

Introduction

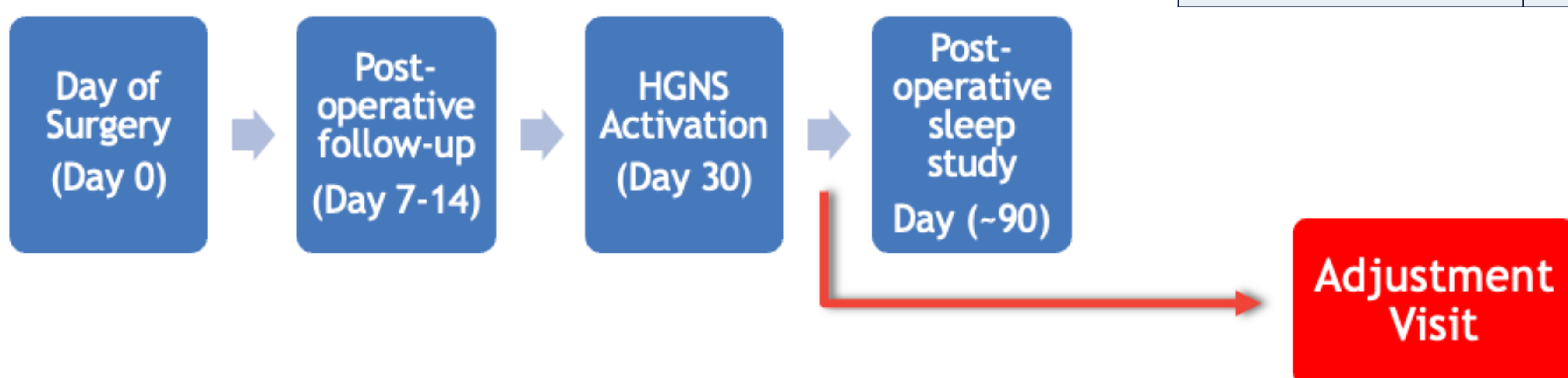
- Hypoglossal nerve stimulator (HGNS) therapy is a novel treatment for moderate-to-severe obstructive sleep apnea (OSA)
- Carefully selected adult patients show dramatic clinical/symptomatic improvements in both Apnea/Hypopnea Index (AHI) and quality of life
- At our institution, there is a large minority of patients (~25%) that present with initial intolerance to HGNS therapy, ultimately requiring in-office adjustment of the device
- There is a paucity of data on this cohort of 'intolerant' patients and how they respond to HGNS implantation long-term when compared to 'tolerant' patients
- Hypothesis:**
 - Early post-activation intolerance will be associated with higher post-operative AHI and lower O2 nadir
 - Increased sleep latency and presence of OP obstruction on DISE will be significant predictors of needing post-activation adjustment

Objectives

- To delve into the relationship between need for early post-activation adjustment and long-term surgical sleep outcomes
- To uncover significant predictors of the need for post-activation adjustment

Methods

- Single-institution, retrospective study
- All patients that underwent HGNS placement from 1/1/2020 – 12/31/2021 were reviewed
- Primary endpoints were post-operative AHI and post-operative O2 Nadir
- Secondary endpoints were to find predictors of post-activation intolerance:
 - Sleep latency, nightly wake-ups, insomnia severity index (ISI), total VOTE score, presence of OP obstruction on DISE
- Post-activation intolerance was defined as any patient needing an "adjustment visit"
- "Adjustment visits" were defined as any visit that occurred after initial activation of the device, before post-operative sleep study that included modification of the device settings



Results

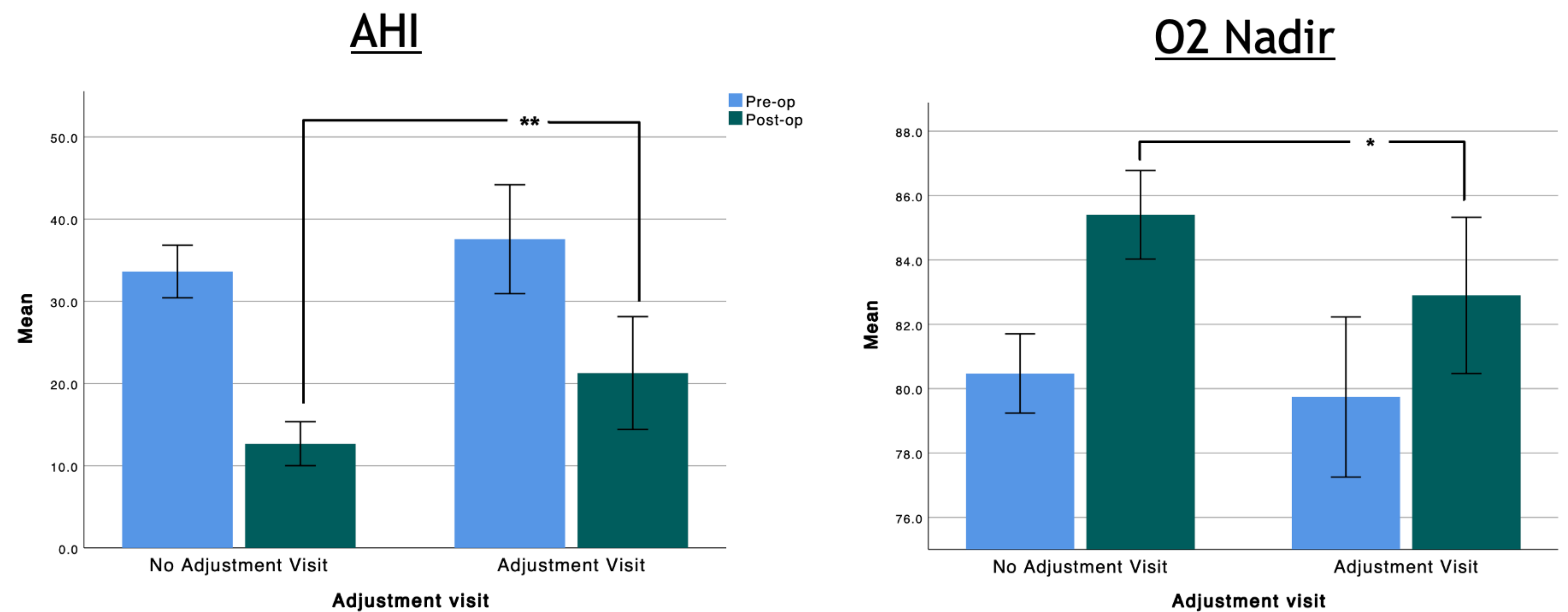


Figure 1: Comparison of patients with post-activation intolerance requiring adjustment vs patients not requiring post-activation adjustment. Left-hand graph showing statistically significant increase in post-operative AHI when comparing the two groups [12.5 vs 21.3; $p=0.002$]. Right-hand graph showing statistically significant increase in post-operative O2 Nadir when comparing the two groups [85.6 vs 82.2; $p=0.009$]. P values were calculated using Independent T-Tests to compare averages between groups.

Table 1: Study Sample Demographics

Demographics	Total	Adjustment	No Adjustment	P-value
n=	116	30 (26%)	86 (74%)	
Age	64.5	61.7 [11.4]	65.5 [11.8]	.062
Sex	Male	22 (73%)	54 (61%)	.248
	Female	8 (27%)	32 (39%)	
Race	Caucasian	28	79	
	Black/African American	6 (5%)	2	
	Asian	1 (1%)	0	
	Hispanic	2 (2%)	0	
BMI	28.6	29.4 [2.9]	28.3 [3.5]	.049

Table 1: Demographic data relative to our patient cohort.

- 116 total patients; 30 (26%) requiring post-activation adjustment
- Cohort was a majority male/Caucasian
- Patients requiring adjustment had significantly higher BMI than those that did not.

Table 2: Multivariate Analysis of Significant Predictors of Post-Activation Adjustment

Variable	Coef (B)	S.E.	Odds Ratio (Exp (B))	95% CI Upper-Lower	P-value
Sleep Latency (min)	-0.075	0.038	0.927	0.861 - 0.999	.046
Nightly Wake-ups	-0.075	0.108	0.928	0.75 - 1.147	.488
Insomnia Severity Index	0.097	0.071	1.102	0.959 - 1.266	.172
Total VOTE Score	1.018	0.412	2.767	1.234 - 6.203	.014
Presence of OP Obstruction	-0.737	0.895	0.478	0.083 - 2.762	.41

Table 2: Results of multivariate analysis looking for predictors of post-activation adjustment

- Decreasing sleep latency was found to be predictive of needing post-activation adjustment
- Increasing total VOTE score on DISE was found to be predictive of needing post-activation adjustment.

Conclusions

- Hypoglossal Nerve Stimulator patients that show early post-activation intolerance of the device requiring in-office adjustment have worse long-term surgical sleep outcomes.
- Patients with higher BMI, more severe obstruction, and lower sleep latency were more likely to present to the office needing post-activation adjustment.