

Sleep apnea devices need filter for use in COVID-19, doctor warns

April 21 2020, by Brita Belli



Dr. Meir Kryger, professor of medicine (pulmonary) at Yale and a colleague at Harvard designed a circuit that can be attached to PAP devices to filter the air both breathed in by and exhaled by patients in order to prevent shedding of the COVID-19 virus. Credit: Yale University

A pair of Yale and Harvard professors have co-designed a circuit device to make machines used by sleep apnea patients safer for use by those infected with the COVID-19 virus.

Many people being treated for sleep apnea use small devices known as positive airway pressure (PAP) [machines](#) to prevent interruption of breathing during the night. But the devices were not designed for patients with a highly contagious virus like COVID-19, said Dr. Meir Kryger, professor of medicine (pulmonary) and clinical professor of nursing at Yale.

In fact, he said, they could be dangerous.

"These machines have a great potential to increase shedding of the virus," Kryger said. "The machine generates a huge airflow, and the [circuits](#) are not designed to filter the air the patient exhales."

When used on a patient with the virus, the existing models could potentially contaminate the room air and increase risk of transmission. However, with the right modification, Kryger said, PAP machines could be used more safely.

He and Harvard colleague Dr. Robert Thomas designed a circuit using off-the-shelf parts that can be attached to PAP devices to filter the air both breathed in by and exhaled by patients. They published their circuit design as a letter in the *Journal of Clinical Sleep Medicine*.

The circuit consists of a non-venting full-face mask, a safety valve, a heat-moisture exchanger or viral filter, and tubing. If needed, a standard adaptor can be attached to allow oxygen or metered inhalers to be added to the circuit. Kryger said that he hopes manufacturers will produce such a circuit, and cautioned that it should only be fitted by an equipment provider or respiratory technician.

As demand for hospital ventilators to treat severe COVID-19 patients continues to rise, PAP machines are also being considered as an alternative to traditional ventilators for less-compromised patients. In

fact, PAP machines have been approved as a bridging [device](#) for COVID-19 patients by the Food and Drug Administration.

But Kryger and Thomas are worried about the many sleep apnea sufferers with PAP machines in their homes who run the risk of infecting loved ones if they become infected with COVID-19. At Yale New Haven Hospital's Sleep Medicine Center, Kryger said they are overseeing treatment for up to 10,000 sleep apnea patients, and 80%-90% of them have a PAP machine in their home.

The two clinician-researchers recently dedicated their monthly professional virtual conference on sleep disorders to the topic of sleep [apnea](#) and COVID-19, which drew an unprecedented 150 people, Kryger said.

"Scientists are collaborating and coming up with solutions much more quickly right now," he said.

More information: Meir Kryger et al. Home PAP devices in COVID-19 infected patients, *Journal of Clinical Sleep Medicine* (2020). [DOI: 10.5664/jcsm.8490](https://doi.org/10.5664/jcsm.8490)

Provided by Yale University

Citation: Sleep apnea devices need filter for use in COVID-19, doctor warns (2020, April 21) retrieved 19 November 2023 from <https://medicalxpress.com/news/2020-04-apnea-devices-filter-covid-doctor.html>

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