

# Researchers develop hands-free device that improves breathing in people with COPD

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One in 10 adults suffer from the debilitating effects of chronic obstructive pulmonary disease (COPD). Research around a new breathing device developed by pulmonologists at the University of

Cincinnati offers promise for improving their lives.

The new device not only improves symptoms of breathlessness and quality of life for people with COPD, it also offers benefits for people dealing with stress and anxiety and those practicing mindfulness, meditation or yoga.

The research was published in the journal *Respiratory Care*.

The device, called PEP Buddy, was created by Muhammad Ahsan Zafar, MD, and Ralph Panos, MD. Zafar is an associate professor in the Department of Pulmonary Critical Care and Sleep Medicine at the UC College of Medicine while Panos is a professor emeritus in pulmonary and [critical care](#) at the UC College of Medicine and is the director of national tele-ICU program for the U.S. Veterans Affairs.

"Dr. Panos and I both see patients with COPD, and it's a huge population," says Zafar. "Their life really changes when they have COPD. They were [active individuals](#) but now they're debilitated and limited, so we wanted to come up with something easy that helps improve their life."

For people with COPD, it takes longer to get inhaled air out of their lungs with each breath due to tighter air tubes. Therefore, when they breathe fast, like during [physical activities](#), air is retained in the lungs. This air stacking or "dynamic hyperinflation" is the main reason for breathlessness and also leads to lower oxygen levels. As the breathing gets difficult during physical activity, people become less and less active and more isolated.

Panos and Zafar developed a hands-free device that is the size of a whistle. Zafar said he looked at positive-expiratory pressure (PEP) breathing devices on the market and they were handheld, big and bulky,

so they tried to come up with something that is very simple, lightweight and easy to use. The device is designed to be worn around the neck with a lanyard for day-to-day use and inserted into the mouth when needed, during or after exertion.

In the study, they examined people with COPD who were short of breath and gave them two tasks. "We conducted a six-minute walk test with and without the device," says Zafar. "They were given the device to take home and use in their daily routines. In two weeks, there was a follow-up to see how PEP Buddy use impacted their shortness of breath and quality-of-life scores."

The study found 72% of the participants had a significant impact in reducing their shortness of breath and improving their quality of life. Among those who would drop their oxygen levels during walking, 36% of them did not drop oxygen levels when using PEP Buddy. This is the first mechanical device to show such an impact on [oxygen levels](#) in people with COPD.

Maja Flannery, a PEP Buddy user with [chronic lung disease](#) and airflow obstruction, says the device has changed her day-to-day living.

"I am so happy that I was lucky enough to be part of the study and able to use this great little device to breathe better," Flannery says. "I use it when I get up in the morning. It helps with the air requirement when changing position from laying down to standing and exercises my lungs to get them more prepared for the day. I find it helpful in getting the trapped air out as I am active, so I can play longer points during tennis, and also recover between points more quickly. My friends at tennis laugh that it is my 'magic whistle.'"

UC's Zafar says the next step in this research is to conduct a long-term study to see the impact on the use of rescue inhalers, emergency

department visits and long-term symptoms and functional capacity in people with COPD. PEP Buddy may also be a promising addition to pulmonary rehabilitation programs for faster improvement and sustaining better outcomes. They are also exploring other uses of PEP Buddy in health care.

"As a physician I feel gratified that we are providing something new that can actually improve people's lives," says Zafar. "That's where my passion is. These people are really debilitated with not many tools in their hand to improve their symptoms right now. PEP Buddy will be one such tool."

**More information:** Muhammad Ahsan Zafar et al, A Hands-Free, Oral Positive Expiratory Pressure Device for Exertional Dyspnea and Desaturation in COPD, *Respiratory Care* (2022). [DOI: 10.4187/respcare.10278](https://doi.org/10.4187/respcare.10278)

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