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Electronic health records improve weekend surgery outcomes

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Electronic health record (EHR) systems significantly improve outcomes for patients who undergo surgeries on weekends, according to a Loyola Medicine study published in *JAMA Surgery*.

Past research has shown that weekend surgery patients tend to experience longer hospital stays and higher mortality rates and readmissions, a phenomenon known as the "weekend effect."

The Loyola study by corresponding author Paul Kuo, MD, MS, MBA, and colleagues identified the components of EHR systems that can help overcome the weekend effect. These elements include electronic systems designed to seamlessly schedule surgeries and move patients into and out of hospital rooms. Patients at hospitals with electronic operating room scheduling were 33 percent less likely to experience the weekend effect than patients at hospitals with paper-based scheduling. At hospitals with electronic bed-management systems, patients were 35 percent less likely to experience the weekend effect.

Loyola University Medical Center was among the earliest hospitals to adopt EHR and Loyola University Health System has reached one of the most advanced stages of implementation, according to HIMSS Analytics, a respected healthcare advisor in information technology.

The Loyola study included 2,979 patients who were admitted during weekends to Florida hospitals for three types of urgent surgeries: appendectomy, acute hernia repair and cholecystectomy (gallbladder

removal). Florida was picked because of its large, diverse population.

Researchers retrospectively examined patient data from the Agency of Healthcare Research and Quality-sponsored Healthcare Cost and Utilization Project State Inpatient Database.

Of the 2,979 weekend surgery patients, 946 (32 percent) experienced the weekend effect, defined as having longer hospital stays than normally would be expected. Patients who did not experience the weekend effect were more likely to be at hospitals with high-speed EHR connectivity, EHR in the operating room, electronic operating room scheduling, computerized physician ordering systems and electronic bed management systems.

A 2015 Loyola study published in *Annals of Surgery* identified five factors that helped hospitals overcome the weekend effect: full adoption of electronic medical records, home health programs, pain management programs, increased registered nurse-to-bed ratios and inpatient physical rehabilitation. In the new study, Loyola researchers followed up by identifying the specific elements of EHR systems that help mitigate the weekend effect.

The research was conducted by Loyola's predictive analytics program, which mines big data to predict health outcomes. 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 is chair of Loyola's department of surgery. He heads Loyola's analytics group, One to Map Analytics. (One-to-map is a common computer command in analytics research.)

The new study, which is published as a research letter in *JAMA Surgery*,

is titled, "Association between elements of electronic health record systems and the weekend effect in urgent general surgery."

First author is Anai Kothari, MD, a surgical resident and a lead investigator in One to Map. Dr. Kothari is an example of how Loyola is training systems-based thinkers of tomorrow. Dr. Kothari also is immediate past chair of Loyola's House Staff Patient Safety Committee and was a member of a national panel that established new work rules for residents.

Provided by Loyola University Health System