

ARES Sleep Apnea Study Summary Report Data

Patient Name	SamplePatient, TwoNight	Identification Number	9999
Date of Night 1	3/2/06	Date of Birth	5/5/54
Date of Night 2	3/3/06	Study Ordered by	John Doe, MD

Study Conditions and Methods: The patient wore the ARES Unicorder unattended. The Unicorder provides continuous full disclosure recording of oxyhemoglobin saturation and pulse rate (reflectance pulse oximeter), snoring (microphone), head movement and head position (accelerometers), nasal airflow (nasal pressure transducer) and respiratory effort by forehead venous pressure. Automated analysis performed with QC review.

Physician Interpretation, Recommendations and Comments:

The Findings Summary, Desaturation Severity and Treatment Considerations are presented on the second page of this report.

Signature: 

Date: 8/9/2007

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Technical Messages: The study was completed with no technical problems.

FINDINGS

	Entire Study	Night One	Night Two
Valid Recording Time (Hours)	11	5.9	5.1
Apnea/Hypopnea Index using ARES 3% Desaturation Criteria	16	21	10
Number of Abnormal Breathing Events	182	127	55
Total Time in Hours with Abnormal Breathing (Hours)	2.2	1.5	0.7
Apnea/Hypopnea Index using ARES 1% Desaturation Criteria	23	27	18
Number of Abnormal Breathing Events	259	164	95
Total Time in Hours with Abnormal Breathing (Hours)	3.3	2	1.4
Supine AHI using ARES 3% Desaturation Criteria	21	24	16
Supine AHI using ARES 1% Desaturation Criteria	29	31	26
% Time - Supine	73.3 %	86.2 %	58.6 %
Hours - Supine	8	5.1	3
Non-supine AHI using ARES 3% Desaturation Criteria	2	1	3
Non-supine AHI using ARES 1% Desaturation Criteria	7	7	7
% Time - Non-Supine	26.7 %	13.8 %	41.4 %
Hours - Non-Supine	2.9	0.8	2.1
Oxygen Saturation:	Baseline 96.0%	%Time below 90% -	0.7%

Definitions

ARES AHI=Number of Abnormal Breathing Events/Valid Recording Time; Valid Recording Time=Total Recording Time-(Actigraphically Awake Time+Invalid Signal Time)

ARES AHI Severity	ARES AHI Severity	ARES AHI Severity
0-5 Normal	21-40 Moderate	61 and Greater Very Severe
6-20 Mild	41-60 Severe	

Findings Summary: Using the 3% desaturation criteria, the ARES physiologic recording is abnormal. The overall AHI is consistent with mild obstructive sleep apnea/hypopnea. The supine AHI is consistent with moderate obstructive sleep apnea/hypopnea in that position. The No Apparent Risk Level based on the ARES Questionnaire is inconsistent with the recorded 3% AHI severity.

Desaturation Severity: Severe hypoxemia was NOT recorded - the average oxyhemoglobin desaturation with obstructive events was above 85% and the percent time below 90% was less than 10%.

Treatment Consideration: Treatment for symptomatic moderate obstructive sleep apnea can include weight loss and other behavioral measures, a trial of nasal continuous positive airway pressure (CPAP), upper airway surgery, and/or a trial of a mandibular advancing device. Risk factors such as weight and alcohol consumption can affect the severity of obstructive sleep apnea. Future testing should be considered as the patient's risk factors change. If clinically appropriate, the OSA risk avoidance suggestions should be reviewed with the patient.

MD Review: The raw data of this ARES study have been reviewed and the report confirmed by John Doe, M.D., Diplomate, American Board of Sleep Medicine.

OSA Criteria Definitions: Apnea - cessation of airflow for ≥ 10 seconds. All Hypopneas require $\geq 50\%$ change in flow. AHI – 4% Hypopneas require $\geq 3.5\%$ decrease in SpO₂. AHI – 3% Hypopneas require SpO₂ desat/resat ranging from 2.2% to 4% depending on the SpO₂ at the start of the desat. AHI criteria “3% Desat,” “1% Desat” and “0% Desat” require at least one confirmatory arousal indicator based on pulse rate, head movement or snoring sounds.

	Apnea Index	Apnea – Hypopnea Index based on Desat Criteria			
		AHI - 4% Desat	AHI - 3% Desat	AHI - 1% Desat	AHI - 0% Desat
Overall	12	14	16	23	31
Supine	16	19	21	29	39
Non-Supine	1	2	2	7	11

Caution: The diagnosis of the Obstructive Sleep Apnea Syndrome must be based on all available clinical data, of which this study is only a part. Thus final diagnosis and treatment recommendations should include information from an examination of the patient by a knowledgeable physician. Patients with obstructive sleep apnea should be informed of risk avoidance recommendations.

Oxyhemoglobin Saturation (SpO ₂) Data			
Measure	% SpO ₂		
Baseline SpO ₂ (start of recording)	96.0	% Time SpO ₂ Below 95%	43.7
Mean SpO ₂ +/- 1 S.D. SpO ₂	95.1 +/- 1.3	% Time SpO ₂ Below 90%	0.7
Lowest SpO ₂	79.3	% Time SpO ₂ Below 85%	0.1
Mean SpO ₂ at Start of Desaturation Events	96.1	% Time SpO ₂ Below 80%	0.0
Mean Nadir for Desaturation Events	92.5	% Time SpO ₂ Below 75%	0.0
Mean recovery SpO ₂ from Desaturation Events	95.7	% Time SpO ₂ Below 70%	0.0
Percent (%) Time Snoring			
> 30dB = quiet whisper	0.0	> 50dB = loud singing	0.0
> 40dB = normal conversation	0.0	> 60dB = auto at 25 feet	0.0
Pulse Rate			
Mean +/- 1 S.D.	60 +/- 4.9	Max/Min	77 / 50
Pulse Rate Arousal Index (PRAI) – events/hr	51	PRAI – during A/H events	26
ARES Questionnaire Responses and Predicted AHI Severity			
Probability AHI < 5: minimal OSA	39.2%	Height (inches)	72
Probability AHI > 6: at least mild OSA	60.8%	Weight (pounds)	180
Probability AHI > 21: at least moderate OSA	30.8%	High Blood Pressure	Yes
Probability AHI > 41: severe OSA	10.0%	Diabetes	No
Age	53	Heart Disease	No
Sex	Male	Alcohol drinks/week	0
Epworth Sleepiness Scale	12	Caffeinated cup/drinks/day	0
Body Mass Index	24.2	Cigarettes/Day	0
Neck Circumference (inches)	15	Average hours sleep/night	5 to 7
Snoring Frequency	Rarely	Patient Snoring level (0-10)	4
Gasping or Choking	Rarely	Observer snoring level (0-10)	4
Observed to stop breathing during sleep	Rarely	Memory loss (0 – 10)	4

ARES Traceability: Recordings made with Unicorder No. 323 and Firmware v. 02.08.41.05. Data analyzed with ARES Insight v. 3.01.00; InsightAlgorithmCfg; AE; Default; SamplePatient_TwoNight__0001204000027_N1.ASI; SamplePatient_TwoNight__0001204000027_N2.ASI; LongSA;

Analyzed signals snapshots for SamplePatient, TwoNight



