



**DR. RAJVEER SINGH SAREN**  
Consultant ENT Surgeon (MS ORL-HNS, RPSGT)

Pantai Hospital Klang

“Close follow up and continuous education is necessary for a successful treatment.”

–Dr. Rajveer Singh Saren

## Summary of Clinical studies on Computer assisted Sleep scoring

A study found that inattention errors and bias contribute little, while the vast majority of scoring differences between qualified technologists result from the presence of a large number of equivocal epochs that can legitimately be assigned any of two or even three, sleep stages by competent technologists. These findings suggest that digital identification of key staging variables (e.g., spindles, delta wave duration, objective sleep depth) is needed if inter-scorer variability is to be minimized and that better training or fine-tuning of the scoring guidelines are not likely to be effective.

*Younes M et al. J Clin Sleep Med 2016;12(6):885–894*

Percent agreement between scorers improved dramatically after their scores were independently modified using digitally-obtained information about sleep depth, delta duration, spindles and K complexes. Provision of such information during scoring can greatly reduce interrater variability in sleep staging by eliminating the guesswork in scoring epochs with equivocal features.

*Younes M et al. Accepted 6 June 2016 in J Clin Sleep Med*

Automated analysis of polysomnograms using the Somnolyzer® system provides results that are comparable to manual scoring for commonly used metrics in sleep medicine. While differences exist between manual versus automated scoring for specific sleep stages, the level of agreement between manual and automated scoring is not significantly different than that between any two human scorers. In light of the burden associated with manual scoring, automated scoring platforms provide a viable complement of tools in the diagnostic armamentarium of sleep medicine.

*Punjabi NM et al. Sleep 2015 Oct 1;38(10):1555–66*

The AASM version of the Somnolyzer revealed an agreement between semi-automated and human expert scoring comparable to that published for the R&K version with a validity comparable to that of human experts, but with a reliability close to 1, thereby reducing interrater variability as well as scoring time to a minimum.

*Anderer et al. Neuropsychobiology 2010;62:250–264*

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# Sleep watching

ASEAN SLEEP TECHNOLOGY NEWSLETTER NEWS / OPINIONS / INSIGHTS



**DR. YOTIN CHINVARUN**  
MD, PhD

Vice-president of Epilepsy Society of Thailand, Director of Comprehensive Epilepsy and Sleep Disorder Program, Phramongkutklao Hospital, Director of Sleep club, The Neurological society of Thailand

“Pressure changes are necessary in the majority of patients several weeks after CPAP therapy initiation, therefore re-evaluation of therapy pressure is useful.”

–Dr. Yotin Chinvarun

## Interview with Dr. Yotin Chinvarun on prescribing fixed CPAP

### What are the different ways of finding the right pressure to set on fixed CPAP for OSA patient?

CPAP Titration can be done at home using Auto CPAP (APAP) which is called APAP titration or at the Sleep Laboratory which is called manual titration.

### Do you use auto CPAP for finding the right pressure of fixed CPAP? If yes, what is the trial period for auto CPAP before pressure is set on fixed CPAP?

Yes, we use auto CPAP for finding the right pressure of fixed CPAP, called APAP titration and usually we give a trial period of One week for APAP titration.

### How do you determine the pressure to be set on fixed CPAP based on auto CPAP report?

In my practice I determine fixed CPAP pressure based on auto titration by identifying the minimal effective pressure level (reference pressure). This is referred to as P90(Philips Respironics)/P95(Resmed). I look at P90/P95 after one week trial of Auto CPAP and set P90/P95 as therapy pressure on fixed CPAP. Different devices may utilize different algorithms for monitoring respiratory events.

### Does pressure requirements changes on fixed CPAP for OSA patient over period of time? What is the finding of the recent study in this regard?

Yes, pressure changes are necessary in the majority of patients several weeks after CPAP therapy initiation. Therefore, re-evaluation of therapy pressure is useful.

A prospectively study by Netzer NC et al., 2011, in 905 consecutive patients (740 men and 165 women) with SDB and therapeutic intervention with continuous positive airway pressure (CPAP)/bilevel PAP showed pressure change needed in 511 patients (58.2%). Pressure increase was more frequent than pressure reduction (41.7% vs. 11.7%).<sup>1</sup>

### If patient is unable to tolerate starting fixed CPAP pressure, do you use RAMP function to help him adapt to starting pressure on fixed CPAP?

Yes. The RAMP function on CPAP allows a slow increase in airway pressure from a low setting to the prescribed pressure so that the patient can fall asleep at lower pressures.

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### What is the setting of RAMP pressure and RAMP time? Can respiratory events happen during RAMP time?

In our experience a short RAMP time may be better than a long one. Usually we can set RAMP pressure of 4cmH<sub>2</sub>O and RAMP time will depend upon sleep latency of the patient eg: if he/she takes 15 min to fall asleep, set RAMP time of 15min. In my experience, if patient falls asleep during RAMP time itself, then there is a possibility of respiratory events happening during RAMP time period.

### If patient is unable to tolerate starting fixed CPAP pressure, do you lower the fixed CPAP pressure initially and then gradually increase it towards the therapy pressure to help patient adapt to fixed CPAP pressure?

Yes, if patient is unable to tolerate starting fixed CPAP pressure, we lower the fixed CPAP pressure initially and then gradually increase it towards the therapy pressure to help patient adapt to fixed CPAP pressure.



**MANUEL T. AGAS JR.**  
RMT, RTRP

Medical Technologist, Respiratory Therapist and Sleep Technologist, St Luke's Medical Center – QC (JCIA and Temos Accredited) The first International Academic Medical Center in the Philippines and 64th in the world

“Sleep is the 1/3 of our life that affects the 2/3 of it spontaneously.”

–Manuel T. Agas Jr.

## Personal opinions of Sleep technologist

### Why do you decide to become a sleep technologist?

I did not decide to become a sleep technologist myself, God decided for me to become a Sleep Technologist. I am a Medical Technologist by profession and became a Respiratory Therapist which made me dual license holder. In time, sleep medicine attracted me and made me fall in love with what I am doing. Whenever I see people who are affected by sleep problems, my adrenaline increases and I try to help them. My curiosity in sleep has grown with each passing day as well as my knowledge. This enabled me to promote sleep medicine and at the same time, helping patients suffering from sleep disorder.

Under my influence, my wife, who is a Medical Technologist by profession, also became a Sleep Technologist and now she has been working abroad for more than 10 years.

### What is the most challenging aspect of your profession?

In every profession, every day is a challenging day. However in sleep medicine, the hardest thing to do is to convince patients that snoring is not a sign of deep sleep

### If answer to question-7 is yes, how long do you take to go back to therapy pressure?

I take 2-4 weeks to go back to therapy pressure after lowering the pressure. Eg: let us assume a patient is prescribed a fixed CPAP at 10cmH<sub>2</sub>O and he/she cannot tolerate 10cmH<sub>2</sub>O. I will lower the pressure to 6cmH<sub>2</sub>O and call him after 1 week. If he can tolerate 6cmH<sub>2</sub>O, I will increase pressure by 1cmH<sub>2</sub>O and wait for one more week. The new pressure now is 7cmH<sub>2</sub>O. If he can tolerate 7cmH<sub>2</sub>O, I will increase pressure by 1cmH<sub>2</sub>O (New pressure is 8cmH<sub>2</sub>O) and wait for one week. If he/she can tolerate 8cmH<sub>2</sub>O, I will increase pressure by 1cmH<sub>2</sub>O (new pressure become 9cmH<sub>2</sub>O) and wait for one week. If patient can tolerate 9cmH<sub>2</sub>O, I will increase pressure by 1cmH<sub>2</sub>O (new pressure becomes 10cmH<sub>2</sub>O) and wait for one week for follow up.

References: 1. Netzer NC et al. Sleep Breath (2011) 15:107–112.

but it is a major symptom of Obstructive Sleep Apnea Syndrome (OSAS). It is also difficult to convince patients to undergo a sleep study because of the high costs.

### What is the biggest change in the profession since you began?

Nowadays, CPAP/BiPAP machines keep on changing just like cellular phones. Philips has recently released Dreamstation series of PAP devices, which has a patient driven design and a focus on long term adherence. New generation of PAP devices like BiPAP ASV and AVAPS has been developed and we have to learn new technologies as they are being developed to adopt it for better patient care.

### What factors do you think influence patient adherence to CPAP?

In my opinion, comfort while using the therapy and brand name of PAP devices plays a significant role. Its durability, efficiency and quality follows the cost. So, when a patient learns about the brand of the CPAP/BiPAP machine, then the belief and trust to the product follows. This makes the patient sleep quietly and comfortably.

### What factors tend to influence patient's choice of mask?

In my opinion, you cannot beat comfort with cost. Patients want to sleep better and longer every time they lay on their bed. Philips released a new mask called Dreamwear, nasal CPAP mask. In my experience,

this mask is very comfortable for patients because of its light weight and ease of use.

In my experience, the patients feel very comfortable while wearing Dreamwear mask and they go into REM Sleep more as compared to while wearing other masks.



**DR. DEEPAK SHRIVASTAVA**  
MD, FAASM, FACP, FCCP, RPSGT, University of New York and University of California, Davis

Professor of Medicine, Sleep, Pulmonary and Critical Care, UC Davis School of Medicine

Deepak Shrivastava is a Sleep physician in California. He is devoted to medical education and research. Dr. Shrivastava is board certified in Sleep medicine, pulmonary medicine, Critical Care medicine, Internal medicine and Polysomnography technology.

## RPSGT Exam Corner – In each issue Dr. Deepak Shrivastava will contribute five questions with answers based on RPSGT exam pattern

### 1 All the listed findings are consistent with the stage W in non-alpha generating individuals EXCEPT:

- A. Eye blinks (0.5hz to 2 Hz)
- B. Rapid eye movements associated with normal or high chin muscle tone
- C. Slow rolling eye movements
- D. Reading eye movements

### 2 All the listed findings are consistent with the stage W in non-alpha generating individuals EXCEPT:

- A. Low-amplitude, mixed frequency (LAMP) EEG activity without K complexes or sleep spindles
- B. Low chin EMG tone for the majority of the epoch and concurrent with REMs
- C. Saw tooth waves
- D. Rapid Eye Movements (REMs) at any position within the epoch

### 3 When scoring Periodic Limb Movements in Sleep (PLMS) which of the following is NOT correct:

- A. The minimum amplitude of a limb movement is an 8 uV increase in EMG voltage above resting EMG
- B. The minimum period length between LMs to include them as part of a PLM series is 10 seconds
- C. The maximum duration of a LM event is 10 seconds
- D. Leg movements on 2 different legs separated by less than 5 seconds between movement on set are counted as a single movement

### 4 Following features are necessary to make a diagnosis of REM sleep behaviour disorder EXCEPT:

- A. Sustained muscle activity during REM sleep in the chin EMG
- B. Excessive transient muscle activity during REM in the chin or limb EMG
- C. Excessive transient muscle activity bursts are at least 4 times as high in amplitude as the background EMG activity
- D. Diagnosis of RBD can be made based on polysomnographic findings only

### 5 Which one of the following is recommended maximum signal averaging time of pulse oximetry?

- A. <3 seconds at a heart rate of 80 beats per minute
- B. ≥3 seconds at a heart rate of 80 beats per minute
- C. ≥5 seconds at a heart rate of 80 beats per minute
- D. <0.5 seconds at a heart rate of 80 per minute

ANSWERS: 1. C 2. C 3. B 4. D 5. A

References: 1. Question 1: Page 19, AASM Scoring Manual Version 2.1. 2. Question 2: Page 24 12, AASM Scoring Manual Version 2.1. 3. Question 3: Page 38 A2, AASM Scoring Manual Version 2.1. 4. Question 4: Page 40 F, Note 1. AASM Scoring Manual Version 2.1. 5. Question 5: Page 47 B7, AASM Scoring Manual Version 2.1.

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