

Critical care resuscitation unit speeds up transfer of critically ill patients

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A team of surgeons at the University of Maryland Medical Center (UMMC) has developed a program that utilizes its Shock Trauma Center (STC) model to direct critically ill non-trauma patients to the appropriate treatment location and get them into an operating room and hospital intensive care unit (ICU) bed as quickly as possible. Before this program was implemented, its fast intake and treatment strategy had existed only for patients critically injured in automobile crashes or catastrophic events.

After a year with the program in place, transfers of critically ill surgical [patients](#) to the academic medical center almost doubled, increasing about 94 percent, median arrival time was almost cut in half, and median time to surgery was reduced by more than two thirds, according to results the study authors published online in the *Journal of the American College of Surgeons* ahead of print publication.

"The key finding is that creating a process equaled change," said lead investigator Thomas Scalea, MD, physician-in-chief at the R Adams Cowley Shock Trauma Center at UMMC and the Honorable Francis X. Kelly Distinguished Professor of Trauma Surgery at the University of Maryland School of Medicine. "In this particular case, the major variable is time—time to get patients in, time to get patients through the process."

As the population ages and the nature of their illnesses becomes more complex, often involving multiple diseases, the demand for referral

centers like UMMC to handle critically ill patients has increased. Community hospitals seek to transfer their most challenging cases to high-volume centers best equipped to provide specialty urgent care, Dr. Scalea said. The time it takes to get appropriate care can be important when dealing with time-sensitive diseases like stroke, hemorrhage, severe abdominal pain, respiratory failure, and any number of cardiovascular problems, the study pointed out.

"The demand for transfers has gone way up," Dr. Scalea said. "It raises a number of questions, among them, how do you get the transferred patients into your institution? One thing the institution needs is a bed and also a process to get people in."

UMMC provides high-volume specialty services in cardiothoracic, vascular, and emergency general surgery, as well as trauma, neurosurgery, transplant surgery, neurology, and oncology. The R. Adams Cowley Shock Trauma Center, the only freestanding trauma center in the United States, shares the campus with the 801-bed hospital. STC has a total of 155 ICU beds.

In July 2013, UMMC opened the Critical Care Resuscitation Unit (CCRU), a six-bed ICU in the STC with the goal of increasing adult critical care transfers to UMMC and improving outcomes, Dr. Scalea said. An attending intensivist staffs the CCRU around the clock and directs patient throughout assessment and stabilization process. The CCRU staff and subspecialists collaborate to rapidly evaluate and stabilize patients and then transfer them to the unit or operating room that will best serve their needs.

In the year after the CCRU opened, overall transfers increased 64.5 percent, and those of critically ill surgical patients increased 93.6 percent. For patients who needed surgery, median arrival times at the CCRU decreased significantly, from 223 to 118 minutes, as did median

time to surgery, from about 57 hours to about 18.5 hours. Likewise, the median hospital length of stay declined from 17 to 13 days, and even death rates declined from 16.5 percent to 14.6 percent.

"Time is a huge variable," said Dr. Scalea. "There are a number of things—aortic dissection, acute vascular insufficiency, arguably stroke and sepsis—that are all time-related diseases. The clock starts ticking at the time the disease strikes. If you burn the time trying to get the patient to the hospital, you have less time to intervene. The more you can truncate the time, the better patients do."

Before implementing the program, UMMC had been losing admissions of critically ill patients because it did not have available beds in the hospital ICU. "Our ICU beds were full of sick people," Dr. Scalea said. "The referring hospitals, particularly if people are sick, do not want to wait for a bed; they want you to come right away and pick the patient up." So referring hospitals in the UMMC service area would call multiple high-volume institutions and send that critically ill patient to the first center that had a bed available."

The challenge for UMMC was to develop a fast-intake strategy for these [critically ill patients](#) that side stepped the emergency department. "Emergency departments are not good places to use for incoming critically ill transfers," Dr. Scalea said. "It's not what they do well."

The CCRU is a hybrid of sorts, Dr. Scalea said, in that it brings together the rapid evaluation and stabilization of patients that an emergency department performs with the longitudinal care that an ICU offers. UMMC recruited emergency physicians who are fellowship trained in critical care to staff the CCRU "because they have the mindset of rapid evaluation and transfer to the operating room or a different ICU or another appropriate setting where the patient needs to go," Dr. Scalea said.

The concept of the CCRU "was largely surgeon driven," Dr. Scalea said, and representatives of other centers have visited UMMC to learn about the model. "I think that departments of surgery should be very interested in this concept. There was a clear benefit to the department because they performed more vascular, cardiac and emergency general surgery operations." Other key leaders involved in launching the CCRU were James V.O. O'Connor, MD, FACS, FCCP, chief of [critical care](#); Deborah M. Stein, MD, MPH, FACS, FCCM, chief of trauma; Lewis Robinson, MD, PhD, CCRU director; and Stephen Bartlett, MD, FACS, chair of surgery.

More information: The Critical Care Resuscitation Unit: An Innovative Solution to Expedite Transfer of Patients with Time Sensitive Critical Illness. *Journal of the American College of Surgeons*.

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