

A sleep study measures many different variables during sleep. The aim is to determine the severity and impact of the sleep disorder.

## Your Sleep Specialist Recommendations

A Sleep Specialist is a medical doctor with advanced training in the assessment, diagnosis, and treatment of sleep disorders. Often you will see their title as Respiratory and Sleep Specialist. As well as respiratory issues, they look after all sleep related breathing disorders, such as sleep apnea. They will also see patients with disorders such as narcolepsy, insomnia, circadian rhythm disorders, periodic limb movement disorder/restless legs.

The Sleep Specialists recommendations is a very important section of the sleep study report. This is where they will outline what treatment options and further actions are most suited to your condition. These recommendations will vary for each person and they are outlined in the report for your referring doctor and/or a Sleep Specialist and mySleep staff to discuss with you.

You should feel free to discuss your sleep study results in detail with your GP, book in to see one of our independent Sleep Specialists, or discuss with your mySleep technician, who can help explain any other aspects that may be on your study and are specific to your requirements.

The following information explains some of the terminology found in a Sleep Study report:

SLEEP SUMMARY		
Study Date:	20/07/2020	
Start Time:	11:00pm	
Recording Time:	10.0	hrs
Time in Bed (TIB):	511	mins
Sleep Latency:	28.4	mins
REM Latency:	242.5	mins
Total Sleep Time (TST):	462	mins
Awake Time (WASO):	49	mins
Sleep Efficiency	86	%

## Sleep Quantity

Total Sleep Time (TST), is the amount of time you were asleep during your sleep study. Often, this reading is at odds with your own subjective perception of how much you have slept. You may feel as if you hardly slept a wink, but the report indicates the patient slept for 462min (7.7hrs).

## Sleep Quality

This is a combination of information from different sections of the report; it would require a normal Stage 1 percentage because if a person is continually cycling to Stage 1 that could mean that they are having fragmented sleep, low arousal index which is also an indicator of fragmented sleep, as well as having the recommended 7-9 hours of sleep.

Stage 1:	41.5mins	9 %	[Norm = 1 - 5%]
Stage 2:	254mins	55 %	[Norm = 40 - 55%]
Stage 3:	70.5mins	15%	[Norm - 20 - 35%]
REM:	96mins	21 %	[Norm = 15 - 30%]

## Sleep Efficiency

The ratio between the total sleep time and the recording time, is called the sleep efficiency, this report shows 86% sleep efficiency. People who have significant difficulties in either going to sleep or maintaining sleep have reduced sleep efficiency.

## Sleep Latency

The number of minutes between the time the light is turned out and a person falling asleep is called sleep latency (28.4min on this report). Normally, it should take most people about 10-15 minutes to fall asleep. A significantly shorter Sleep Latency: for example, when you say, 'I fell asleep as soon as my head hit the pillow', might seem desirable, but is an indicator of sleep deprivation.

## REM Latency

Rapid Eye Movement Latency (242.5min) is the time from the sleep onset to the first cycle of REM sleep. In normal sleep, REM sleep cycles every 90 to 120 min intervals throughout the night.

## Awake Time (WASO – Wake After Sleep Onset)

49min is how long this patient was awake after falling asleep before getting up to start the day.

## Arousals & Awakenings

Arousals are interruptions of sleep lasting for a minimum of 3 seconds. They can occur spontaneously or associated to either a respiratory event or limb movement. Each arousal sends you back to a lighter stage of sleep or can wake you up. If the arousal last more than 15 seconds, it then becomes an awakening.

	TOTAL	INDEX
Respiratory Arousals:	44	6/hr
PLM Arousals	-	-/hr
LM Arousals	-	-/hr
Spontaneous Arousals	54	7hr
Spontaneous Arousals Associated with Snore Train	13	1.7/hr
Spontaneous Arousals NOT Associated with Snore Train	13	1.7/hr
<b>TOTAL Arousals:</b>	<b>98</b>	<b>12/7/hr</b>

You are usually not aware of arousals, but you may be aware of awakenings. The number of arousals and awakenings is outlined in the sleep study report and broken down into different types of arousals, such as: Respiratory (6/hour), PLM, LM, Spontaneous (7/hour), Spontaneous with snoring (1.7/hour) and Spontaneous not associated with snoring (5.3/hour).

Finally, it is calculated into a Total Arousals per hour of sleep (12.7/hour). The higher the arousal index, the more tired you are likely to feel, though people vary in their tolerance of sleep disruptions. As few as five arousals per hour can make some people feel chronically sleepy. In the worst cases of Sleep Apnea, the arousal index can be 100 or more per hour.

## Apnea Hypopnea Index (AHI)

Referring in the example to the Respiration Statistics table. The AHI measures the severity of sleep apnea. It is the sum of the number of events (4 types of events in the example below) which includes Obstructive, Central and Mixed events, plus the number of hypopneas (206 listed below) which are periods of shallow breathing that occur, on average, each hour.

## Respiration Statistics:

	NREM			REM			ALL Sleep			Number of events	Average Duration (sec)	Longest Duration (sec)
	Supine	Other	All	Supine	Other	All	Supine	Other	All			
Duration (mins)	305.2	60.8	366	37.3	58.7	96	342.5	119.5				
Apnoea	0.2	2.0	0.5	1.6	0	0.6	0.4	1.0	0.5	4	11.4	12.7
Obstructive	0.2	2.0	0.5	1.6	0	0.6	0.4	1.0	0.5	4	11.4	12.7
Central	0	0	0	0	0	0	0	0	0	0		
Mixed	0	0	0	0	0	0	0	0	0	0		
Hypopnea	22.8	31.6	24.3	54.6	24.5	36.3	26.3	28.1	26.8	206	18.0	36.7
Apnoea + Hypopnoea	23.0	33.5	24.8	56.3	24.5	36.9	26.6	29.1	27.3	210		

**TOTAL Apnoea Hypopnoea Index (normal < 5) 27.3 /hr**

To count in this index the apneas and hypopneas, collectively called events, must have a duration of at least 10 seconds.

The AHI, as with the separate Apnea Index and Hypopnea Index (210), is calculated by dividing the number of events by the number of hours of sleep.

The AHI equals the sum of the number of apneas, plus the number of hypopneas, on average, each hour.

The AHI is calculated by dividing the number of events by the number of hours of sleep. In this example the AHI is 27.3/hour, so this patient has Moderate Sleep Apnea.

AHI	Rating
<5	Normal (no Sleep Apnea)
5 - 15	Mild Sleep Apnea
15 - 30	Moderate Sleep Apnea
>30	Severe Sleep Apnea

## Flow Limitation

Flow limitation can occur during inhalation or exhalation. It refers to any condition which impairs the flow of air through your airway. For example, Inspiratory Flow limitations occur to many individuals that are diagnosed with obstructive sleep apnea. Flow limitation can result from anatomical narrowing of your airway, an obstruction to your airway (such as OSA), or a positional obstruction where the airway is restricted due to an individual's sleep position.

## Oxygen Statistics

During a sleep study a small sensor (pulse oximeter) is worn on one finger. It measures the amount of oxygen in your blood. If this is low, it indicates that there is not sufficient air getting to your lungs to be able to provide oxygen to the rest of your body.

Normal oxygen saturation or Baseline Awake SpO2 is around 95 percent.

The table below shows the drops in blood oxygen levels, known as desaturations. They are measured and categorised depending on REM or non-REM sleep. In this example 83% is the lowest it went, which is moderate desaturation.

## Oxygen Statistics:

Baseline Awake SpO2:	95%	Saturation < 89%	2.8 mins	1%
Average NREM SpO2:	93%	Saturation < 79%	0 mins	0%
Average REM SpO2:	93%	Saturation < 69%	0 mins	0%
Average O2 desaturation Sleep:	4%	<b>Oxygen Desaturation Index: 25 /hr</b>		
Nadir Spo2:	83%			

**Now that you have read about understanding your sleep study results, if you have any questions, please discuss them with your GP, book in to see one of our independent Sleep Specialists, or discuss them with your mySleep technician.**



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