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Initial Sleep Medicine Office Visit Note

Patient: **ROBERT STEHLIN** **DOB:** **Jul 09, 1963**

Attending: Vincent X Grbach, MD
Referring: Julia A Cassetta, MD

Chief Complaint
Follow up post PSG

History of Present Illness
This is a 56 yo WM nurse referred by Dr. Cassetta for evaluation and management of REM sleep behavior disorder (RBD) and mild obstructive sleep apnea (OSA). He underwent nocturnal polysomnography in Keck sleep disorder center on the night of 1/31/2019 and was found to have mild OSA with an obstructive AHI = 5.1 hypopneas/hour of sleep with SpO_2 nadir = 91%. More importantly, he was found to have REM sleep without atonia and observed arm and head movement activity during unequivocal REM sleep. He endorses multiple episodes of dream enactment at home, but says he has never hurt his wife and does not want to take clonazepam or melatonin. He is a long distance runner (30 miles) and healthy food advocate, and would like to forego symptomatic Rx of RBD for now, but agreed that if there was worsening of dream enactment or danger to his wife or self, we would start Rx. He has made the bedroom safe, and there are no weapons nearby. He has read extensively about RBD (including my papers) and would like to investigate the possibility of toxins in his own case. At present there are no signs of Parkinson's disease or other syn-nucleopathy, except he endorses reduced sense of smell. WE discussed all of this at length and also role of future research and what part he might play.

Review of Systems
GENERAL: Negative for chills, fever or night sweats.
EYES: The patient does not wear corrective lenses.

Problem List/Past Medical History
BCC (basal cell carcinoma)
Mild obstructive sleep apnea
REM behavioral disorder

Procedure/Surgical History
- None

Medications
Vitamin B12

DME
No qualifying data available.

Allergies
No Known Medication Allergies

Social History
Alcohol - Denies Alcohol Use, 12/08/2014
Exercise - Regular exercise, 12/08/2014
Home/Environment
Substance Abuse - Denies Substance Abuse, 12/08/2014
Tobacco - Denies Tobacco Use, 12/08/2014
Never smoker, 05/01/2017

Family History
Melanoma: Father and Brother.Negative: Daughter.
Myeloma: Father and Brother.

Microbiology
No qualifying data available.

No qualifying data available.

Diagnostic Results

No qualifying data available.

Negative for blurred vision, eye pain or photophobia.
ENT: Negative for hearing problems, ENT pain, congestion, rhinorrhea, epistaxis, hoarseness or dental problems.
CARDIOVASCULAR: Negative for chest pain, palpitations, tachycardia, orthopnea or edema.
RESPIRATORY: Negative for cough, dyspnea or hemoptysis.
GASTROINTESTINAL: Negative for abdominal pain, heartburn or change in bowel habits.
GENITOURINARY: Negative for genital pain, hematuria or discharge.
NEUROLOGIC: Negative for dizziness, headache, paresthesias or weakness.
PSYCHIATRIC: Negative for anxiety, depression or mania.
ALLERGY ASSESSMENT: Negative for seasonal allergy symptoms, year-round allergy symptoms.

Physical Exam

Vitals & Measurements
T: 36.3 °C (Oral) **HR:** 66(Peripheral) **RR:** 16
BP: 108/68 **SpO2:** 100%
HT: 177 cm **WT:** 70.30 kg **BMI:** 22.44
CONSTITUTIONAL:
Vital Signs: Vital signs associated with this visit reviewed.
General: Thin, wiry and in no apparent distress. Does not appear sleepy on this visit.
EYES:
Eyelids/Sclerae: Eyelids are normal without ptosis. Sclerae are non-injected and non-icteric.
Extra-ocular Muscles: Extra-ocular muscles are intact.
ENT: neg
Neck: Neck has full range of motion. Trachea is midline.
Thyroid: Thyroid is not enlarged.
RESPIRATORY:
Effort: Respiratory effort is quiet and non-labored.
CARDIOVASCULAR:
Cardiac Auscultation: Rate and rhythm are regular. Normal S1 and S2 with no murmur, rub, or gallop heard.
MUSCULOSKELETAL:
Gait/Posture: Gait and/or posture is/are normal.
Muscle Strength/Range of Motion: Full, painless range of motion of all major muscle groups and joints is observed.

NEUROLOGIC:
Level of Consciousness/Orientation: Patient is alert and oriented to person, place and date.
Speech/Language: Speech is fluent. Normal comprehension of the English language.
PSYCHIATRIC:
Mood: Mood is appropriate and cooperative. There are no overt signs of depression or anxiety.
Insight/Judgment: Good insight and good judgment are demonstrated.

Assessment/Plan

IMPRESSION:
1) REM sleep behavior disorder, needs to be watched closely and may need to be Rx'd soon.
2) Mild OSA (5 hypopneas/hr) without Sx's or risk factors; no need for Rx

PLAN:
Observation for now, but will Rx with clonazepam and/or melatonin if dream enactment becomes dangerous.

Richard J. Castriotta, M.D., FCCP, FAASM
Professor of Clinical Medicine
University of Southern California Keck School of Medicine

1. REM behavioral disorder
2. Mild obstructive sleep apnea

Keck Hospital of USC
Sleep Disorders Center
1500 San Pablo Street
Los Angeles, CA 90033
Telephone (323) 442-8459
Fax (323) 865-5624

Keck Medical Center of USC

FULL NIGHT DIAGNOSTIC POLYSOMNOGRAM

Patient Name: STEHLIN, ROBERT
Date of Birth: 7/9/1963
Age: 56
Gender: Male
Height (inches): 5' 10"
Weight (pounds): 155.0 lbs
Neck Size (inches): -
Past Medical History: Chest pain, and basal cell carcinoma

Study Date: 10/31/2019
Medical Record #: 003452461
Account #: 709816417
Referring: Julia Cassetta, MD
Technologist: Eric Young
BMI: (kg/m2): 22.4
Epworth Score: -/24

Medications: None listed.

INDICATIONS

ROBERT STEHLIN is a 56 year old Male who underwent a Full Night Diagnostic Polysomnogram on 10/31/2019 for evaluation of Abnormal Nocturnal Events Prior to this study, the patient has had no prior sleep studies.

STUDY PROTOCOL: Natus XItek SleepWorks® digital polysomnographic recording equipment was utilized to record the following parameters: frontal, central and occipital EEG, electrooculogram (EOG), submentalis EMG, oral airflow, nasal pressure, anterior tibialis EMG, body position and electrocardiogram. Additionally, thoracic and abdominal movements were recorded by respiratory impedance plethysmography. Oxygen saturation (SpO2) was monitored using a pulse oximeter and when applicable end-tidal carbon dioxide (EtCO2) was monitored. The patient was observed and recorded via closed circuit video monitoring throughout the procedure. The study was scored and is reported in strict compliance with the latest version of the AASM Manual for the Scoring of Sleep and Associated Events. The recording was scored using 30 second epochs. The interpretation was performed or supervised by a Board Certified Sleep Medicine specialist. Hypopneas were scored per AASM Rule 1A.

FINDINGS

1. Mild Obstructive Sleep Apnea.
2. REM Sleep Without Atonia. The patient was observed moving both arms and his head during periods of unequivocal REM Sleep. In the setting of dream enactment behavior, this could be consistent with REM Sleep Behavior Disorder.
3. The overall AHI was 5.7/hour.
3. The nadir SaO2 was 91.0%. The average SaO2 was 95.0%. The SaO2 was ≤ 88% for 0 minutes.

RECOMMENDATIONS

1. The patient should have a referral to USC Keck Sleep Disorders Center to discuss Polysomnogram results and their relationship to Sleep symptoms.
2. The patient should have a PAP Titration Polysomnogram in the Sleep Lab for determination of the best PAP device and pressure setting. Alternatively, the patient may be prescribed Auto CPAP set at 4-20cm with close clinical follow up. Finally, the patient may be eligible for non-PAP Therapy for Sleep Apnea.
3. The patient should be counselled to avoid alcohol before bedtime and sedatives.
4. The patient should be counselled to avoid drowsy driving.

Vincent X Grbach, MD
ABIM Board Certified in Sleep Medicine
Assistant Professor, Pulmonary Critical Care and Sleep Medicine
Keck School of Medicine of USC

SLEEP DATA

The study began at 11:25:40 PM. The patient was monitored for a total of 401.1 minutes, out of which the patient slept for 380.0 minutes. Sleep efficiency was 94.7%. Sleep onset occurred at 11:29:19 PM for a sleep onset latency of 3.6 minutes. REM latency was 81.5 minutes. Wake After Sleep Onset (WASO) was 17.5 minutes. The study ended at 06:06:48 AM.

A breakdown of sleep staging reveals the following: Stage N1 69.5 minutes (18.3% of total sleep time), Stage N2 227.5 minutes (59.9% of total sleep time), Stage N3 51.0 minutes (13.4% of total sleep time) and Stage REM 32.0 minutes (8.4% total sleep time).

EEG activity consistent with epileptiform (seizure) was not present.

RESPIRATORY DATA

During the study, there were a total of 4 apnea events observed as follows, 0 obstructive apneas, 4 central apneas, 0 mixed apneas for a total apnea index of 0.6 /hour. There were 32 hypopneas events for an index of 5.1 /hour of sleep. A total of 36 apnea and hypopnea events were observed during the analysis period for an Apnea/Hypopnea index of 5.7 /hour of sleep.

During this time, 15 desaturations occurred during the study. The Oxygen Desaturation Index (ODI) was 2.4/hour. The lowest SpO2 was 91.0%, and the average SpO2 was 95.0%. The lowest SpO2 value during sleep was 91.0%. The duration of SpO2 less than or equal to 88% was 0 minutes.
Snoring was mild.

CARDIAC DATA

The rhythm tracings are remarkable for: normal sinus rhythm .

AROUSAL AND MOVEMENT DATA

A total of 131 arousals were observed during the study as follows; 18 Respiratory Arousals, 0 Leg Movement Arousals, 113 Spontaneous Arousals and 0 Snore Arousals. Overall Arousal Index was 20.7/hour.
There were 0 PLMS with a PLMS Index of 0/hour. There were 0 PLMS associated with arousals with a PLMS Arousal Index of 0/hour.
EMG activity consistent with REM Sleep Without Atonia was present. Video showed parasomnia activity. Consisiting of moving both arms and head during unequivocal REM Sleep.

TECHNICIAN COMMENTS

This patient was referred for a Diagnostic Sleep Study. This patient had mild snoring, and obstructive respiratory events with associated desaturations. There were no other major events noted.

DEFINITIONS

Obstructive Apnea: An Obstructive Apnea is scored when all of the following criteria are met (1) There is a drop in the peak signal excursion by ≥90% of pre-event baseline using an oronasal thermal sensor or PAP device flow, (2) the duration of the ≥90% drop in sensor signal is ≥10 seconds and (3) there is continued or increased inspiratory effort throughout the entire period of absent airflow.

Central Apnea: A Central Apnea is scored when all of the following criteria are met (1) There is a drop in the peak signal excursion by ≥90% of pre-event baseline using an oronasal thermal sensor or PAP device flow, (2) the duration of the ≥90% drop in sensor signal is ≥10 seconds and (3) there is absent inspiratory effort throughout the entire period of absent airflow.

Mixed Apnea: A Mixed Apnea is scored when all of the following criteria are met (1) There is a drop in the peak signal excursion by ≥90% of pre-event baseline using an oronasal thermal sensor or PAP device flow, (2) the duration of the ≥90% drop in sensor signal is ≥10 seconds and (3) there is absent inspiratory effort in the initial portion of the event, followed by resumption of inspiratory effort in the second portion of the event.

Hypopnea: A Hypopnea is scored when all of the following criteria are met: (1) The peak signal excursions drop by ≥30% of pre-event baseline using nasal pressure or PAP device flow, (2) the duration of the ≥30% drop in signal excursion is ≥10 seconds and (3) there is a ≥3% oxygen desaturation from pre-event baseline or the event is associated with an arousal (AASM Rule 1A) or there is a ≥4% oxygen desaturation from pre-event baseline (AASM Rule 1B.)

Hypoventilation: Hypoventilation is scored when either of the following criteria are met: (1) There is an increase in the end-tidal CO2 to a value >55 mmHg for ≥10 minutes or (2) there is ≥10 mmHg increase in end-tidal CO2 in comparison to an awake supine value to a value >50 mmHg for ≥10 minutes.

Tachycardia: Sinus Tachycardia is scored during sleep for a sustained sinus heart rate of greater than 90 beats per minute.

Bradycardia: Bradycardia is scored during sleep for a sustained heart rate of less than 40 beats per minute.

Cheyne-Stokes Breathing: Cheyne-Stokes breathing is scored when both of the following criteria are met: (1) There are episodes of ≥3 consecutive central apneas and/or central hypopneas separated by a crescendo and decrescendo change in breathing amplitude with a cycle length of ≥40 seconds and (2) there are ≥5 central apneas and/or central hypopneas per hour of sleep associated with the crescendo/decrescendo breathing pattern recorded over ≥2 hours of monitoring.

Apnea Hypopnea Index (AHI): Number of Apneas + Number of Hypopneas per Hour of Sleep

Arousal Index (ArI): Number of Arousals per Hour of Sleep

Periodic Limb Movements of Sleep Index (PLMSI): Periodic Limb Movements of Sleep per Hour of Sleep

Periodic Limb Movements of Sleep Arousal Index (PLMSArI): Periodic Limb Movements of Sleep with Arousals per Hour of Sleep

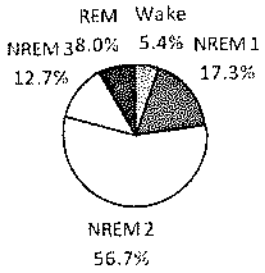
Study Overview

			Count	Index
First Lights Off:	11:25:40 PM	Awakenings:	25	3.9
Last Lights On:	06:06:48 AM	Arousals:	131	20.7
Time in Bed:	401.1 min.	Apneas & Hypopneas:	36	5.7
Total Sleep Time:	380.0 min.	Limb Movements:	-	-
Sleep Efficiency:	94.7%	Snores:	-	-
Sleep Latency:	3.6 min.	Desaturations:	15	2.4
Wake After Sleep Onset:	17.5 min.	Minimum Oxygen during Sleep:	91.0%	
REM Latency from Sleep Onset:	81.5 min.			

Sleep Architecture

Stages	Time (mins)	% Sleep Time
WAKE	21.5	
Stage N1	69.5	18.3%
Stage N2	227.5	59.9%
Stage N3	51.0	13.4%
REM	32.0	8.4%

% of Time in Bed



Arousal Summary

	NREM	REM	Total Sleep Time
Apnea & Hypopnea Arousals	15	3	18
PLM Arousals	-	-	-
Isolated Limb Movement Arousals	-	-	-
Spontaneous Arousals	81	18	99
Total	95	21	116
Arousal Index	16.4	39.4	18.3

Respiratory Summary

	By Sleep Stage		By Body Position		Total
	NREM	REM	Supine	Non-Supine	
Time (min)	348.0	32.0	380.0	-	380.0
Obstructive Apnea	-	-	-	-	-
Mixed Apnea	-	-	-	-	-
Central Apnea	3	1	4	-	4
Total Apneas	3	1	4	-	4
Total Apnea Index	0.5	1.9	0.6	-	0.6
Hypopnea	27	5	32	-	32
Hypopnea Index	4.7	9.4	5.1	-	5.1
Apnea & Hypopnea	30	6	36	-	36
AHI	5.2	11.3	5.7	-	5.7

Respiratory Event Durations

	Apnea		Hypopnea	
	NREM	REM	NREM	REM
Average (seconds)	10.0	10.0	13.9	10.0
Maximum (seconds)	10.0	10.0	31.7	10.0

Oxygen Saturation Summary

	Wake	NREM	REM
Average OSat (%)	95.2%	94.9%	95.3%
Minimum OSat (%)	92.0%	91.0%	93.0%
Maximum OSat (%)	98.0%	98.0%	98.0%

Oxygen Saturation Distribution

Range (%)	Time in range (min)	Time in range (%)
90.0 - 100.0	401.0	100.0%
80.0 - 90.0	-	-
70.0 - 80.0	-	-
0.0 - 70.0	-	-

Time Spent ≤ 88% OSat

Range (%)	Time in range (min)	Time in range (%)
0.0 - 88.0	-	-

Limb Movement Summary

	Count	Index
Isolated Limb Movements	-	-
Periodic Limb Movements (PLMs)	-	-
Total Limb Movements	-	-

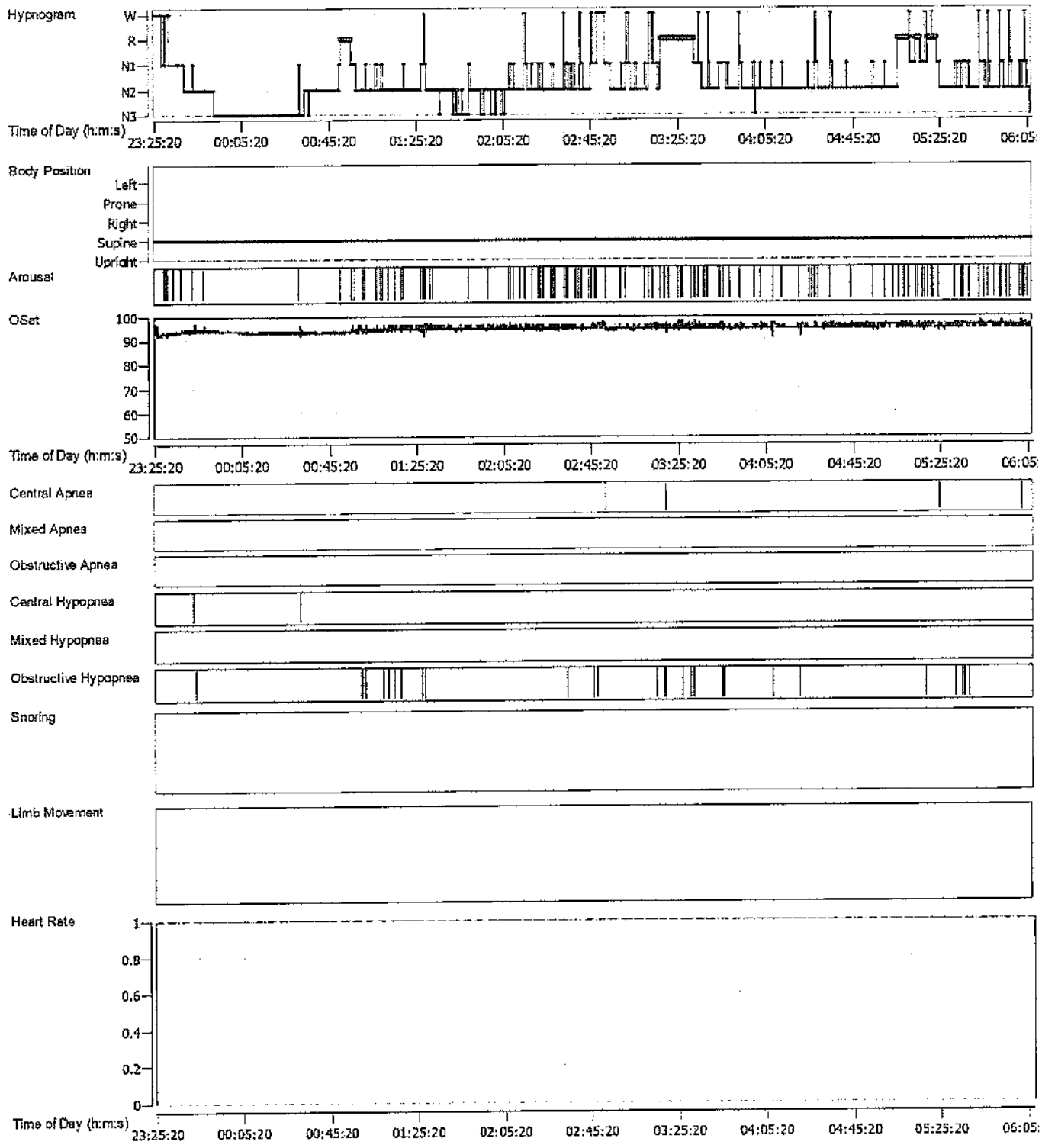
Cardiac Summary

	Wake	NREM	REM	Sleep	Total
Average Pulse Rate (BPM)	-	-	-	-	-
Minimum Pulse Rate (BPM)	-	-	-	-	-
Maximum Pulse Rate (BPM)	-	-	-	-	-

Heart Rate Distribution

Range(bpm)	Time in range (min)	Time in range (%)
0.0 - 40.0	-	-
40.0 - 60.0	-	-
60.0 - 80.0	-	-
80.0 - 100.0	-	-
100.0 - 200.0	-	-

Hypnograms


Hypnogram
W
R
N1
N2
N3
Time of Day (h:m:s)
23:25:20
00:05:20
00:45:20
01:25:20
02:05:20
02:45:20
03:25:20
04:05:20
04:45:20
05:25:20
Body Position
Left
Prone
Right
Supine
Upright
Arousal
OSat
100
90
80
70
60
50
Central Apnea
Mixed Apnea
Obstructive Apnea
Central Hypopnea
Mixed Hypopnea
Obstructive Hypopnea
Snoring
Limb Movement
Heart Rate
1
0.8
0.6
0.4
0.2
0