

# Large study finds higher burden of acute brain dysfunction for COVID-19 ICU patients

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COVID-19 patients admitted to intensive care in the early months of the pandemic were subject to a significantly higher burden of delirium and

coma than is typically found in patients with acute respiratory failure. Choice of sedative medications and curbs on family visitation played a role in increasing acute brain dysfunction for these patients.

That's according to an international study published Jan. 8 in *The Lancet Respiratory Medicine*, led by researchers at Vanderbilt University Medical Center in coordination with researchers in Spain.

The study, which is far the largest of its kind to date, tracks the incidence of [delirium](#) and coma in 2,088 COVID-19 patients admitted before April 28, 2020, to 69 adult [intensive care](#) units across 14 countries.

ICU delirium is associated with higher medical costs and greater risk of death and long-term ICU-related dementia. Seminal studies at VUMC over the past two decades have spurred widespread interest in ICU delirium research, and the resulting body of evidence has come to inform critical care guidelines endorsed by medical societies in several countries. These guidelines include well calibrated [pain management](#) with prompt discontinuation of analgesics and sedatives, daily spontaneous awakening trials, daily spontaneous breathing trials, delirium assessments throughout the day, early mobility and exercise, and family engagement.

Some 82% of patients in this observational study were comatose for a median of 10 days, and 55% were delirious for a median of three days. Acute brain dysfunction (coma or delirium) lasted for a median of 12 days.

"This is double what is seen in non-COVID ICU patients," said VUMC's Brenda Pun, DNP, RN, co-first author on the study with Rafael Badenes MD, Ph.D., of the University of Valencia in Spain. The authors cite a previous large, multi-site ICU study, also led by VUMC, where acute

brain dysfunction lasted a median of five days, including four days of coma and one day of delirium.

The authors note that COVID-19 disease processes could predispose patient to a higher burden of acute brain dysfunction. But they also note that a number of patient care factors, some of which are related to pressures posed on [health care](#) by the pandemic, also appear to have played a significant role.

The study appears to show a reversion to outmoded critical care practices, including deep sedation, widespread use of benzodiazepine infusions (benzodiazepine is a nervous system depressant), immobilization, and isolation from families. The authors find that, where COVID-19 is concerned, there has been an apparent widespread abandonment of newer clinical protocols that are proven to help ward off the acute brain dysfunction that stalks many critically ill patients.

"It is clear in our findings that many ICUs reverted to sedation practices that are not in line with best practice guidelines," Pun said, "and we're left to speculate on the causes. Many of the hospitals in our sample reported shortages of ICU providers informed about best practices. There were concerns about sedative shortages, and early reports of COVID-19 suggested that the lung dysfunction seen required unique management techniques including deep sedation. In the process, key preventive measures against acute brain dysfunction went somewhat by the boards."

Using electronic health records, investigators were able to closely examine patient characteristics, care practices and findings from clinical assessments. Some 88% of patients tracked in the study were invasively mechanical ventilated at some point during hospitalization, 67% on the day of ICU admission. Patients receiving benzodiazepine sedative infusions were at 59% higher risk of developing delirium. Patients who

received family visitation (in-person or virtual) were at 30% lower risk of delirium.

"There's no reason to think that, since the close of our study, the situation for these patients has changed," said one of the study's senior authors, Pratik Pandharipande, MD, MSCI, professor of Anesthesiology.

"These prolonged periods of acute brain dysfunction are largely avoidable. Our study sounds an alarm: as we enter the second and third waves of COVID-19, ICU teams need above all to return to lighter levels of sedation for these patients, frequent awakening and breathing trials, mobilization and safe in-person or virtual visitation."

**More information:** *The Lancet Respiratory Medicine*, [DOI: 10.1016/S2213-2600\(20\)30552-X](https://doi.org/10.1016/S2213-2600(20)30552-X)

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