

our sleep technologist who will do a mask fitting trial with different masks and select the most comfortable mask type for the patient. Nasal masks are suitable for most patients. Nasal pillow masks may be preferable for patients with claustrophobia, ocular leaks, narrow/ulcerated nasal bridge, full beards and those who are edentulous. We do our best to avoid using oronasal masks if at all possible.

When do you choose to use Oro-nasal mask to treat OSA patients?

In my opinion, oronasal masks should only be used for those patients with refractory nasal obstruction or mouth leak that is resistant to other interventions.

Do you do follow up of the patient after prescription of the particular type of mask? If yes, how frequently if the follow up done?

We follow patients up 2-4 weeks after the initiation of CPAP. Subsequent follow up intervals range from 1-3 months for those with ongoing issues to 1 year for stable and compliant patients.

What is your advice to doctors and technologists regarding the first time choosing the mask for the patient?

My ENT colleagues would be happy to see me recommend this: Check for nasal resistance and treat any causes of nasal obstruction first! Habitual mouth breathing is often the result of untreated nasal obstruction and OSA and frequently reversible with treatment of the nasal obstruction and CPAP. Try to use nasal masks for most of your patients. For those with special requirements as above, nasal pillow masks may be necessary. If mouth leak persists, chin straps are helpful and cheap and should be tried. As a last resort, oronasal masks can be tried. Preliminary data from one of our research project suggests that patient preference during the initial mask fitting exercise is a poor predictor for final mask preference and best compliance. In other words, regardless of initial patient preference, after being able to try each type of mask for 1 month each, nasal masks are still the most preferred with best compliance, followed by nasal pillow then oronasal mask. *(Unpublished results, personal communication from Dr. Leow)*

References: 1. Borel JC et al. PLoS One 8(5):e64382. 2. Bakker JP et al. Sleep Breath (2012) 16:709-716. 3. Massie et al. Chest 2003 Apr;123(4):1112-8. 4. Ebben MR et al. Sleep Breath. 2016 Mar;20(1):79-85. 5. Knowles SR et al. J Clin Sleep Med 2014;10(4):377-383. 6. Bachour A et al. Mouth closing device (chinstrap) reduces mouth leak during nasal CPAP. Sleep Med 2004.

Sleep matters

ASEAN SLEEP MEDICINE NEWSLETTER NEWS / OPINIONS / INSIGHTS



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"In uncomplicated cases of OSA, use of Auto CPAP will make a CPAP titration study unnecessary for pressure determination allowing for cost saving and making it convenient for patients."

-Adj. Asst. Prof. Sridhar Venkateswaran

Interview with Adj. Asst. Prof. Sridhar Venkateswaran on Choosing the right settings of Auto CPAP

What are the different types of CPAP?

There are two types of CPAP, fixed pressure CPAP and auto adjusting CPAP (auto CPAP for short).

What are the indications of Auto CPAP?

As first line treatment for uncomplicated moderate-severe Obstructive Sleep Apnoea (OSA) as well as Mild Sleep Apnoea with symptoms if the patient is unsuitable for other forms of treatment.

How many pressure settings are there in Auto CPAP?

In my opinion, that depends on the brand of machine, but basically all auto CPAP machines come with a minimum pressure setting, a maximum pressure setting, an optional expiratory pressure relief setting, a ramp setting and if there is an inbuilt humidifier, settings for this. Auto minimum and Auto maximum pressure in Auto CPAP can be set from 4-20cmH2O.

When a new patient diagnosed with OSA uses Auto CPAP for the first time, what are the pressure settings of Auto minimum and Auto maximum?

It partly depends on the physician as well as the patient who might vary with their pressure tolerance, but to be safe (at least initially), I use as wide range as

possible, say a minimum pressure setting of 4cmH2O and a maximum pressure setting of 20cmH2O.

Do you adjust Auto minimum and maximum pressure settings once the patient has used Auto CPAP for some time?

I might make adjustments depending on what the patient tells me. For eg, if they find the maximum pressure is too hard to tolerate and their 90th percentile pressure (Philips Respironics devices)/ 95th percentile pressure (ResMed devices) is lower than the maximum pressure setting, I might lower auto maximum pressure down closer to the 90th/95th percentile pressure depending upon the brand of the machine.

If yes, how long do you wait before you make these adjustments?

I wait about 3 months. It takes time for patients to adjust, hence that duration of time.

What are the criteria for making these adjustments?

In my practice, I look for pressure intolerance, patient

Events in the region and world Oct-Dec 2016

Sleep Down Under, Adelaide Australia www.sleep.org.au/conferences/sleep-downunder-2016	20-22 Oct 2016
Society of Anesthesia and Sleep Medicine (SASM) Annual Conference Chicago US	20-21 Oct 2016
5Th Singapore Paediatric and Perinatal Annual Congress (SiPPAC) www.sippac.sps.org.sg	21-23 Oct 2016
APSR, Bangkok Thailand www.apsresp.org/congress/2016.html	12-15 Nov 2016
OMICS: 2nd International Conference on Sleep Disorders and Medicine Chicago, USA www.sleepmedicine.global-summit.com	28-30 Nov 2016
National Sleep Medicine Course (NSMC), Dehradun India www.issr.in	2-3 Dec 2016

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Sleep matters

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comfort level and presence of snoring before making the above adjustments.

What are the findings of a recent study regarding the range of pressure settings for Auto CPAP?

The study showed people who used either a high pressure span (4-15cmH₂O) or low pressure span (8-12cmH₂O) on their auto PAP machines showed equal efficacy in terms of correction of AHI and symptom control, but the patients with the high pressure span appeared to be less compliant with the treatment.¹

What are the advantages of prescribing auto CPAP over fixed CPAP?

In my experience, Auto CPAP can adjust pressure over variety of situations, eg change in body position, alcohol intake, weight change (within limits), unlike fixed pressure CPAP which may require pressure re-adjustment. Also in uncomplicated cases of OSA, use of Auto CPAP will make a CPAP titration study unnecessary for pressure determination allowing for cost saving and making it convenient for patients.

What is your advice regarding the pressure settings in Auto CPAP while prescribing Auto CPAP to a new OSA patient and regarding the adjustment in pressure

settings once the OSA patient has used Auto CPAP for some time?

As I mentioned earlier, I use a wide pressure range, Auto minimum pressure=4cmH₂O and Auto maximum pressure=20cmH₂O, and if the patient does well on it, I don't usually change it. Of course I still monitor their compliance report at every clinic visit. On the other hand, if the patient finds it difficult to tolerate the pressures at the higher end, I use the 90th/95th percentile pressure, depending upon the brand of the machine on the compliance report as a guide to lower the maximum pressure to somewhere slightly above it.

Taking into consideration the findings of the recent study, another approach can be to start with a wide pressure range, Auto minimum pressure=4cmH₂O and Auto maximum pressure=20cmH₂O.¹ After patient has used the Auto CPAP for some time, we can decrease Auto maximum and increase Auto minimum pressure ±2or3cmH₂O around 90th/95th percentile pressure, depending upon the brand of the machine, to have a better compliance as highlighted by the study in the low span (8-12cmH₂O) group.¹

References: 1. Bastos HN et al. Sleep Breath(2016) 20:183-190.



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“Prevalence of Sleep disorders in Thai children is very high.”

—Dr. Yotin Chinvarun

Summary of Clinical Studies on OSA from Thailand January-June 2016

1 The prevalence of sleep disorders in Thai children who underwent polysomnography at a tertiary-care hospital is very high. In retrospective, analysis of 166 pediatric sleep studies done in a tertiary care hospital in Thailand, OSA was the most common diagnosis with prevalence of 92.2%. the second most common diagnosis was Periodic Limb Movement Disorder with a prevalence of 20.6%.¹

2 Even in tropical climate area, CPAP adherence and quality of life appeared to improve when heated humidification was employed in subjects with moderate to severe OSA with nasopharyngeal symptoms post-split-night polysomnography. In a

prospective randomized cross over study, 20 moderate to severe OSA patients were randomized to receive CPAP with and without humidification and observed for 4 weeks and then crossed over. Information on CPAP adherence, quality of life assessed by the Functional Outcomes of Sleep Questionnaire, nasopharyngeal symptoms assessed by a modified XERO questionnaire, and bedroom ambient humidity and temperature data were obtained.²

3 In 42 OSA induced hypertension patients, the appropriate cutoff points of BMI and neck circumference for Thai STOP-BANG questionnaire were 25kg/m(2) and 36cm.³

4 In a prospective cohort study in Thai pregnant women, pregnant women with a high risk of OSA as assessed by Berlin Questionnaire were at an increased risk of having Pre-Term Delivery, compared with pregnant women with a low risk of OSA.⁴



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“Regardless of initial patient preference, after being able to try each type of mask for 1 month each, nasal masks are still the most preferred with best compliance, followed by nasal pillow then oronasal mask.”

—Dr. Leow Leong Chai

Interview with Dr. Leow Leong Chai on Choosing the right mask for OSA patient

What is the different types of masks?

The 3 most commonly used mask types for OSA are the nasal, nasal pillow and oronasal (also known as full face) masks.

Does the type of mask affect adherence to CPAP therapy?

CPAP interfaces are certainly a significant factor in PAP adherence. Oronasal masks have been consistently shown to be associated with the lowest rates of adherence. Nasal masks seem to perform the best, followed closely by nasal pillow masks.¹

Is there any difference in residual AHI, leak and pressure required to treat OSA if CPAP therapy is delivered via nasal mask, oro-nasal mask or nasal pillows?

For the same patient using a nasal mask, changing to an oronasal mask has been shown to increase residual AHI, leak and pressure requirements, possibly because of reduction in retropalatal and/or retroglossal space due to posterior movement of the mandible caused by the oronasal mask.² There is only one head to head study comparing nasal pillow and nasal masks; efficacy and adverse effects seem to be quite similar.³

Does nasal and oro-nasal mask use during CPAP therapy open the airway to the same extent?

In certain patients, using an oronasal mask seem to be associated with much greater difficulty in achieving the same degree of airway opening compared to a nasal mask. MRI studies done during CPAP showed that this was due to significant posterior displacement of the mandible, epiglottis and tongue base caused by application of CPAP via an oronasal mask.⁴

Is there any difference in the occurrence of side effects like ocular irritation, dry mouth, choking sensation under CPAP or psychological inconvenience when patient uses

References: 1. Veeravigrom M et al. Indian J Pediatr. 2016 May 26. 2. Soudorn C et al. Respir Care. 2016 May 24. 3. Pavarangkul T et al. Neurol Int. 2016 Apr 1;8(1):6104. 4. Na-Rungsri K et al. Sleep Breath. 2016 Apr 8.

nasal mask, oro-nasal mask or nasal pillows?

Among the 3 mask types, oronasal masks are associated with the highest rate of mask related side effects such as ocular irritation, dry mouth, choking sensation under CPAP and psychological inconvenience. For ocular irritation, nasal pillows performed the best, whereas nasal mask performed best in terms of other side effects compared to pillows or oronasal masks.¹

Does use of chin trap in a patient using nasal CPAP and mouth leaks improves adherence to CPAP therapy, residual AHI/leaks and improves daytime function?

There is a surprisingly scant literature on the use of chin straps in PAP treatment. It is well established that mask leak predicts reduced PAP adherence, and small observational studies have shown that taping the mouth shut or using chin strap can reduce mask leak, arousal index and improve sleep architecture.⁶ A larger retrospective study of CPAP users showed that chin strap users had significantly greater PAP adherence, longer nightly duration of PAP use lower residual AHI and lower leak.⁵ I think that a prospective randomized trial of chin straps for patients with persistent mouth leak will be a very interesting study to perform.

How is a mask chosen for the patient in SGH Sleep lab?

In our lab at SGH, before CPAP initiation (preferably before the sleep study itself), nasal resistance should be checked and causes of nasal obstruction such as chronic rhinitis identified and treated. More serious causes of nasal obstruction such as septal deviation or severe polyposis are referred to our ENT department before starting CPAP therapy. Once CPAP is prescribed by the physician, the patient is seen by

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