates were mitigated using an inverse propensity-score weighted Cox regression analysis. In this analysis, the probability of AAs and Caucasians on PAP therapy being compliant given their race and demographic and disease history was modelled with a logistic regression. Patients were then weighted in the Cox regression by the inverse of their estimated probability of being compliant (for the compliant group) or the probability of being non-compliant (for the non-compliant group). This methodology has been shown to mitigate the potential bias effects of confounding variables.²⁶

RESULTS

As shown in Figure 1, of 5062 patients screened, 2022 were AA and 2674 were Caucasians with the remainder other races/ethnicities or unknown. Ultimately, after undergoing HRPO, 279 AA and 274 Caucasians screened positive in the hospital for SDB and were found to have SDB on subsequent PSG. Significantly more STOP positive AAs ($330/1411=23.3\%$) underwent PSG than Caucasians ($305/1698=15.5\%$, $p=0.0002$).

Demographic, anthropometric and clinical characteristics of AA and Caucasians with SDB are compared in Table 1. Notably, AAs with SDB were more likely to be female (59.1% vs 32.8%, $p<0.0001$), younger (58.9 vs. 62.1 years, $p=0.002$) and heavier (body mass index [BMI]: 38.3 vs. 35.8 kg/m², $p=0.002$). They also had a smaller neck circumference (15.8 vs. 16.9 inches, $p=0.006$), were more likely to have diabetes (47.3% vs. 37.6%, $p=0.03$), chronic renal failure (30.5% vs. 21.2%, $p=0.02$) and to be on a calcium channel blocker (36.9% vs. 21.5%, $p<0.0001$), but less likely to have atrial fibrillation (13.6% vs. 20.7%, $p=0.03$). The estimated prevalence of SDB in AA was significantly higher in AAs (13.8%) than in Caucasians (10.2%), ($p=0.0002$).

Clinical characteristics of AA patients who underwent HRPO only in comparison to having had HRPO and PSG are shown in Table 2. Over a diverse number of clinical parameters, there were no significant differences between the two groups.

In Table 3 are shown comparisons of PSG derived AHI and HRPO oximetry data between AA and Caucasians. There were no significant differences in SDB severity between the two groups with respect to the mean AHI, oxygen desaturation index (ODI) and the time that oxygen was less than 88%.

As shown in Table 4, using stepwise logistic regression, the following statistically significant predictors of SDB (AHI ≥ 5) in AAs were found: heart failure (OR: 1.8; 95% CI: 1.3 – 2.4), chronic kidney disease (OR: 1.8; 95% CI: 1.3 – 2.4); hypertension (OR: 1.7; 95% CI: 1.2 – 2.3), and asthma/COPD (OR: 1.6; 95% CI: 1.2 – 2.1). The age groups of 50-60 and 60-70 years had significantly higher SDB rates than the reference age group of <50 years. AAs with a BMI of ≥ 40 kg/m² had a significantly higher SDB rate than the reference BMI group of <35 kg/m². These same variables were also significant predictors of SDB in Caucasians with the exception of heart failure (not significant for Caucasians) and gender (significant protective effect for female Caucasians). All significant predictors and their interactions with race (and a race main effect) were included in a combined-race logistic regression (Table 4). The effects of BMI, heart failure, chronic renal failure, hypertension, and asthma/COPD were similar for the two races (interaction p -values > 0.05); but the effects of age and sex differed for the two races ($p=0.01$ for each). Older AAs (50-70 years old) were more likely to have SDB than the reference group

of <50 years. However, this effect was not observed in Caucasians and the oldest Caucasian group (>70 years old) was less likely to have SDB than the reference group. Caucasian females were less likely than males to have SDB; for AAs there was no difference between the sexes.

Adherence in AAs was significantly lower (44/206) than for Caucasians 97/217 (21% versus 45%, Chi-square $p<0.0001$). As shown in Table 5, in a multivariate stepwise logistic regression, female gender, atrial fibrillation and possibly hypertension were predictors of improved adherence in AAs. In contrast, the absence of asthma/COPD was a significant predictor of adherence in Caucasians. In a race-combined logistic model, the effects of gender, atrial fibrillation, hypertension, and asthma/COPD were similar in the two races (Table 5, interaction p -values >0.05). After adjustment for co-morbidities in the logistic regression model, race was still a significant predictor of adherence ($p=0.0002$), with female Caucasian adherence rates 2.8 times as high as female AAs and male Caucasian adherence rates 5.8 times as high as male AAs.

For AA patients who were adherent to PAP within the first 3 months, a trend towards improved survival after a mean follow-up period of 609 days was observed (HR: 0.22; 0.03 – 1.7; Log-rank p -value=0.11), (Figure 2). As shown in Figure 3, this was qualitatively similar to the benefit of adherence in the Caucasian group (HR: 0.41; 0.16 – 1.0; $p=0.05$).

In the inverse propensity-score weighted Cox regression analysis of AAs and Caucasians with race and adherence as predictors, the effects of adherence on survival were similar for the two races (interaction p -value =0.62) with a significant protective effect (HR: 0.29; 0.13-0.64; $p=0.002$). Within the compliant group (or the non-compliant group), race was not a statistically significant predictor of survival (p -value=0.12), although AAs had somewhat shorter survival times.

DISCUSSION

This post-hoc subgroup analysis is the largest study comparing obese hospitalized AA and Caucasian patients screened for SDB and followed long term. In this cohort, we found that despite higher prevalence of SDB and significantly lower adherence rates, AA patients who were adherent to therapy had a mortality benefit similar to Caucasians. In the combined cohort

(AA and Caucasians) of patients who were adherent to the PAP therapy race did not impact survival. In addition, important demographic, anthropometric and co-morbidity differences between these two races were noted. Although hospitalized AAs had a higher prevalence of SDB, the severity of SDB was similar. Hospital screening and education on sleep disordered breathing appeared to have a positive impact with significantly higher percentages of AA patients appearing for a follow-up diagnostic PSG. Despite a higher rate of PSG (percentage of patient undergoing diagnostic testing post discharge), the adherence to PAP therapy was worse among AAs compared to Caucasians.

This study showed that hospitalized AA patients have higher prevalence of SDB (13.8% versus 10.2%) compared to their Caucasian counterparts. This observation may be partially explained by the higher percentage of AA that underwent PSG, as compared to Caucasians. Nevertheless, our findings are consistent with past studies.^{5,11,12} Although in contrast to others, we did not note any difference in the severity of the disease between the AA patients compared to Caucasians patients despite a greater degree of obesity in the AA cohort. This latter finding is at variance with a large meta-analysis of 8 studies in which SDB was more severe in AA. However, there was significant heterogeneity among the studies that were included.¹³ A more recent study found that young and middle-aged AA men had more severe SDB than their Caucasian counterparts.¹⁴ Considered together, our data indicate that differences in the prevalence and severity SDB between AA and Caucasians are different in those that are hospitalized.

We noted that AA SDB patients showed a significantly higher prevalence of co-morbid conditions (diabetes, hypertension, chronic renal failure), were more obese and younger compared to Caucasian patients. Other studies in non-hospitalized populations have also found disparities in co-morbid medical conditions between AA and Caucasians.^{15,16} To a large extent, this is a reflection of a higher prevalence of obesity, hypertension, diabetes and chronic renal disease in AA. We know of only one study documenting the prevalence of chronic medical conditions between AA and Caucasians with SDB. In that study, hypertension was associated with probable SDB only in AA, but in both racial groups if participants were overweight.¹⁷ In addition, our data is consistent with epidemiologic findings suggesting that young AA are more

likely to have SDB in comparison to Caucasians.^{18,19} In contrast, consistent with prior data, Caucasians were found to have more coronary artery disease and atrial fibrillation.^{20,21,22}

Several studies including the current analysis have observed that adherence with PAP is lower among AA patients.^{6,23} Lower socioeconomic status and its association with poorer understanding of the risks and consequences of SDB is an important explanation.^{7,24} However, cultural differences as well as shorter sleep durations and more insomnia symptoms among AA are likely contributing factors.²⁴

PAP adherent patients had statistically significant improved survival compared to those who were non-adherent, for both AAs and Caucasians in a propensity-score analysis. This finding was qualitatively similar to the better long-term survival among PAP adherent Caucasian patients. This suggests that despite a higher prevalence and greater likelihood of co-morbid conditions, improvement in mortality occurs among hospitalized obese AA patients with SDB if they are adherent with PAP therapy, and that it is similar to Caucasians. This finding is unique in as much as the few datasets available examining race-stratified survival rates among persons with SDB have shown no disparity between AA and Caucasians, but have not controlled for SDB treatment.^{14,25}

Our study has several limitations. First, it is a post hoc sub-group analysis which may be subject to inflated false positive rates arising from multiple testing. Second, these findings are also limited to obese AA patients admitted to the hospital medical services screened in the hospitalized settings. These findings may not apply to non-obese patients and in ambulatory settings. Third, not all patients screened as high risk underwent PSG which may lead to selection bias. We think that such bias is minimal as all demographic, clinical and PSG variables were similar in a comparison of AA patients that underwent PSG testing and those who did not (Table 2). This comparison was done for Caucasian patients in the HoSMed study, which also found that these groups were similar.⁹ Fourth, the SDB prevalence rates that we calculated for AA and Caucasians were conservative and based on the following assumptions: SDB was present only in those who had a PSG; there were no false positive or negative tests; the non-PSG group did not have any patients who had SDB. Although actual prevalence rates may be

higher, again we believe that any differential bias between the races was not significant as the baseline characteristics of the patients who were high risk and did not undergo PSG were similar to those who underwent PSG. In addition, the HRPO testing in the hospital in these high-risk patients was consistent with sleep disordered breathing.

Despite the stated limitations, our study has an important strength. To our knowledge, this is the largest database of AA patients evaluated for SDB in hospitalized patients to date. As such, it provides insight into the extent of undiagnosed and untreated sleep-disordered breathing in hospitalized AA patients and their outcomes.

In conclusion, this sub group analysis of obese hospitalized patients demonstrates that AA patients have a higher prevalence of SDB, poorer adherence but those who adhere have mortality benefit similar to that of Caucasians. While the adherence in this population with PAP therapy is significantly lower than in Caucasians patients, it is encouraging that the patients who are adherent appear to have a survival benefit similar to Caucasians. Since pro-active screening and education during hospitalization resulted in improved diagnostic testing in African-American population, a similar focus on adherence may reduce health disparity in this population.

ABBREVIATIONS

- **OSA:** Obstructive sleep apnea
- **AA:** African American
- **PSG:** Polysomnography
- **PAP:** Positive airway pressure
- **AHI:** Apnea-Hypopnea Index
- **COPD:** Chronic Obstructive Pulmonary Disease
- **SBD:** Sleep-disordered breathing
- **CPAP:** Continuous positive airway pressure
- **HRPO:** High-resolution pulse oximetry
- **ODI:** Oxygen desaturation index

REFERENCES

1. Peppard PE, Young T, Barnet JH, et al. Increased prevalence of sleep-disordered breathing in adults. *Am J Epidemiol* 2013;177(9):1006-1014.
2. Floras JS. Sleep apnea and cardiovascular risk. *J Cardiol* 2014;63(1):3-8.
3. van Ryn, M, Burke, J. The effect of patient race and socio-economic status on physicians' perceptions of patients. *Soc Sci Med* 2000;50(6):813-28.
4. Williams NJ, Grandne MA, Snipes A, et al. Racial/ethnic disparities in sleep health and health care: importance of the sociocultural context. *Sleep Health* 2015;1(1):28-35.
5. Meetze K, Gillespie MB, Lee FS. Obstructive sleep apnea: a comparison of black and white subjects. *Laryngoscope* 2002;112(7 Pt 1):1271-4.
6. Schwartz SW, Sebastião Y, Rosas J, et al. Racial disparity in adherence to positive airway pressure among US veterans. *Sleep Breath* 2016;20(3):947-55.
7. Billings ME, Auckley D, Benca R, et al. Race and residential socioeconomic status as predictors of CPAP adherence. *Sleep* 2011;34(12):1653-8.
8. Billings ME, Rosen CL, Wang R, et al. Is the relationship between race and continuous positive airway pressure adherence mediated by sleep duration? *Sleep* 2013;36(2):221-7.
9. Sharma S, Mukhtar U, Kelly C, et al. Recognition and Treatment of Sleep-Disordered Breathing in Obese Hospitalized Patients May Improve Survival. The HoSmed Database. *Am J Med* 2017;130(10):1184-1191.
10. Sharma S, Mather PJ, Efird JT, et al. Obstructive sleep apnea in obese hospitalized patients: A single center experience. *J Clin Sleep Med* 2015;11(7):717-723.
11. Chen X, Wang R, Zee P, et al. Racial/Ethnic Differences in Sleep Disturbances: The Multi-Ethnic Study of Atherosclerosis (MESA). *Sleep* 2015;38(6):877-88.
12. Ancoli-Israel S, Klauber MR, Stepnowsky C, et al. Sleep-disordered breathing in African-American elderly. *Am J Respir Crit Care Med* 1995;152(6 Pt 1):1946-9.
13. Ruiter ME, DeCoster J, Jacobs L, et al. Sleep disorders in African Americans and Caucasian Americans: a meta-analysis. *Behav Sleep Med* 2010;8(4):246-59.
14. Pranathigeswaran S, Badr MS, Severson R, et al. The influence of race on the severity of sleep disordered breathing. *J Clin Sleep Med* 2013;15(9):303-9.
15. Liao Y, Bang D, Cosgrove S, et al. Surveillance of health status in minority communities - Racial and Ethnic Approaches to Community Health Across the U.S. (REACH U.S.) Risk Factor Survey, United States, 2009. *MMWR Surveill Summ* 2011;60(6):1-44.
16. Ahluwalia IB, Mack KA, Murphy W, et al. State-specific prevalence of selected chronic disease-related characteristics--Behavioral Risk Factor Surveillance System, 2001. *MMWR Surveill Summ* 2003;52(8):1-80.
17. Sands-Lincoln M, Grandner M, Whinnery J, et al. The association between obstructive sleep apnea and hypertension by race/ethnicity in a nationally representative sample. *J Clin Hypertens (Greenwich)* 2013;15(8):593-9.

18. Redline S, Tishler PV, Hans MG, et al. Racial differences in sleep-disordered breathing in African-Americans and Caucasians. *Am J Respir Crit Care Med* 1997;155(1):186-92.
19. Shen AY, Contreras R, Sobnosky S, et al. Racial/ethnic differences in the prevalence of atrial fibrillation among older adults--a cross-sectional study. *J Natl Med Assoc* 2010;102(10):906-13.
20. Mozaffarian D, Benjamin EJ, Go AS, et al. Heart disease and stroke statistics—2015 update: a report from the American Heart Association. *Circulation* 2015;131(4):e29-322.
21. Go A.S., Hylek E.M., Phillips K.A., et al. Prevalence of diagnosed atrial fibrillation in adults: national implications for rhythm management and stroke prevention: The AnTicoagulation and Risk Factors in Atrial Fibrillation (ATRIA) Study. *JAMA* 2001;285(18):2370-5.
22. Afzal A., Ananthasubramaniam K., Sharma N., et al. Racial differences in patients with heart failure. *Clin Cardiol* 1999;22(12):791-4.
23. Wallace DM, Wohlgemuth WK. Does race-ethnicity moderate the relationship between CPAP adherence and functional outcomes of sleep in US veterans with obstructive sleep apnea syndrome? *J Clin Sleep Med* 2014;10(10):1083-91.
24. Dudley KA, Patel SR. Disparities and genetic risk factors in obstructive sleep apnea. *Sleep Med* 2016;18:96-102.
25. Yeboah J, Redline S, Johnson C, et al. Association between sleep apnea, snoring, incident cardiovascular events and all-cause mortality in an adult population: MESA. *Atherosclerosis* 2011;219(2):963-8.
26. Rosenbaum PR, Rubin DB. The central role of the propensity score in observational studies for causal effects. *Biometrika* 1983; 70:41-55.

Table 1: Comparison of Demographic, Anthropometric and Clinical Characteristics of Caucasian and African- American patients with PSG Confirmed Sleep Disordered Breathing

Parameter	Caucasian Patients (N=274)	African American Patients (N=279)	p-value
Gender - n(%)			
Male	184 (67.2%)	114 (40.9%)	<0.0001
Female	90 (32.8%)	165 (59.1%)	
Age (yr)			
N	274	279	0.002
Mean (SD)	62.1 (12.5)	58.9 (11.7)	
Median	62	59	
Min, Max	19.0, 92.0	21.0, 91.0	
BMI (kg/m2)			
N	274	279	0.002
Mean (SD)	35.8 (9.0)	38.3 (9.4)	
Median	34	36	
Min, Max	16.1, 70.9	20.0, 73.2	
Neck Circumference (cm)			
N	50	43	0.006
Mean (SD)	16.9 (1.8)	15.8 (1.8)	
Median	17	16	
Min, Max	13.0, 21.0	12.5, 19.0	

Parameter	Caucasian Patients (N=274)	African American Patients (N=279)	p-value
Comorbidities			
Heart Failure	57 (20.8%)	69 (24.7%)	0.31
Asthma/COPD	64 (23.4%)	82 (29.4%)	0.12
Coronary Artery Disease	114 (41.6%)	97 (34.8%)	0.12
Diabetes	103 (37.6%)	132 (47.3%)	0.03
Hypertension	200 (73.0%)	223 (79.9%)	0.06
Chronic Renal Failure	58 (21.2%)	85 (30.5%)	0.02
A-Fib	56 (20.7%)	38 (13.6%)	0.03
Concomitant Medications			
ACE, ARB, Isosorbide, Hydralazine	140 (51.1%)	135 (48.4%)	0.55
Beta Blockers	134 (48.9%)	143 (51.3%)	0.61
Calcium Channel Blocker	59 (21.5%)	103 (36.9%)	<0.0001
Diuretics	150 (54.7%)	160 (57.3%)	0.55
SDB n(%)*	274 (10.2%)	279 (13.8%)	0.0002

*Total number of Caucasians and African-Americans screened was 2674 and 2022.

Table 2: Comparison of baseline characteristics of African American patients undergoing high resolution pulse oximetry (HRPO) only and those who had both HRPO and polysomnography (PSG)

<i>Characteristic</i>	<i>HRPO only (N=382)</i>	<i>Both PSG & HRPO (N=192)</i>	<i>P-value</i>
Age (y), Mean $\pm$ SD	57 $\pm$ 14	58 $\pm$ 12	0.91
Median (IQR)	58 (18)	59 (14)	
BMI, Mean $\pm$ SD	36 $\pm$ 10	38 $\pm$ 10	0.19
Median (IQR)	35 (10)	36 (13)	
ODI, Mean $\pm$ SD	19 $\pm$ 20	24 $\pm$ 24	0.01
Median (IQR)	11 (21)	16 (29)	
AHI, Mean $\pm$ SD	-	31 $\pm$ 33	-
Median (IQR)	-	17 (41)	
Male, n (%)	171 (45%)	75 (39%)	0.21
Black, n (%)	382 (100%)	192 (100%)	-
Coronary Artery Disease, n (%)	129 (34%)	67 (35%)	0.85
Heart Failure, n (%)	91 (24%)	56 (29%)	0.19
Chronic Renal Failure, n (%)	79 (21%)	53 (28%)	0.07
Asthma/COPD, n (%)	93 (24%)	57 (30%)	0.19
Diabetes, n (%)	170 (45%)	94 (49%)	0.33
Hypertension, n (%)	282 (74%)	155 (81%)	0.08
A-Fib, n (%)	56 (15%)	22 (11%)	0.30
Diuretics, n (%)	196 (51%)	111 (58%)	0.16
ACE, ARB, Isosorbide, Hydralazine, n (%)	181 (48%)	101 (53%)	0.25
Beta Blocker, n (%)	183 (48%)	91 (47%)	0.93
Calcium Channel Blocker, n (%)	121 (32%)	70 (36%)	0.26

P-values are from two-sample t-tests or Fisher's exact tests, as appropriate.

Table 3: Comparison of Polysomnography and Oximetry Results between Caucasian and African- American patients with Sleep Disordered Breathing*

Parameter	Caucasian Patients (N=274)	African American Patients (N=279)	p-value
AHI (events/hour)			
N	274	279	
Mean (SD)	31.9 (27.3)	36.0 (32.9)	0.12
Median	20	23	
Min, Max	5.0, 118.2	5.0, 145.0	
ODI (events/hour)			
N	180	162	
Mean (SD)	30.8 (24.2)	26.6 (24.9)	0.12
Median	24	21	
Min, Max	0.4, 115.0	0.0, 124.0	
Time Oxygen <88% (minutes)			
N	143	117	
Mean (SD)	23.3 (45.3)	19.0 (41.7)	0.43
Median	4	1	
Min, Max	0.0, 261.0	0.0, 284.0	

*The ODI and time < 88% is derived from high resolution pulse oximetry performed in the hospital while AHI is derived from polysomnography

Table 4: Predictors of SDB (AHI ≥ 5) in African Americans and Caucasians. Logistic regression analysis (final model using stepwise logistic regression).

<i>Predictor</i>	<i>African Americans</i>		<i>Caucasians</i>		<i>AA v. CC P-value</i>
	<i>Odds-Ratio</i>	<i>95% CI for Odds-Ratio</i>	<i>Odds-Ratio</i>	<i>95% CI for Odds-Ratio</i>	
Age 50-60 vs <50	1.4	0.9, 2.2	1.1	0.7, 1.8	0.002
60-70 vs <50	2.3	1.5, 3.6	0.8	0.5, 1.3	
>70 vs <50	1.1	0.7, 1.8	0.8	0.5, 1.2	
BMI 35-40 vs <35	1.8	1.2, 2.6	1.4	0.9, 2.0	0.41
>40 vs <35	2.7	1.9, 3.9	3.2	2.2, 4.5	
Sex (males vs females)	1.3	1.0, 1.8	2.1	1.6, 2.9	0.03
Heart Failure	1.8	1.3, 2.6	1.3	0.9, 1.8	0.16
Chronic Renal Failure	1.8	1.3, 2.5	1.8	1.2, 2.6	0.99
Hypertension	2.3	1.6, 3.3	2.5	1.8, 3.4	0.79
Asthma/COPD	1.8	1.3, 2.6	1.4	1.0, 2.0	0.28

Table 5: Predictors of Adherence in African Americans and Caucasians. Logistic regression analysis (final model using stepwise logistic regression).

<i>Predictor</i>	<i>African Americans</i>		<i>Caucasians</i>		<i>AA v. CC P-value</i>
	<i>Odds-Ratio</i>	<i>95% CI for Odds-Ratio</i>	<i>Odds-Ratio</i>	<i>95% CI for Odds-Ratio</i>	
Sex (Male vs Female)	3.4	1.5, 7.5	1.6	0.9, 3.0	0.16
Atrial Fibrillation	2.9	1.1, 7.4	1.2	0.6, 2.5	0.16
Asthma/COPD	0.6	0.2, 1.4	0.4	0.2, 0.9	0.64
Hypertension	2.7	0.9, 7.6	1.1	0.6, 2.0	0.15

Figure 1 - Flow chart showing patient recruitment during hospitalization based on race. HRPO = high-resolution plethysmography; PSG = polysomnogram; SDB = sleep-disordered breathing.

Figure 2. Survival probability in adherent and non-adherent Caucasian and AA patients. Propensity-score weighted Cox regression analysis.