



## Weighing in on a Heavy Subject

Commentary on Collen et al. Postoperative CPAP use impacts long-term weight loss following bariatric surgery. *J Clin Sleep Med* 2015;11(3):213–217.

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The relationship between obesity and obstructive sleep apnea is a complicated one and is probably bidirectional: obesity increases the severity of obstructive sleep apnea, and obstructive sleep apnea increases the risk of obesity.<sup>1</sup> It is also generally accepted that weight loss decreases the severity of obstructive sleep apnea, although the amount of weight loss required to completely eliminate obstructive sleep apnea isn't known. The effects of treating obstructive sleep apnea on weight loss aren't straightforward. Although it is widely accepted that treating obstructive sleep apnea with CPAP may lead to weight loss, a secondary analysis of data in the APPLES project (a double-blind randomized controlled study comparing sham-CPAP to CPAP on neurocognitive function in patients with newly diagnosed obstructive sleep apnea) demonstrated that the participants assigned to CPAP actually gained weight over the 6-month trial compared to those on sham-CPAP.<sup>2</sup>

The relationship between obstructive sleep apnea and symptoms of sleepiness is also complicated. The Sleep Heart Health Study demonstrates that patients with minimal symptoms of sleepiness can have rather severe obstructive sleep apnea.<sup>3</sup> When does one treat for symptom relief and when does one treat to avoid long-term complications of obstructive sleep apnea (cardiovascular, metabolic, neurocognitive, etc.)? Current generally accepted guidelines suggest that treatment should be offered to symptomatic patients with even mild obstructive sleep apnea. If symptoms are alleviated, treatment should be continued. The same guidelines suggest that treatment should be offered to all patients with moderate to severe obstructive sleep apnea, even in the absence of symptoms, presumably to prevent long-term complications of obstructive sleep apnea.<sup>4</sup> Typically one offers therapy for symptomatic patients with an AHI of 5 or greater and treatment for all with an AHI of 15 or greater. The mean AHI at one year follow-up in the study by Collen et al.<sup>5</sup> is significant and suggests that treatment is warranted, even in the absence of symptoms.

The reasons for adherence (compliance) to CPAP therapy are also multifactorial.<sup>6</sup> Medication adherence has long been a topic of importance, and there are easily hundreds of factors involved including complexity of regimen, patient education, rapport with the patient's health care provider, frequency of follow-up, financial cost of regimen, discomfort or side effects to the regimen, the patient's perceived risk/benefit ratio to

the regimen, the patients perceived symptomatic benefit from therapy, the health-care provider perception of the patient's benefit from therapy, and many others.<sup>7</sup>

As just stated, perceived benefit of therapy by a patient and perceived need for therapy by the health care provider affect therapy adherence, including CPAP. Symptoms of obstructive sleep apnea include sleep fragmentation, non-restorative sleep, daytime fatigue, daytime sleepiness, and depressed mood. Hypertension is more likely to occur in patients with obstructive sleep apnea. Diabetes, when present, is often more difficult to control in patients with comorbid obstructive sleep apnea. Many of these symptoms are also seen in patients with morbid obesity. Although CPAP therapy helps alleviate most of these symptoms, significant weight loss also results in patients experiencing more energy (the caloric/energy cost of the activities of daily living decrease dramatically with significant weight loss), better self-esteem and thus less depressed mood, better control of hypertension, and better control of diabetes. It is thus possible, that two reasons for the drop in CPAP compliance noted in this study after weight loss might include patient perceived improved symptoms after weight loss obviating the need for cumbersome CPAP therapy and the perceived improved symptoms leading health care providers to assume that obstructive sleep apnea had also resolved with weight loss.

The current study clearly showed that CPAP use declined dramatically in selected patients with obstructive sleep apnea after successful weight loss from bariatric surgery, but that obstructive sleep apnea in the range that warrants treatment usually persisted. The authors also demonstrated that lack of therapy for obstructive sleep apnea was associated with significant weight gain over the next 7 years only in those patients who stopped using CPAP.

Because of the complexities between obesity and obstructive sleep apnea, symptoms and obesity, symptoms and obstructive sleep apnea, and factors associated with therapy adherence, this study suggests that sleep medicine follow-up is warranted in all obese patients being treated with CPAP for obstructive sleep apnea and that objective sleep data should be obtained in all patients after weight loss before CPAP is discontinued. Just as one wouldn't consider discontinuing hypertensive medications or diabetic medications after significant weight loss in obese patients without first actually checking blood pressure

or blood glucose, one shouldn't consider the discontinuation of CPAP without an objective assessment of obstructive sleep apnea (sleep study).

I think that this can be generalized to all patients undergoing treatment for obstructive sleep apnea. Some form of objective sleep study is required for all patients with obstructive sleep apnea to assure effectiveness of therapy whether therapy is weight loss, positional, dental appliance, passive nasal positive airway pressure, surgery, positive airway pressure, or ninth cranial nerve stimulation. Current positive airway pressure devices include accurate estimates of the apnea hypopnea index and can provide objective data on the effects of treatment, but for all other therapies, some form of sleep study will be required. The effects of treatment need objective quantification *in addition to* clinical evaluation. It is only by combining objective sleep data with clinical evaluation that an informed treatment decision can be made. If primary care providers are not willing or able to do this, then all such patients should be evaluated and followed by sleep specialists—but the issue shouldn't be ignored.

This is an important study demonstrating that close sleep medicine follow-up is important to prevent the inappropriate discontinuation of CPAP therapy in patients with morbid obesity and obstructive sleep apnea after weight loss. Although obstructive sleep apnea improves, it usually remains clinically significant. CPAP should not be discontinued without object proof that apnea has resolved.

## CITATION

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## SUBMISSION & CORRESPONDENCE INFORMATION

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## DISCLOSURE STATEMENT

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