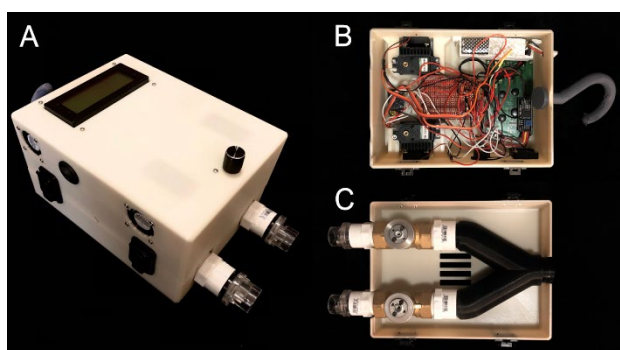


# A Single Customizable and Adaptive Ventilator Device to Treat Multiple Patients



Here we present Eucovent - a novel medical device designed to safely disperse ventilation from a single ventilator to multiple patients. Through incorporation of ball valves operated by a microcontroller, the **Eucovent alternates airflow between each patient through innovative time-multiplexing**. Eucovent splits the breaths delivered temporally, such that the patients are ventilated in an alternating manner. The inspiratory to expiratory (I:E) ratio, a parameter used by ventilator systems, is increased on the ventilator to account for multiple patients. This allows for breaths to be split between patients delivering tidal volumes with precision.

## COMMERCIAL OPPORTUNITY

- Rising cases of chronic obstructive pulmonary disease (COPD) and respiratory emergencies are the major factors driving the global ventilator accessories market growth. According to data published by the World Health Organization (WHO) in 2017, 65 million people suffer from moderate to severe COPD, leading to 3 million deaths. COPD is the third most deadly disease worldwide. Growing cases of bronchitis, asthma, and COPD are due to increases in air pollution levels.
- Eucovent addresses previous shortcomings of co-ventilation devices to create a product for safe and effective use with any patient. Not only can Eucovent address ventilator shortages associated with COVID-19 but can also be used in virtually any setting where ventilator supply is limited. This includes low resource settings, such as those in rural health clinics, military environments, natural disaster scenarios, mass shootings, and future pandemics. Eucovent is a versatile and dynamic device that easily integrates into multiple settings to provide quality patient care.

## TECHNOLOGY

The unique and novel aspect of Eucovent is its employment of temporal multiplexing. This method allows different pressures and volumes to be delivered, because each patient is receiving their own personalized breath. Dynamic control of the device is achieved by use of an Arduino microcontroller, which translates clinician inputs to control the resistance applied within the circuit accordingly. The resistance applied induces a pressure drop from the pressure being delivered from the ventilator to allow for safe delivery of pressures and volumes to the patient for customized breath delivery. This ability allows Eucovent to adapt to ventilation needs as patient conditions worsen or improve. The user interface of the device incorporates a simple dial and LCD screen that allows clinicians to set the pressures desired for each patient, inspiratory to expiratory (I:E) ratio, and start or stop the device. Eucovent can also integrate with any existing ventilator, as the connection only requires standard ventilation tubing. The incorporation of these factors allow Eucovent to stand out from existing co-ventilation devices as a safer, more accurate, and overall better choice for patients.

## PUBLICATION/PATENT

Provisional patent application was filed on 4/16/2021

## AWARDS

- First Prize** - 2021 Design by Biomedical Undergraduate Teams (DEBUT) Challenge - NIH-NIBIB
- First Prize** - 2021 Florida Venture Forum Collegiate Start-Up
- First Prize** - 2021 Jabil Innovation Technology Challenge

## CONTACT

Praba Soundararajan, PhD  
Intellectual Property Manager  
praba.soundararajan@moffitt.org  
813.745.6776

