

Withdrawal of CPAP therapy results in rapid recurrence of OSA

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The benefits of continuous positive airway pressure machines (CPAP) for patients with obstructive sleep apnea (OSA) are quickly reversed when the therapy is withdrawn, according to Swiss research.

The findings appear online in the articles-in-press section of the American Thoracic Society's [American Journal of Respiratory and Critical Care Medicine](#).

"In [patients](#) with obstructive sleep apnea who are established on CPAP treatment, withdrawal of the therapy is associated with a rapid recurrence of OSA and sleepiness within a few days" said Malcolm Kohler, MD, senior consultant at the Sleep Disorders Centre and Pulmonary Division of the University Hospital in Zurich. "After 14 days of CPAP withdrawal, OSA patients experienced considerable increases in [heart rate](#) and blood pressure as well as a deterioration in vascular function."

The researchers recruited patients who had been previously diagnosed with OSA and treated with CPAP and were registered in a database of the Sleep Disorders Centre in Zurich. Patients were randomized to either continue CPAP therapy or to withdraw CPAP (maintaining a sub-therapeutic level) for two weeks. After baseline [polysomnography](#), patients underwent nightly at-home assessment of respiration and [oxygen saturation](#) each day of the study period. Patients were also assessed for subjective and objective sleepiness, psychomotor performance, blood pressure and heart rate, endothelial function (a marker of [vascular](#)

[function](#)), [systemic inflammation](#), [insulin resistance](#) and urinary catecholamines (a marker of [sympathetic nervous system](#) activity.) The polysomnography was repeated at the end of the two-week period.

Not surprisingly, at the end of the study period there was a significant increase in apneic events, oxygen desaturations and the number of arousals during sleep. As a consequence of the recurrence of sleep-disordered breathing, subjective sleepiness increased in the CPAP withdrawal group "Withdrawal of CPAP was associated with a rapid return of sleep-disordered breathing within a few days," said Dr. Kohler.

Importantly, endothelial function deteriorated considerably in the CPAP withdrawal group, and there was a marked increase in blood pressure and heart rate after two weeks. Additionally, the researchers found a significant increase in urinary catecholamines, hormones consistent with sympathetic nervous system activation. These findings imply that withdrawal of CPAP therapy for even a short time has a measurable negative effect on the cardiovascular system.

"We have shown that CPAP withdrawal leads to a return of OSA within the first night off CPAP," said Dr. Kohler. "In addition to strongly suggesting that OSA patients should bring along their CPAP machines on holiday, these findings have implications for OSA research going forward. CPAP withdrawal represents a new way to investigate the physiological effects of OSA and evaluate novel treatments," he explained.

"Many clinical trials involving OSA patients suffer for low recruitment rates of eligible participants. This study points to a simple solution that would circumvent the problem of poor recruitment and could dramatically improve both the quantity and quality of OSA research. Rather than recruiting eligible patients from the sleep laboratory or clinic the proposed approach uses databases including data from a large

number of OSA patients. Thus the required number of eligible patients with specific characteristics can be recruited selectively within a short-time," he went on. "This would allow us to improve the efficacy of randomized controlled trials in this area."

Provided by American Thoracic Society

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