# For the sickest emergency patients, death risk is lowest at busiest emergency centers

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When a medical emergency strikes, our gut tells us to get to the nearest hospital quickly. But a new study suggests that busier emergency centers may actually give the best chance of surviving – especially for people suffering life-threatening medical crises.

In fact, the analysis finds that patients admitted to a hospital after an emergency had a 10 percent lower chance of dying in the hospital if they initially went to one of the nation's busiest emergency departments, compared with the least busy.

The risk of dying differed even more for patients with potentially fatal, time-sensitive conditions. People with sepsis had a 26 percent lower death rate at the busiest emergency centers compared with the least busy, even after the researchers adjusted for a range of patient and hospital characteristics. For lung failure patients, the difference was 22 percent. Even heart attack death rates differed.

The new findings, based on national data on 17.5 million emergency patients treated at nearly 3,000 hospitals, appear in an *Annals of Emergency Medicine* paper by a University of Michigan Medical School team. Using U-M Department of Emergency Medicine funding, they analyzed data from the Nationwide Inpatient Sample database compiled by the Agency for Healthcare Research and Quality.

The authors calculate that if all emergency patients received the kind of care that the busiest emergency centers give, 24,000 fewer people would

die each year.

"It's too early to say that based on these results, patients and first responders should change their decision about which hospital to choose in an emergency," says Keith Kocher, M.D., MPH, the lead author of the new study and a U-M Health System emergency physician. "But the bottom line is that emergency departments and hospitals perform differently, there really are differences in care and they matter."

This is the first time a relationship has been shown on a national, broad-based scale between the volume of emergency patients seen at a hospital and the chance those patients will survive their hospital stay.

With half of all hospital inpatients now entering via the emergency department, data and lessons from the best-performing hospitals could improve patients' chances of leaving any hospital alive. It could also help guide the development of regional systems for emergency care, and specific measures of emergency care quality that could be used to rate hospitals and spur them to perform better.

## The "practice makes perfect" effect

In addition to survival for all patients admitted to the hospital from the emergency department, Kocher and his colleagues focused on eight high-risk, time-critical conditions. They were: Pneumonia, congestive heart failure, sepsis, the type of heart attack known as an acute myocardial infarction, stroke, respiratory failure, gastrointestinal bleeding and acute respiratory failure.

All require emergency providers to use a certain level of diagnostic skill and technology, and successful treatment depends on the ability of emergency and inpatient teams to deliver specialized treatment. All carry a death risk of at least 3 percent, and rank among the top 25 reasons

emergency patients get admitted to a hospital.

For instance, sepsis, a body-wide crisis sparked by uncontrolled infection, requires careful diagnosis, rapid deployment of antibiotics, blood pressure support and constant monitoring.

The team looked at patients who sought emergency care between 2005 and 2009, and excluded those transferred to another emergency department or hospital, those admitted to observation units, and those seen at hospitals with less than 1,000 emergency patients admitted a year. They looked at deaths during the first two days of hospitalization, and during the entire hospitalization.

The findings mirror surgery studies by U-M teams and others: The higher the volume, or number, of patients a center treats, the better the outcomes – even after adjusting for complicating factors.

Those studies have led to recommendations that patients in need of certain operations should choose to go only to the highest-volume surgeons and hospitals. But emergency patients often don't make a choice in where they get their care – either due to great differences in distance, or the fact that an emergency medical team makes the choice in the ambulance.

So, Kocher says, the survival effect in emergency care may be due to many things – the experience of the diagnosing emergency physicians, the availability of specialists, the skill and staffing levels of emergency and inpatient teams, the technologies available at the hospital, the patients' own health and socioeconomic background, and the location and nature of the hospital. He and his colleagues adjusted for these factors as much as possible before calculating survival rates.

Their results don't give insights into why the differences in survival

occur – but for the first time, they show that they occur, so that further research can probe deeper.

"The take-home message for patients is that you should still call 911 or seek the closest emergency care, because you don't know exactly what you're experiencing," says Kocher, an assistant professor of emergency medicine. "What makes one hospital better than another is still a black box, and emergency medicine is still in its infancy in terms of figuring that out. For those who study and want to improve emergency care, and post-emergency care, we hope these findings will inform the way we identify conditions in the pre-hospital setting, where we send patients, and what we do once they arrive at the emergency department and we admit them to an inpatient bed."

**More information:** Emergency Department Hospitalization Volume and Mortality in the United States, *Annals of Emergency Medicine*, Articles in Press, dx.doi.org/10.1016/j.annemergmed.2014.06.008

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