

A BETTER WAY TO CARE FOR HEART PATIENTS ON VENTILATORS

Driven to improve treatment for heart patients with breathing problems, researchers at the University of Maryland School of Medicine had an idea: If cardiologists and intensivists teamed up to treat patients who are undergoing mechanical ventilation in the cardiac intensive care unit (CICU), patients might benefit.

When they tested that idea, the results surprised Michael McCurdy, M.D., associate professor of pulmonary and critical care medicine and emergency medicine at the UM School of Medicine. Using resources already available at most hospitals, the new approach freed patients from the ventilator sooner, decreased mortality and let patients leave the hospital earlier, without raising their hospital bills.

In the 15-bed CICU at the University of Maryland Medical Center, “usually a handful” of patients are on a ventilator at any given time, says Gautam Ramani, M.D., assistant professor of medicine at UM School of Medicine and medical director of clinical advanced heart failure and the cardiac ICU. Typically, physicians at medical centers manage their own patients’ care, consulting a specialist only if they feel uneasy about something, want a question answered, or have a specialized need.

However, “we were getting a number of transfers from the cardiac ICU to the medical ICU years ago for difficulty weaning from the ventilator,” notes Dr. McCurdy, an intensivist. “There was room for improvement,” says Dr. Ramani, a cardiologist. Maybe if they joined forces, they could improve outcomes while using patients’ time, and theirs, more effectively.

Right: Dr. Ramani and Dr. McCurdy

Before then, Dr. McCurdy says, “we were operating in a bit of isolation and independently caring for these patients.”

A PARADIGM SHIFT

The researchers thought involving a critical care specialist might help patients, even if the cardiologist or other physician felt comfortable managing the patients’ ventilation and sedation. To find out, Dr. Ramani, Dr. McCurdy and their colleagues conducted an experiment. For one year, they would require a board-certified intensivist

to consult on ventilation and sedation management for every patient receiving mechanical breathing support in the cardiac ICU.

Each morning, medical intensivists rounded on patients with breathing difficulties, discussed them with the cardiology team and drew up treatment plans. “We made various ventilator recommendations on how much air to deliver for how long, when to take the breathing tube out, and sometimes when to put the tube in,” says Dr. McCurdy.

The changes “took a little bit of getting used to,” Dr. Ramani says. Cardiologists who typically managed these ventilator patients now had an intensivist offering additional thoughts, such as different ways to optimize fluid balance on the ventilators, sedate patients and mobilize them. “There are going to be some growing pains along the way with any change,” says Dr. McCurdy. Yet, when physicians started seeing how the new approach benefitted patients, they embraced it.

A WINNING WAY

The researchers’ study, published in the *Journal of the American College of Cardiology* in September 2017, confirmed what they saw in the unit. It tested whether intensivist consultation improves the care of cardiac ICU patients who are receiving mechanical breathing support. Analyses compared 162 such patients who had received care in the year before the intervention with 201 patients treated during the intervention. Throughout the study, cardiac ICU staffing models and practices stayed constant.



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– MICHAEL MCCURDY, M.D.

The results were striking. As Dr. McCurdy put it, "It's one of those rare win-win situations."

Under the collaborative approach, patients spent fewer days on the ventilator. Dr. McCurdy recalls, "We're taking this tube out sooner and, at the same time, we aren't having to put it back in more often." Moreover, patients left the cardiac ICU an average of 2 days sooner. Their average hospital stay decreased from about 20 days to 14.

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Patients also rang up a lower cardiac ICU bill. Those charges fell from an average of \$43,000 to \$30,000, although a statistically significant drop in total hospital charges did not follow.

A SURVIVAL ADVANTAGE

The researchers found only one difference between the two patient groups at baseline: The intervention group actually began the study sicker, as shown by their scores on the Acute Physiology and Chronic Health Evaluation II (APACHE). According to Dr. McCurdy, the baseline APACHE scores correspond to a predicted mortality of 40 percent in the pre-intervention group and 55 percent in the intervention group, making the outcomes "even more dramatic."

Analyses controlling for initial health not only confirmed the benefits already found, but also uncovered a drop in mortality. Before the intervention, 35.2 percent of cardiac ICU patients on ventilators died; after its implementation, 26.4 percent.

In explaining the findings, Dr. Ramani points out that cardiac ICU patients

often have, besides their heart condition, other problems, such as a lung condition or a need for dialysis. The cardiologist says, "When things get complicated, when they have sepsis or they have a bad pneumonia, then I think the care becomes a little bit more complicated, and involving a critical care specialist is very valuable." Dr. McCurdy, for his part, hopes he and his colleagues taught the cardiologists something about ventilator management. "I know that they taught us a lot about various nuances of cardiac management," he says. "It really is a good model."

PUTTING THE RESULTS TO USE

Specifically what about the model improved outcomes remains unclear. Drs. Ramani and McCurdy think that intensivists might be better at fine-tuning ventilator management and tailoring it to patients' needs. That, in turn, may lessen the sedation needed to ease ventilator-related discomfort; it also could enable patients to participate more in their care. The researchers are revisiting the data to test possible explanations for their findings.

Meanwhile, the Medical Center's cardiac ICU plans to continue requiring an intensivist consult for all patients on mechanical ventilation. Dr. McCurdy suggests that other hospitals try the new approach. For small hospitals with no intensivist, tele-intensivists could play a similar role in ICUs, whether they treat cardiac patients or not. "There are data suggesting the benefit of that kind of care as well," he says.

DUALLY TRAINED VERSUS TWO SPECIALISTS

About two thirds of the intensivists in the study trained in critical care and pulmonology; the rest came from a pure critical care background. Nationwide, "there is a very limited number of individuals who are trained and certified

COLLABORATION FOR BETTER CARE

in both cardiology and critical care," but that "probably would be the ideal," Dr. McCurdy says.

Even so, involving intensivists in treating these patients "is a really practical solution for a lot of hospitals that don't have dually trained cardiac intensivists and aren't going to get them any time soon," says Dr. McCurdy. "This collaborative approach involving physicians who have expertise in critical care working together with the cardiologist can really improve outcomes and reduce costs," Dr. Ramani says. In sum, he notes, "We did more with less."

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KEY POINTS

- To improve outcomes, University of Maryland researchers tested a novel collaborative approach to treating mechanically ventilated patients in the cardiac ICU.
- The approach involved mandatory intensivist consults for all such patients.
- A study testing the new approach found that collaboration between intensivists and cardiologists liberated patients from ventilators sooner, got them out of the hospital faster, and decreased mortality.
- Collaboration also lowered cardiac ICU charges.