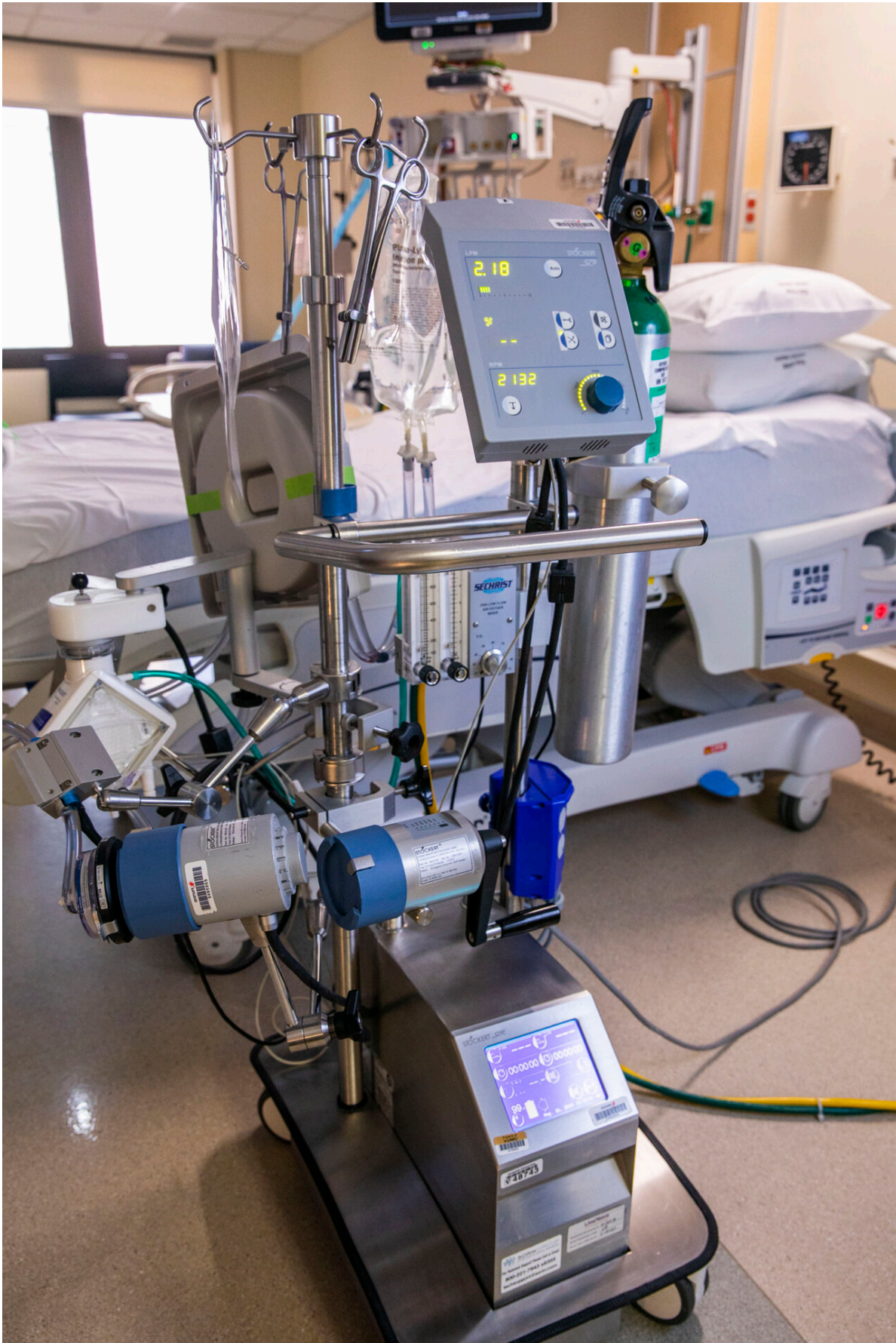


Study shows young, healthy adults died from COVID-19 due to ECMO machine shortage

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Picture of an ECMO Machine which takes over for heart and lungs when one or both fail. Credit: Vanderbilt University Medical Center

Nearly 90 percent of COVID-19 patients who qualified for, but did not receive, ECMO (extracorporeal membrane oxygenation) due to a shortage of resources during the height of the pandemic died in the hospital, despite being young with few other health issues, according to a study published in the *American Journal of Respiratory and Critical Care Medicine*.

The Vanderbilt University Medical Center (VUMC) study, led by Whitney Gannon, MSN, director of Quality and Education for the Vanderbilt Extracorporeal Life Support Program (ECLS), analyzed the total number of patients referred for ECMO in one referral region between Jan. 1, 2021, and Aug. 31, 2021.

Approximately 90% of patients for whom [health](#) system capacity to provide ECMO was unavailable died in the hospital, compared to 43% mortality for patients who received ECMO, despite both groups having young age and limited comorbidities.

"Even when saving ECMO for the youngest, healthiest and sickest patients, we could only provide it to a fraction of patients who qualified for it," Gannon said. "I hope these data encourage hospitals and federal authorities to invest in the capacity to provide ECMO to more patients."

Once a patient was determined to be medically eligible to receive ECMO, a separate assessment was performed of the health system's resources to provide ECMO.

When health system resources—equipment, personnel and intensive care unit beds—were not available, the patient was not transferred to an ECMO center and did not receive ECMO.

Among 240 patients with COVID-19 referred for ECMO, 90 patients (37.5%) were determined to be medically eligible to receive ECMO and were included in the study. The median age was 40 years and 25 (27.8%) were female.

For 35 patients (38.9%), the health system capacity to provide ECMO at a specialized center was available; for 55 patients (61.1%), the health system capacity to provide ECMO at a specialized center was unavailable.

Death before hospital discharge occurred in 15 of the 35 patients (42.9%) who received ECMO, compared with 49 of the 55 patients (89.1%) who did not receive ECMO.

"Throughout the pandemic, it has been challenging for many outside of medicine to see the real-world impact of hospitals being 'strained' or 'overwhelmed,'" said co-author Matthew Semler, MD, assistant professor of Medicine at VUMC. "This article helps make those effects tangible. When the number of patients with COVID-19 exceeds [hospital](#) resources, young, healthy Americans die who otherwise would have lived."

In total, the risk of death for patients who received ECMO at a specialized center was approximately half of those who did not.

"Because some patients die despite receiving ECMO, there has been debate about how much benefit it provides. This study shows the answer is a huge benefit," said senior author Jonathan Casey, MD, assistant professor of Medicine at VUMC.

"This data suggests that, on average, providing ECMO to two patients will save a life and give a young person the potential to live for decades," he said.

More information: Whitney D. Gannon et al, Association Between Availability of ECMO and Mortality in COVID-19 Patients Eligible for ECMO: A Natural Experiment, *American Journal of Respiratory and Critical Care Medicine* (2022). [DOI: 10.1164/rccm.202110-2399LE](https://doi.org/10.1164/rccm.202110-2399LE)

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