Medical Xpress

How hospitals can improve outcomes of weekend surgeries

April 25 2015

Studies have shown that patients who undergo surgeries on weekends tend to experience longer hospital stays and higher mortality rates and readmissions.

For the first time, a new study has identified five resources that can help hospitals overcome this "weekend effect": Increased nurse-to bed ratio; full adoption of electronic medical records; inpatient physical rehabilitation; a home-health program; and a pain management program.

"Specific hospital resources can overcome the weekend effect seen in urgent general surgery procedures," senior author Paul Kuo, MD, MS, MBA, first author Anai Kothari, MD, and colleagues reported. The study was released April 25, 2015, in a podium presentation at the American Surgical Association meeting in San Diego.

Several reasons have been proposed to explain the weekend effect, including reduced staffing and resources and fewer experienced doctors and nurses working on weekends.

Loyola researchers hypothesized that boosting hospital resources before, during and after surgery could overcome the weekend effect. They tested their hypothesis in patients undergoing three types of urgent surgeries that could not be delayed until weekdays: appendectomies, hernia repairs and gall bladder removals.

The researchers examined records of 126,666 patients at 117 Florida

hospitals participating in a data base program sponsored by the U.S. Agency for Healthcare Research and Quality. Florida was picked because of its large, diverse population. To determine characteristics of individual hospitals, the patient data were linked to the American Hospital Association Annual Survey database.

Of the 21 hospital resources researchers examined, five were found to help overcome the weekend effect after controlling for patient characteristics:

- Hospitals with increased nurse-to-bed ratios were 1.44 times more likely to overcome the weekend effect. Seventeen hospitals that overcame the weekend effect had a median nurse-to-bed ratio of 1.3, compared with a nurse-to-bed ratio of 1.1 among 41 hospitals with a persistent weekend effect.
- Hospitals with home health programs were 2.37 times more likely to overcome the weekend effect. In such programs, skilled caregivers check on patients after they are discharged, providing wound care, administering medications, etc.
- Hospitals that fully adopted electronic medical records were 4.74 times more likely to overcome the weekend effect.
- Hospitals with inpatient physical rehabilitation programs were 1.03 times more likely to overcome the weekend effect. Such programs identify patients who require additional physical conditioning prior to discharge or need extra resources at home.
- Hospitals with pain management programs were 1.48 times more likely to overcome the weekend effect.

Researchers plan to conduct a follow-up study of hospitals in California, which also has a large, diverse population.

The study was conducted by Loyola's predictive analytics program, which mines large data sets to predict health outcomes. In addition to the

weekend effect study, researchers are studying, for example, how many rectal cancer operations a hospital needs to perform for the best results, and whether having a trauma department confers a beneficial "halo effect" on patient outcomes across the board.

Large new databases, electronic medical records and more powerful computers are enabling researchers to conduct such studies. "We're now able to ask and answer a broad range of questions that could significantly help improve patient care and reduce costs," Dr. Kuo said. Dr. Kuo heads Loyola's analytics group, One to Map Analytics. (One-to-map is a common computer command in analytics research.)

Dr. Kuo is the John P. Igini professor and chair of the Department of Surgery of Loyola University Chicago Stritch School of Medicine.The study is titled, "Components Of Hospital Perioperative Infrastructure Can Overcome The Weekend Effect In Urgent General Surgery Procedures." In addition to Dr. Kuo and Dr. Kothari, other co-authors are Matthew Zapf; Robert Blackwell, MD; Victor Chang; Zhiyong Mi, PhD; and Gopal Gupta, MD.

The complete manuscript of this study and its presentation at the American Surgical Association's 135th Annual Meeting, April 2015, in San Diego, California, is anticipated to be published in the *Annals of Surgery* pending editorial review.

Provided by Loyola University Health System