

SUPPLEMENTAL DATA

Supplement Table 1: Results of sleep scoring by full in-laboratory polysomnography with Fz moved to the forehead (PSG) vs scoring from a limited montage consisting of forehead EEG and chin EMG only (two independent scorers LM1 and LM2). Lines 1-3 in the table show the agreement between Full PSG and limited montage sleep scoring. While standard sleep scoring requires only the EEG, HSAT studies are usually scored with all channels visible. Because of this we also investigated the impact of visualizing flow and oximetry while scoring sleep on the HSAT. These results are shown in lines 4-6. The data show that there was little influence of visualizing airflow and oximetry on the agreement with PSG.

AGREEMENT Mean (min-max)	All Epochs (W, N1,N2,N3,R)	Wake vs Sleep (N1,N2,N3,R combined)	Wake/REM/NREM (N1,N2,N3 combined)
LM1 vs PSG	78% (59% - 88%)	92% (70% -97%)	89% (68% - 96%)
LM2 vs PSG	80% (66% - 92%)	95% (81% - 100%)	91% (80% - 97%)
LM1 vs LM2	78% (63% - 88%)	91% (76% - 97%)	88% (76% - 96%)
LM1 + flow vs PSG	80% (68% - 89%)	94% (81%- 99%)	91% (80% - 96%)
LM2 + flow vs PSG	81% (67% - 94%)	95% (87% - 100%)	92% (84% - 99%)
LM1 + flow vs LM2 + flow	79% (61% - 88%)	93% (77% - 99%)	90% (76% -97%)

(Fz) scoring by scorer 1

LM2: Limited montage (Fz) scoring by scorer 2

PSG: Scoring from Full PSG

Supplement Table 2: Cross-tabulations of sleep scoring showing a) limited montage inter-scorer agreement, b) limited montage (scorer 1) vs PSG and c) limited montage (scorer 2) vs PSG.

a)

		LM2									
		Wake	%row	N1	%row	N2	%row	N3	%row	REM	%row
LM1	Wake	4238	91%	293	6%	117	3%	6	0%	19	0%
	N1	605	32%	734	39%	497	26%	2	0%	68	4%
	N2	313	5%	436	6%	5383	78%	451	25%	296	4%
	N3	9	0%	13	1%	352	16%	1850	97%	18	1%
	REM	90	4%	119	6%	198	10%	17	0%	1631	79%

Kappa = 0.70

b)

		LM1									
		Wake	%row	N1	%row	N2	%row	N3	%row	REM	%row
PSG	Wake	3967	93%	168	4%	87	2%	5	0%	17	0%
	N1	769	28%	1024	37%	873	31%	16	1%	94	3%
	N2	219	3%	309	5%	5188	82%	526	45%	60	1%
	N3	10	0%	11	1%	187	9%	1919	97%	17	1%
	REM	134	6%	111	5%	203	9%	17	0%	1845	80%

Kappa = 0.72

c)

		LM2									
		Wake	%row	N1	%row	N2	%row	N3	%row	REM	%row
PSG	Wake	3905	90%	305	7%	56	1%	0	0%	49	1%
	N1	393	16%	1179	49%	677	28%	4	0%	134	6%
	N2	83	1%	593	9%	5324	81%	356	24%	226	3%
	N3	5	0%	11	0%	415	18%	1872	99%	0	0%
	REM	17	1%	111	5%	189	9%	17	0%	1860	85%

Kappa = 0.73

Supplement Table 3: Summary of events, sleep times, and respiratory event indices with and without EEG available to the scorer for a) subjects with complaints of difficulty falling or staying asleep and ESS < 7, and b) subjects with TST ≤ 70% of VST (low sleep efficiency). Delta = HSAT_{EEG} – HSAT_{Polygraphy}.

Table 3a: Subjects with Complaints of Poor Sleep and Low Epworth Score (n=69)			
Results of Scoring HSAT with EEG vs without EEG (Polygraphy)			
AHI4	# Events Mean ± SD	Sleep Time (min) Mean ± SD	AHI4 (events/hr) Median (IQR)
HSAT-EEG	61 ± 78	349 ± 69	5.7 (1.0-14.9)
HSAT-Polygraphy	69 ± 90	447 ± 62	5.0 (0.7-12.8)
Delta	-8.0 ± 2.7	-97 ± 8	0.7
Delta (%)	-12%	-22%	14%
RDI	# Events Mean ± SD	Sleep Time (min) Mean ± SD	RDI (events/hr) Median (IQR)
HSAT-EEG	143 ± 94	349 ± 69	22.4 (13.4-29.7)
HSAT-Polygraphy	172 ± 116	447 ± 62	20.3 (11.6-29.8)
Delta	-29.3 ± 3.8	-97 ± 8	2.1
Delta (%)	-17%	-22%	10%

Table 3b: Subjects with Low Sleep Efficiency on HSAT with EEG (n=38)			
Results of Scoring HSAT with EEG vs without EEG (Polygraphy)			
AHI4	# Events Mean ± SD	Sleep Time (min) Mean ± SD	AHI4 (events/hr) Median (IQR)
HSAT-EEG	72 ± 87	266 ± 74	6.8 (2.6-24.9)
HSAT-Polygraphy	83 ± 102	456 ± 95	4.9 (1.8-16.4)
Delta	-11.2 ± 3.1	-190 ± 10	1.9
Delta (%)	-13%	-42%	39%
RDI	# Events Mean ± SD	Sleep Time (min) Mean ± SD	RDI (events/hr) Median (IQR)
HSAT-EEG	139 ± 99	266 ± 74	24.2 (16.5-48.2)
HSAT-Polygraphy	173 ± 119	456 ± 95	19.5 (10.9-32.3)
Delta	-34.3 ± 4.5	-190 ± 10	4.7
Delta (%)	-20%	-42%	24%

Supplement Table 4: Cross-tabulations of OSA severity defined by AHI4 scoring with and without EEG for a) subjects with complaints of Poor Sleep and low Epworth Score, and b) subjects with low sleep efficiency.

a) Complaint of Poor Sleep and Low Epworth			OSA Severity AHI4 Polygraphy			
			No OSA	Mild	Moderate	Severe
OSA Severity AHI4 EEG	No OSA	Count	31	0	0	0
		% of Row	100.0%	0.0%	0.0%	0.0%
	Mild	Count	3	17	1	0
		% of Row	14.3%	81.0%	4.8%	0.0%
	Moderate	Count	0	2	7	0
		% of Row	0.0%	22.2%	77.8%	0.0%
	Severe	Count	0	0	3	5
		% of Row	0.0%	0.0%	37.5%	62.5%

b) Low Sleep Efficiency			OSA Severity AHI4 Polygraphy			
			No OSA	Mild	Moderate	Severe
OSA Severity AHI4 EEG	No OSA	Count	14	0	0	0
		% of Row	100.0%	0.0%	0.0%	0.0%
	Mild	Count	5	7	0	0
		% of Row	41.7%	58.3%	0.0%	0.0%
	Moderate	Count	0	2	1	0
		% of Row	0.0%	66.7%	33.3%	0.0%
	Severe	Count	0	0	4	5
		% of Row	0.0%	0.0%	44.4%	55.6%