Researchers use health data to predict who will use opioids after hospitalization

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Credit: CU Anschutz Medical Campus

Researchers at the University of Colorado Anschutz Medical Campus are working to develop statistical models to better predict which patients will be prescribed opioid medications long-term following discharge from a hospital stay. Opioids are commonly prescribed in the hospital but little is known about which patients will progress to chronic opioid therapy following discharge.

In the U.S. last year, more than 63,000 people died of a drug overdose, with opioids involved in 75 percent of those deaths. According to the 2015 National Survey of Drug Use and Health, over 2 million people in the US had a prescription opioid use disorder.

"Doctors and patients are increasingly aware of the dangers associated with overprescribing of opioids," said Susan Calcaterra, a fellow in addiction medicine at theCU School of Medicine. "We can assist physicians in making informed decisions about opioid prescribing by identifying patient characteristics which put them at risk progressing to chronic opioid use."

The study was published online in the February issue of the *Journal of General Internal Medicine*.

Calcaterra, lead author, said, "Physicians are moving away from using prescription opioids as the primary treatment of chronic, nonmalignant pain. For the hospitalized patient, our ultimate goal is to provide adequate pain control by using a variety of pain management modalities, in addition to, or in place of, opioid medications. In doing so, we may be able to limit the number of patients who progress to long-term opioid use."

Researchers aimed to develop a prediction model to identify hospitalized patients at highest risk of progressing to chronic opioid use following hospital discharge. To develop the prediction model, they accessed data available in the electronic health record from Denver Health Medical Center, an urban, safety net hospital. Researchers defined chronic opioid therapy (COT) as either receiving a 90-day or greater supply of oral opioids with less than a 30-day gap in supply over a 180-day period, or filling ten or more opioid prescriptions over one year.

By accessing electronic health record data, researchers identified patient-specific variables which were highly associated with the progression to COT. These variables included having a history of substance use disorder, past year receipt of a benzodiazepine, an opioid medication or a non-opioid analgesic, receipt of an opioid at hospital discharge and high opioid requirements during hospitalization. Having a surgical procedure during the hospitalization was not associated with progression to COT. The model correctly predicted chronic opioid therapy (COT) in 79% of the patients and no COT correctly in 78% of the patients.

According to the authors, no prediction model has been published to identify hospitalized patients at high-risk of future COT. There are useful prediction tools to assess the patient's risk of opioid misuse including the Screener and Opioid Assessment for Patients with Pain (SOAPP-R) and the Opioid Risk Tool (ORT). However, these tools have not been validated in the hospital setting and they can be too

time-consuming to consistently administer in a busy clinical setting.

"This prediction model could be incorporated into the electronic health record and would activate when a physician orders opioid medication. It would inform the physician of their patient's risk for developing COT and may impact their prescribing practices," Calcaterra said.

She continues: "All of the data required to assess risk are already available in the electronic health record, the physician would not need to input additional information. This tool would be inexpensive to implement and helpful in busy hospital settings where physicians make important health care decisions on patients they may have only met the day before. Researchers plan to validate this model in other health care systems to tests its ability to predict COT in other patient populations."

Similar techniques are already used in medicine to help make predictions using electronic health data, including models that help predict development of diabetes, pancreatitis severity, heart failure readmissions and sepsis.

"Our goal is to manage pain in hospitalized patients, but also to better utilize effective non-opioid medications for pain control," Calcaterra said. "Ultimately, we hope to reduce the morbidity and mortality associated with long-term opioid use."

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